of failure to provide transportation and on request to abandon transportation.

Lois D. Cashell,

Acting Secretary.

[FR Doc. 88-5572 Filed 3-10-88; 11:35 am]

BILLING CODE 6717-01-M

TENNESSEE VALLEY AUTHORITY

(Meeting No. 1400)

TIME AND DATE: 10:00 a.m. (e.s.t.), Wednesday, March 16, 1988.

PLACE: TVA West Tower Auditorium, 400 West Summit Hill Drive, Knoxville, Tennessee.

STATUS: Open.

Action Items

A—Budget and Financing

A1. Adoption of Supplemental Resolution Authorizing 1988 Series A Bonds.

A2. Resolution Authorizing the Chairman and Other Executive Officers to Take Further Action Relating to Issuance and Sale of 1988 Series A Power Bonds.

A3. Retention of Net Power Proceeds and Nonpower Proceeds and Payments to the U.S. Treasury in March 1988, Pursuant to section 26 of the TVA Act.

A4. Modification of the Fiscal Year 1988 Capital Budget Financed from Power Proceeds and Borrowings—(4.1) Upgrade Sewage Treatment Service Capabilities at Sequoyah Nuclear Plant (4.2) Complete Modifications to the Makeup Water Treatment Plant at Sequoyah Nuclear Plant.

A5. Modification of the Fiscal Year 1988 Capital Budget Financed from Power Proceeds and Borrowings—Control Rod Drives Changeout at Browns Ferry Nuclear Plant.

B—Purchase Awards

[1] B1. Negotiation GL-38017B—Low Pressure Turbine Blades for Cumberland Fossil Plant.

B2. Invitation GL-31074B—Tractor-Scrapers for Colbert, Kingston, John Sevier, and Widows Creek fossil plants.

B3. Negotiation GB-06281A—Electrostatic Precipitator Modifications on Johnsville Fossil Plant Units 7 Through 10.

B4. Requisition 64—Long-Term Spot Coal for Shawnee and Widows Creek Steam Plants.

C—Power Items

C1. Letter Agreement Between TVA and Kentucky Utilities Covering Arrangements for Delay in Establishment of the Pineville 500-kV Interconnection Point Provided for Under a 1979 Agreement Between the Parties.

C2. Supplement to Agreement No. TV-70477A with the Nuclear Management and Resources Council, Inc. (NUMARC), Covering Arrangements for Participation in NUMARC, the Chief Speaking Body for the Nuclear Industry on Regulatory Matters before NRC and other Federal Agencies.

C3. Supplement to Agreement No. TV-62776A with the Electric Power Research Institute (EPRI) Covering Arrangements for Participation with other Nuclear Utilities in the Seismicity Owners Group, an Organization Formed to Sponsor and Fund Work toward Investigating Seismic Hazards for Nuclear Electric Generating Plants in the Eastern United States.

D—Personnel Items

D1. Personal Services Contract No. TV-74326A with EG&G Intertech, Inc., Falls Church, Virginia, for Completion of Watts Bar Nuclear Plant Weld Reinspection Program.

E—Real Property Transactions

E1. Modification of Deed to Lakeshore Investors Limited III Affecting 13.3 Acres of Chickamauga Reservoir Land Located in Hamilton County, Tennessee, to Allow the Conversion of 121 Apartment Units to Condominiums—Tract No. XCR-444.

E2. Grant of Permanent Easement to Reed Crushed Stone Company, Inc., Affecting Approximately 0.9 Acre of Kentucky Reservoir Land Located In Livingston County, Kentucky to Provide Suitable Access for an Office Complex—Tract No. XGIR.913H.

E3. Sale of Noncommercial, Nonexclusive Permanent Recreation Easement to Bob E. Oxendine, Affecting a Total of 0.08 Acre of Tellico Reservoir Shoreline Located in Monroe County, Tennessee, for the Construction of Private Water Use Facilities—Tract No. XTELR-57RE.

E4. Filing of Condemnation Cases

F—Unclassified

F1. Supplement No. 7 to Agreement No. TV-61962A with Tennessee State University, Nashville State Technical Institute, and the State of Tennessee Board of Regents for Coordination and Administration of the Craft/Skill Upgrade Training Program at the Industrial Training Center at Cockrill Bend in Nashville, Tennessee.

F2. Supplement No. 4 to Contract No. TV-67766A with Tennessee State University for TVA to Assist the University in Administering the Craft/Skill Upgrade Training Program at the Industrial Training Center of the Nashville Project.

F3. Supplement No. 1 to Subagreement No. 21 to Memorandum of Agreement No. TV-23928A between TVA and the U.S. Department of the Army, Corps of Engineers, Covering Arrangements for Improvements to Navigation Facilities on the Tennessee River.

F4. Contract No. TV-73494A with the Swedish Society for Ethanol Development Covering Arrangements for TVA to Make its Specialized Services Available to Conduct Tests Related to Production of Ethanol and Other Chemicals from Biomass.

F5. New Investment Management Agreements Between the Tennessee Valley Authority Retirement System and Seven Investment Managers (Disciplined Investment Advisors, Inc.; Sun Bank, N.A.; Geewax, Terker & Company; Morgan Grenfell Capital Management, Inc.; Pacific Investment Management Company; Duff & Phelps Investment Management Company; and W.R. Huff Asset Management Company).

CONTACT PERSON FOR MORE INFORMATION: Alan Carmichael, Director of Information, or a member of his staff can respond to requests for information about this meeting. Call (615) 632-8000, Knoxville, Tennessee. Information is also available at TVA's Washington Office (202) 245-0101.

Dated: March 9, 1988.

W.F. Willis,

General Manager.

[FR Doc. 88-5564 Filed 3-10-88; 11:01 am]

BILLING CODE 8120-01-M

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[1] This item approved by individual Board members. This would give formal ratification to the Board's action.

Corrections

Federal Register
Vol. 53, No. 49
Monday, March 14, 1988

This section of the FEDERAL REGISTER contains editorial corrections of previously published Presidential, Rule, Proposed Rule, and Notice documents and volumes of the Code of Federal Regulations. These corrections are prepared by the Office of the Federal Register. Agency prepared corrections are issued as signed documents and appear in the appropriate document categories elsewhere in the issue.

DEPARTMENT OF AGRICULTURE

Animal and Plant Health Inspection Service

9 CFR Part 92

[Docket No. 88-009]

Importation of Sheep

Correction

In proposed rule document 88-4395 beginning on page 6656 in the issue of Wednesday, March 2, 1988, make the following corrections:

1. On page 6659, in the second column, in the fourth complete paragraph, in the second line, after "States", insert "unless".

§ 92.44 [Corrected]

2. On page 6663, in the first column, in § 92.44(a)(5), before the first "The", insert "If".

BILLING CODE 1505-01-D

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

21 CFR Part 182

[Docket No. 81N-0314]

Sulfiting Agents; Proposal To Revoke GRAS Status for Use on "Fresh" Potatoes Served or Sold Unpackaged and Unlabeled to Consumers; Extension of Comment Period

Correction

In proposed rule document 88-3181 appearing on page 4184 in the issue of Friday, February 12, 1988, make the following correction:

In the subject heading, in the third line, "Unpackaged" was misspelled.

BILLING CODE 1505-01-D

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

[Docket No. 78N-0434]

Mattox & Moore, Inc., Esmopal; Opportunity for Hearing

Correction

In notice document 88-2997 beginning on page 4214 in the issue of Friday, February 12, 1988, make the following corrections:

1. On page 4216, in the second column, in the first complete paragraph, in the third line, after "that", insert "it".

2. On page 4217, in the first column, in the first complete paragraph, in the 10th line, "dose" should read 'does".

3. On the same page, in the second column, in the 30th line, "505" should read "512".

4. On page 4218, in the first column, in the first complete paragraph, in the third line from the bottom, "level" should read "levels".

BILLING CODE 1505-01-D

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

Advisory Committees; Meetings

Correction

In notice document 88-3327 beginning on page 4724 in the issue of Wednesday, February 17, 1988, make the following correction:

On page 4724, in the second column, under *Type of meeting and contact person*, in the last line, the phone number should read "419-259-6211".

BILLING CODE 1505-01-D

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[AZ-940-08-4212-12; A-18416-D and A-20242-D]

Reconveyed Land Opened to Entry; Apache County, Arizona

Correction

In notice document 87-28305 appearing on page 46847 in the issue of Thursday, December 10, 1987, make the following correction:

In the first column, in the **DATE** line, "March 9, 1987" should read "March 9, 1988".

BILLING CODE 1505-01-D

OFFICE OF PERSONNEL MANAGEMENT

5 CFR Part 630

Absence and Leave; Temporary Leave Transfer Program

Correction

In rule document 88-5118 beginning on page 7325 in the issue of Tuesday, March 8, 1988, make the following correction:

On page 7326, in the first column, under "**Authority**", in the fourth line, "12228" should read "11228".

BILLING CODE 1505-01-D

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 71

[Airspace Docket No. 87-AGL-26]

Alteration to Control Zone and Transition Area, Monroe County Airport, Bloomington, IN

Correction

In rule document 88-2988 beginning on page 4118 in the issue of Friday,

February 12, 1988, make the following correction:

§ 71.171 [Corrected]

In § 71.171, on page 4119, in the second line, "VORTAC; 236" should read "VORTAC 236".

BILLING CODE 1505-01-D

DEPARTMENT OF THE TREASURY

Internal Revenue Service

26 CFR Part 1

[T.D. 8186]

Income Tax, Taxable Years Beginning After December 31, 1953; Election To Be Taxed as a Real Estate Mortgage Investment Conduit and Other Administrative Matters; and OMB Control Numbers Under the Paperwork Reduction Act

Correction

In rule document 88-5127 beginning on page 7504 in the issue of Wednesday, March 9, 1988, make the following correction:

PART 1——[CORRECTED]

On page 7507, in the second column, under **Authority**, in the fifth line, "27 U.S.C." should read "26 U.S.C.".

BILLING CODE 1505-01-D

DEPARTMENT OF THE TREASURY

Internal Revenue Service

26 CFR Part 1

[T.D. 8179]

Organizations Under Common Control; Eighty Percent Control Test for a Brother-Sister Controlled Group

Correction

In rule document 88-4238 beginning on page 6603 in the issue of Wednesday, March 2, 1988, make the following corrections:

§ 1.52-1 [Corrected]

1. On page 6605, in the second column, in § 1.52-1(h)(2)(i), in the third line, "is" should read "it".

§ 1.414(c)-3 [Corrected]

2. On page 6608, in the third column, in § 1.414(c)-3(d)(6)(i), in the seventh line, "with" should read "which".

3. On page 6609, in the first column, in § 1.414(c)-3(e), Example (1), in the 11th line, "and ABC" should read "of ABC".

§ 1.414(c)-4 [Corrected]

4. On page 6610, in the second column, in § 1.414(c)-4(b)(3)(ii)(A), in the 12th line, "decedent's" was misspelled.

5. On page 6611, in the first column, in § 1.414(c)-4(b)(6)(ii), in the second line, the first "In" should read "If".

§ 1.1563-1 [Corrected]

6. On page 6612, in the second column, in § 1.1563-1(a)(3)(ii), Example (3), in the first complete paragraph, in the seventh line, insert "of" after "stock".

BILLING CODE 1505-01-D

DEPARTMENT OF THE TREASURY

Internal Revenue Service

26 CFR Part 48

[T.D. 8181]

Manufacturers and Retailers Excise Taxes; Election to Have Certain Diesel Fuel Taxes Imposed on Sales to Retailers; and OMB Control Numbers Under the Paperwork Reduction Act

Correction

In rule document 88-4373 beginning on page 6518 in the issue of Tuesday, March 1, 1988, make the following correction:

§ 48.4041-21T [Corrected]

On page 6521, in the second column, in § 48.4041-21T(h)(2), under "**SELLER'S CONSENT TO LIABILITY**", in the second paragraph, in the last line, "thereof" should read "therefor".

BILLING CODE 1505-01-D

federal register

Monday
March 14, 1988

Part II

Department of Energy

Office of Conservation and Renewable Energy

10 CFR Part 430

Energy Conservation Program for Consumer Products; Final Rulemaking Regarding Test Procedures for Central Air Conditioners, Including Heat Pumps

DEPARTMENT OF ENERGY

Office of Conservation and Renewable Energy

10 CFR Part 430

[Docket No. CAS-RM-79-102]

Energy Conservation Program for Consumer Products; Final Rulemaking Regarding Test Procedures for Central Air Conditioners, Including Heat Pumps

AGENCY: Office of Conservation and Renewable Energy, DOE.

ACTION: Final rule.

SUMMARY: The Department of Energy (DOE) hereby amends the test procedures for central air conditioners, including heat pumps. Test procedures are one part of the energy conservation program for consumer products established pursuant to the Energy Policy and Conservation Act, as amended by the National Energy Conservation Policy Act (NECPA) and the National Appliance Energy Conservation Act (NAECA). Among other program elements, the legislation requires that standard methods of testing be prescribed for covered products.

The purpose of today's notice is to improve and refine the test procedure for central air conditions, including heat pumps. Specifically, DOE is expanding the coverage of the test procedures to address innovative designs, including split-type ductless systems and variable-speed central air conditioners.

EFFECTIVE DATE: September 12, 1988.

FOR FURTHER INFORMATION CONTACT:

Douglass S. Abramson, U.S. Department of Energy, Office of Conservation and Renewable Energy, Forrestal Building, Mail Station, CE-132, 1000 Independence Avenue SW., Washington, DC 20585, (202) 586-9127

Eugene Margolis, Esq., U.S. Department of Energy, Office of General Counsel, Forrestal Building, Mail Station, GC-12, 1000 Independence Avenue SW., Washington, DC 20585, (202) 586-9507.

SUPPLEMENTARY INFORMATION:

a. Background

The energy conservation program for consumer products was established pursuant to Title II, Part B of the Energy Policy and Conservation Act (EPCA) (Pub. L. 94-163). Subsequently, EPCA was amended by the National Energy Conservation Policy Act (NECPA) (Pub. L. 95-619), and the National Appliance Energy Conservation Act of 1987 (NAECA) (Pub. L. 100-12). Among other program elements, section 323 of the EPCA, as amended, requires that standard methods of testing be prescribed for covered products, including central air conditioners and heat pumps. Test procedures appear at 10 CFR Part 430, Subpart B.

Test procedures for evaluating the cooling performance of air-source central air conditioners were issued initially by DOE on November 21, 1977. 42 FR 60150, November 27, 1977. Test procedures for evaluating the heating performance of air-source heat pumps as well as amendments to the test procedures for central air conditioners were issued by DOE on December 10, 1979. 44 FR 76700, December 27, 1979. On March 15, 1985, DOE issued a Notice of Inquiry to solicit comments concerning a rating method for determining efficiency ratings for untested combinations of split-system central air conditioners in lieu of laboratory testing of such units. 50 FR 13042, April 2, 1985. DOE published a proposed rule on October 3, 1986, 51 FR 35736, and held a public hearing November 12, 1986. To encourage broad participation in the rulemaking proceeding, DOE extended the comment period to January 30, 1987. 51 FR 40442, November 7, 1986.

Today's rulemaking expands the coverage of the test procedures to address innovative designs, including split-type ductless systems and variable-speed central air conditioners. It also prescribes additional requirements for alternative rating methods for estimating efficiency ratings for untested combinations of split-system central air conditioners in lieu of laboratory testing, by defining the meaning of a coil family and establishing a requirement for test data to support the results.

In 1981, DOE's Office of Hearings and Appeals (OHA) granted an exception authorizing a change in the test procedure to York Division Unitary Products (York) for its variable-speed heat pump. Federal Energy Guidelines, 7 DOE No. 81,209. In 1983, OHA extended the exception to Borg-Warner Central Environmental Systems (Borg-Warner), formerly York. Federal Energy Guidelines, 10 DOE No. 81,026. The two exceptions specify an alternative test procedure for evaluating variable-speed heat pumps. In 1986, the Carrier Corporation (Carrier) petitioned the Department for a test procedure waiver for its variable-speed heat pump. 51 FR 5587, February 14, 1986. DOE granted Carrier's petition on September 19, 1986, approving an alternative test procedure different from the Borg-Warner approach. 51 FR 35403, October 3, 1986. The Department also granted a waiver to the Trane Company for variable-speed heat pumps on March 26, 1987. 52 FR 11855, April 13, 1987. Today's rule establishes a test procedure for variable-speed heat pumps reflecting the methods used in the waivers granted to Carrier and Trane. The exceptions to Borg-Warner and York and waivers granted to Carrier and Trane by DOE will terminate on the effective date of today's rule.

b. Discussion of Comments

In response to the October 1986 proposal, DOE received comments from manufacturers, utility companies, a trade association, and interested individuals. The major issues raised by the comments are discussed below:

1. Continuous Air Test Method

The continuous air test method was proposed by DOE to replace the current damper test method. The continuous air test method eliminates the need for dampers and measures the efficiency of equipment while the fan moves air continuously across the indoor coils. The continuous air test method is based on American National Standards Institute/American Society of Heating Refrigerating and Air Conditioning Engineers (ANSI/ASHRAE) Standard 116-1983 and Air Conditioning and Refrigeration Institute (ARI) Standard 210/240-84.

Eleven manufacturers and an industry trade association, the Air Conditioning and Refrigeration Institute (ARI), addressed the issue of the continuous air test method.

Manufacturers agreed that the continuous air method would be a benefit, provided that DOE address certain concerns or problems. The manufacturers' primary concern was that the values for Seasonal Energy Efficiency Ratio (SEER) or Heating Seasonal Performance Factor (HSPF) rating for existing models of central air conditioners should remain unchanged. This would eliminate the requirement to retest and rerate all equipment. (York, No. 28, at 1; Bard, No. 31, at 1; IEC, No. 32, at 1; ARI, No. 39, at 2; Snyder General, No. 41, at 2; Carrier, No. 40, at 4) [1]. DOE's proposal would have established the continuous air test method with a six-minute compressor "on" time and a six-minute capacity integration time. (Hereafter referred to as the six- and six-method). The capacity integration time is the interval

[1] Comments on the proposal were given docket numbers and are numbered consecutively, beginning with No. 24. Comments presented at the November 12, 1986, public hearing are identified as Testimony.

during which the cooling or heating capability of the air conditioner or heat pump is measured. However, the ARI Standard 210/240–84 requires a six-minute compressor "on" time with an eight-minute capacity integration time (Hereafter referred to as the six- and eight-method). Nine manufacturers protested the use of a continuous air method with the DOE six- and six-method, recommending the ARI six- and eight-method. (Addision, No. 43, at 2; Lennox, No. 35, at 2; Rheem, No. 29, at 2; ARI, No. 39, at 2; Synder General, No. 41, at 2; IEC, No. 32, at 2; Heil Quaker, No. 34, at 2). York commented that the continuous air method with a six- and six-method showed an average 3.8 percent lower SEER rating than the rating achieved with the current damper method. When using a six- and eight-method the SEER value is 1.85 percent higher than the damper method. (York, No. 28, at 3).

Two commenters considered the additional expense of retrofitting test facilities to conform to the continuous air test method and testing models in accordance with the proposed test procedure to be excessive and burdensome. (Trane, No. 26, at 5; Addison, No. 43, at 2). These commenters also argued that the need or requirement to retest old models would add expense and impact negatively on manufacturer research and development.

Also bearing on this issue are the provisions of the National Appliance Energy Conservation Act (NAECA) of 1987, which require DOE to revise appropriately the energy conservation standard of a product when an amended test procedure would alter the measure of efficiency on energy use for that product. *See* Section 323(e).

DOE has examined three possible actions: To adopt the continuous air method with the six- and six-method, to adopt the continuous air method with the six- and eight-method, or to retain the current damper method. The Department has evaluated the impacts each action would have on the industry and consumers, as well as the energy implications of each approach.

DOE believes the adoption of the ARI Standard 210/240–84 and ANSI/ASHRAE Standard 116–1983 continuous air test method (with either six-and six-method or six- and eight-method) would cause disruption of test facilities, increase manufacturer costs, delay research and development, and require DOE to revise the energy conservation standards in order not to have an impact on the stringency of the legislated minimum efficiency levels. Use of the current DOE test procedure will allow manufacturers to utilize their test facilities for research and development of new products meeting NAECA's minimum efficiency requirements. It also eliminates the various problems of retesting, rerating and redefining the SEER and the HSPF values. The Department believes that although the continuous air method is an adequate method of testing, the current method has achieved a level of familiarity, confidence, dependability, and reliability over the years. The transition to the new procedure would surface all the concerns that existed when the current test procedure was first introduced. For these reasons, DOE has decided not to incorporate ANSI/ASHRAE Standard 116–83 and ARI Standard 210/240–84, and the proposed cyclic test in today's rule, leaving the damper method in place.

2. Degradation Coefficient

Several commenters objected to the proposed change in the assigned value of the heating degradation coefficient (C_D) from .25 to .35. The York Company (York, No. 28, at 3–4) stated that the change to a .35 value for C_D would reduce the HSPF rating in Region IV by five percent, requiring manufacturers to retest. The test burden was seen as excessive by Addison (Addison, No. 43, at 5 and 8). Four additional commenters objected to changing the value of C_D. (Synder General, No. 41, at 3; ARI, No. 29, at 10; IEC, No. 32, at 2; Bard, No. 31, at 4). Information provided by the National Bureau of Standards (NBS) indicated a tendency for C_D to differ between heating and cooling by approximately 0.1. This information indicates the average value of the heating C_D to be between .20 and .30. DOE has reviewed the comments and the NBS analysis and agrees that raising the CD value will result in additional testing with little increase in the accuracy of the ratings and may, in some cases, result in less accurate efficiency ratings.

As a result of the comments and the review of the previous data collected, DOE has decided not to amend the heating degradation coefficient. The value will remain at its designed value of 0.25.

3. Part Load Factor

As part of the calculation for determining the SEER or HSPF, DOE proposed to change the current part load factor linear method to an exponential method. The Department received four comments on the issue of part load factor. These commenters agreed that DOE should not change the method of determination. Based on the analysis of 40 basic unit models of heat pumps and air conditioners, Carrier determined that the impact of an exponential versus linear part load factor was smaller than one percent for both SEER and HSPF. (Carrier, No. 40, at 6). Lennox agreed that this small change in the values was negligible. (Lennox, No. 35, at 4). York concerned that the increase in effort to calculate the part load factor for SEER or HSPF seemed pointless and unnecessary. (York, No. 28, at 4). ARI agreed with these comments (ARI, No. 39, at 10).

DOE has reviewed these comments and finds that the variance between the present straight line and the proposed exponential method will, in most cases, be absorbed in the rounding of the values, making the procedure change unnecessary. Therefore, DOE is not adopting the exponential method in today's final rule.

4. Rating Procedure for Untested Combinations of Split-System Central Air Conditioners.

The existing regulation for central air conditioners, including heat pumps, allows manufacturers of untested combinations of split-systems to rate such systems by engineering analysis methods or computer models developed by the individual manufacturer or a consulting engineering firm. DOE decided to address the issue of rating untested combinations since each such rating method is unique and there is debate concerning the accuracy of any particular rating method.

DOE proposed the adoption of a standard rating procedure for equipment combinations that are not laboratory tested in accordance with Appendix M. Most commenters addressed the standard rating procedure for untested combinations of split-system central air conditioners. The majority of commenters favored the use of a standard method or a privately developed method (alternative method) when it can be verified to be more accurate than the standard method, as the desired procedure for rating equipment in lieu of laboratory testing.

Six commenters favored a standard rating procedure. York, ARI, BARD and Carrier supported the use of the standard procedure for manufacturers not in a certification program similar to ARI's. (York, No. 28, at 4; ARI, No. 39, at 4; Bard, No. 31, at 4; and Carrier, No. 40, at 7). While commenters held various opinions concerning implementation, the concept of utilizing a standard rating procedure was acceptable. Trante (Trane, No. 26, at 7) was concerned with the release or acquisition by other

manufacturers of proprietary information if a manufacturer's alternative procedure was submitted to DOE because it was more accurate.

Further comment was received concerning many of the components in a combination and the credit which manufacturers should receive in the calculations of the standard rating method proposed by DOE. These components include fan delay, thermostatic expansion valves, solenoid valves, coil circuitry, and coil configuration. While the comments provided a diversity of opinion on these subjects, they did not present uniform solutions. Moreover, NBS' evaluation of these comments identified many areas of research required to resolve these issues. In view of the lack of consensus in the comments and NBS's need for further research, DOE has decided to omit a standard rating procedure from today's rule. However, DOE has requested NBS to resolve the problems expressed by the commenters. NBS will develop a standard rating procedure to be submitted to DOE for review. After review by DOE, it will be published as an National Bureau of Standards Interagency Report (NBSIR), placing it in the public domain, available to any manufacturer or consultant to use in rating untested combinations.

Commenters preferring their own alternative procedure to the standard rating procedure for untested combinations disagreed with the need to submit proprietary information, computer codes, and other historical data that had been very costly to acquire and were concerned about release of possible proprietary information to competitors. (Addison, No. 43, at 4; Synder General, No. 41, at 5; Magic Aire, No. 30, at 3). Two commenters stated that the alternative methods used by them are supplied by a consulting firm and that the ability to divulge the consultant's proprietary information to DOE is impractical since these manufacturers do not have access to the programs. (Addison, No. 43, at 4; and Bard, No. 31, at 4). DOE believes that in these circumstances the consultant can submit the necessary documentation, with the proprietary information properly identified, directly to DOE.

Rheem, an ARI member, commented that it wanted the ability to use any rating procedure without approval from DOE as long as the rating was certified under a program similar to ARI's. (Rheem, No. 29, at 4).

One commenter, not a member of ARI, was opposed to DOE providing a blanket exemption to ARI members. (First Co., No. 37, at 6).

The alternative method should be verified by test data and a complete, detailed description of the alternative method with calculated result. (Carrier, No. 40, at 8; Trane, No. 26, at 7; Addison, No. 43, at 4; Synder General, No. 41, at 5).

All manufacturer comments opposed submission of computer codes to DOE for evaluation. Several comments were concerned with the time it would take to review the alternative method and raised the concern that computer codes and other proprietary data might be made available to competitors.

One commenter recommended that, for purposes of verification of the alternative method, results and test data should be provided for two condenser units, each with two different coils. This would require four sets of tests to verify the accuracy of the alternative rating method. (Carrier, No. 40, at 8).

NBS identified the need for manufacturers to submit sufficient information to enable DOE to determine the accuracy of the alternative rating method. NBS believes that, at a minimum, this would require that the rating procedure be traceable to actual and complete test data, that complete documentation of the alternative method be provided, including the computer code when a computer model is used, and that all product-related information be included to allow for DOE verification of ratings submitted by the manufacturer.

DOE agrees that the use of an alternative rating method is appropriate, if the alternative rating method is more accurate than a standardized rating method. The provision to allow the use of an alternative method of rating was included as part of DOE's 1979 central air conditioner final rule. Manufacturers are required to conduct tests of samples of the high sales volume combination, condenser and coil, while the alternative rating method is used on other combinations. The alternative rating method represents values determined by computer simulation or engineering analysis as defined by a mechanical vapor compression refrigeration cycle. The 1979 rule required the alternative rating procedure be submitted to DOE.

Synder General suggested at the public hearing that most manufacturers that submitted alternative rating methods to DOE in 1980 have since amended these methods without resubmitting them for DOE approval. (Testimony, No. 1, Synder General, at 12).

This situation prompts DOE to require that all manufacturers that amend alternative rating methods resubmit such methods to DOE in a timely manner for DOE review and approval. The Department also believes that all alternative methods should be resubmitted for DOE review and approval in order to maintain integrity in the ratings. Consequently, manufacturers who previously submitted for use of an alternative method must resubmit such method to DOE and receive approval before continuing use of the alternative method for rating central air conditioners. The approval process is the same in structure to the current process. The purpose of DOE's review and approval process is to ensure that use of alternative rating methods results in accurate ratings.

The Department rejects the concerns regarding possible release of proprietary information. Under Title 10 CFR 1004.11, the sensitivity of proprietary information is protected from release provided the manufacturer identifies properly those sections containing such information. Rating procedures have been submitted to DOE since 1979. Pursuant to the provisions in DOE's regulations, there have been no instances of information, identified as proprietary, being released by DOE. Therefore, DOE does not share commenters' concerns that proprietary information explaining a manufacturers alternative method will be divulged to third parties. Accordingly, DOE is maintaining the requirement that manufacturers provide full documentation of alternate rating methods, including that which is considered proprietary, e.g., computer codes, etc., to DOE for approval prior to the use of the ratings in today's rule.

Several commenters stressed the need for accurate data on the various components of the system, inaccurate data or inappropriate assumptions could result in large errors. Carrier recommended the ability to determine coil capacities by a computer computation/simulation approved by DOE or a test standard such as ASHRAE Standard 33–78. (Carrier, No. 40, at 7). The First Company wanted information for the components to be made available by the manufacturer, whereas Trane opposed the divulging of information even to DOE, of what it considers proprietary information, as long as the components are not sold to other manufacturers. (First Co., No. 37, at 3; Trane, No. 26 at 7).

York suggested that a standard rating method include a coil scaling factor, coil circuitry and heating cycle (York, No. 28, at 4).

Many commenters felt that the two percent tolerance was unrealistic. Trane wanted to maintain the five percent

tolerance identified in § 430.23(m)(1) as providing for a 90 percent confidence, with a true mean divided by 95 percent. (Trane, No. 26 at 7). Rheem sought the adoption of a five percent tolerance for test versus calculation method results. (Rheem, No. 29, at 5). Three coil manufacturers, IEC, Magic Aire, and First Company commented that the proposed rating procedure would force the manufacturer to purchase various condensing units and matched coils for testing prior to making determinations of comparative coils, creating an added expense. (IEC, No. 32, at 3; Magic Aire, No. 30, at 2; First Company, No. 37, at 4).

It is anticipated that publication of the standard rating method as an NBSIR, will enable manufacturers to use it as an alternative to testing or as the basis for an alternative rating method. DOE believes that development and publication of a standard method of rating combinations of condensers and coils will improve design, replacement selection and make DOE approval of alternative rating methods quick and easy.

Several commenters addressed the definition of a coil family in discussing the requirement that test data supporting a manufacturer's alternative method include data for two complete lines of coil families for two condensing units. One commenter stated that a complete coil line (family) included all coils in the same coil configuration (up flow, down flow, or horizontal) with the same basic model number and designed for a certain evaporating temperature at a given capacity (Lennox, No. 35, at 3). York's definition included coils of a given design (A-coils, air handlers, horizontal, counter flow or flat top coils) equipped with the same expansion device. Each family could cover a range of capacity from one to five tons. (York, No. 28, at 4). ARI provided a similar definition. Addison defined a coil family as all coils used with any specific outdoor condenser unit. [Addison, No. 43, at 2].

DOE has defined a coil family in today's notice. DOE considers a coil family to be a group of coils with the same basic design features that affect the heat exchanger performance. Those features which identify a coil family are:

(i) Basic configuration (A-shape, V-shape, slanted or flat top coils, etc.)

(ii) Heat transfer surfaces on refrigerant side and air side (flat tubes vs. grooved tubes, different fin shapes on air side).

(iii) Tube and fin materials.

(iv) Coil circuitry.

The family will cover different coil sizes. When a group of coils has all these factors in common it is a family. DOE has in today's final rulemaking defined a "coil family" and identified the procedures for acquiring DOE approval of alternative rating methods for untested combinations of split-type systems. The standard rating method is not presented in today's notice, however, it will be published as a NBSIR.

5. Ground Water Source Heat Pump and Earth Coupled Heat Pumps

Several commenters maintained that there is no need for a test procedure for ground water-source or earth-coupled heat pumps (ARI, No. 39, at 2; Bard, No. 31, at 4; Friedrich, No. 36, at 1). DOE proposed to incorporate ARI Standard 325–85 which was already in use by ARI and several manufacturers. The acceptance of this test procedure, with limited changes, would have allowed consumers to compare the ground water-source, earth-coupled, and air source central air conditioners or heat pumps.

However, NAECA, enacted on March 17, 1987, defines "central air conditioner" as an "air-cooled product." This requirement eliminates ground water-source and earth-coupled heat pumps from the category of central air conditioner and the ratings required of covered products. Therefore, DOE is not including a test procedure for ground water-source and earth-coupled heat pumps in today's final rule.

6. Split Type Ductless Systems

Two commenters stated that the test procedure for the split-type, ductless systems with multiple coils providing for multiple zones should give credit for energy savings due to multizoning. (Daikin, No. 27, at 1 and Toshiba, No. 38, at 2).

DOE does not believe a credit is appropriate since other heating systems having similar capabilities, e.g., hydronic and electric resistance heating, receive no credit for this utility feature.

Toshiba discussed the possible combination of a variable-speed condensing unit with multiple ductless coils. (Toshiba, No. 38, at 2). The test procedure for this system, although not specifically designated, would, in fact, be a combination of the split-type ductless system and variable-speed procedures provided in this final rule.

Three commenters stated that the proposed test procedure for the split-type ductless system would be too burdensome. To reduce the testing burden these commenters requested that the definition of "combinations" as proposed be clarified. (IEC, 32 at 5; Toshiba, No. 38, at 14; ARI, No. 39, at 11). DOE agrees that the number of possible combinations would create a burdensome test procedure. For this reason the test procedure considers the ability to zone as a utility similar to air conditioners with setback thermostats. Zoning is a consumer preference, not an efficiency improvement. Therefore, the efficiency of the system is analyzed as a single zone. The requirements of rating by test or alternative method of various combinations of indoor coils with a single outdoor unit are covered under section 430.23, units to be tested, paragraph (m) (1) and (2).

Two-speed outdoor units for split-type ductless systems will use the two-speed rating procedure with all indoor coils connected as in the single speed rating procedure.

Variable-speed outdoor units shall be rated according to the variable-speed test procedure mentioned in today's rule with all indoor coil units connected for all required tests.

The retention of the damper method for testing requires that changes be made to the proposed test procedure to allow coverage of split-type ductless systems. These changes are required due to the deletion of the incorporation of ANSI/ASHRAE Standard 116–1983 and ARI Standard 210/240–84. These two standards contain information and procedures identifying the basis for the proposed test procedure for split-type ductless system. The cyclic test of ductless units will be performed without dampers. The indoor fan will be turned on three minutes before compressor "cut-on" and remain on for three minutes after compressor "cut-off." For calculating the cyclic coefficient of performance (COP) the integration time for capacity shall be from compressor "cut-on" time to indoor fan "cut-off" and the integration time for power will be the compressor "cut-on" to indoor fan "cut-off" time. The fan power for the three minutes after compressor "cut-off" shall be added to the integrated cooling capacity and subtracted from the integrated heating capacity. The indoor coils of the ductless system will require the addition of plenums on the outlets to allow for the measurement of air flow and the capacity of the system.

7. Demand Defrost

The present procedure provides an enchancement credit factor equal to 1.07 which is used as a multiplier on capacity at T_{out} equal 35°F. This multiplier results in an HSPF improvement of approximately four percent according to data submitted to DOE during the 1979 rulemaking.

The proposed rule introduced an enhancement factor to be applied as a

multiplier directly to HSPF. The multiplier has a maximum value of 1.04 which is varied between 1.04 and 1.00 for single-speed, two-speed and variable-speed systems based on the length of time between defrost.

ARI and Snyder General expressed support for the existing credit (1.07 ×Q(35)). (ARI, No. 39, at 12; Snyder General No. 41, at 3).

Lennox questioned the 90-minute time used in the proposed correlation as the shortest defrost time used in prorating the demand defrost credit but did not give any alternative suggestion. (Lennox, No. 35, at 5).

York commented that the proposed procedure fails to recognize the use of auxiliary head during the defrost cycle. Taking into account that outdoor air relative humidity during the defrost test is much higher than the average relative humidity in region IV, a heat pump will run a much longer time in the field between defrosts than during the frost accumulations test. Correcting for the reduced frequency of defrosts with drier weather increased the span of time between defrosts by a factor of 2.8 (a typical demand system would defrost at 3.63 hour intervals at the actual average weather conditions.) A system equipped with a time-temperature defrost control which goes into defrost every 90 minutes would require 19.6 percent more power than a demand defrost system at this condition. York concluded by proposing that the seven percent enhancement value for demand control systems be retained. If any changes are made, York supports the enhancement that would have a increased value with increased span time between defrosts. (York, No. 28, at 3).

Carrier pointed out that the enhancement credit for variable-speed systems is inconsistent with that prescribed for single-speed systems. (Carrier, No. 40, at 11). Carrier stated that the amount of credit given for a demand defrost control should be based on the ratio of the time between defrosts during the frost accumulation test to the maximum time between defrost allowed by the demand defrost control. Carrier proposed the formula:

$FD = 1 + 0.04 \times (1 - Ttest - 90.0)/Tmax - 90.0)$

where:

FD = demand defrost credit (used as a multiplier to HSPF)

Ttest = test time between defrosts (in minutes)

Tmax = lesser of 720 or the maximum time between defrosts allowed by the unit control (in minutes)

Trane supported the concept of proportioning the demand defrost with the measured time between defrost terminations. (Trane, No. 26, at 4). However, Trane pointed out a lack of consistency in the time between defrost terminations for different units of the same model, and commented that the proposed correlation, being very sensitive to this time, may provide significantly different values of the damand defrost credit during the rating verification process. In connection with this observation, Trane suggested another form of the equation for the demand defrost credit:

$Fd = 1.03 + 0.03 \times [(90 - T_{test})/630]$

DOE recognizes that frosting/defrosting of a heat pump is a very complex phenomenon governed by system design and controls, operating conditions and sizing. System performance degradation in the frosting region is related to three basic penalties:

1. Degradation of performance due to frosting itself; formation of frost on the outdoor coil reduces system instantaneous capacity, and reduces system instantaneous COP.

2. Decrease of average capacity due to the need to perform defrosting of the outdoor coil. The time used by a system to defrost is subtracting from the time that would be used for heating, thus reducing system ability to supply heat. In addition, negative capacity (additional load) is introduced to the house.

3. Use of tempering heat above the balance point. Since delivery of cold air to the conditioned space would not be acceptable, an electric heater is used to temper heat pump negative capacity. If defrost occurs above the balance point, use of the electric heat degrades system seasonal efficiency.

DOE agrees that different heat pumps will exhibit different performance degradation due to frosting/defrosting. The three penalties identified above may have differing shares in performance degradation for different systems.

DOE recognizes that the present rating procedure contains the following simplifications affecting the HSPF rating:

- The procedure does not include frosting/defrosting below 17°F outdoor temperature even for time defrost controlled systems, (penalty no. 1 and 2.) Consequently, system capacity prescribed in the procedure is optimistically high (approx. 3–5 percent) for time-defrost heat pumps.
- The procedure does not take into account heat tempering above the balance point (penalty no. 3.)

A review of the comments on demand defrost credit show that manufacturers do not have a clear understanding of the objective of the demand defrost credit. DOE believes that demand defrost credit should be applied as compensation for improved performance not measured during the defrost test because of high humidity specification, and that frosting/defrosting is too complex for attempts to describe all three penalties by one correlation. The present procedure takes into account performance degradation due to frosting of the outdoor coil (penalty no. 1) through a test at 35 °F outdoor temperature. In order to shorten the defrost test, high outdoor humidity conditions, more severe than average in the field, were prescribed. During this test a system with demand defrost may not show its full performance potentital.

If the time between defrosts is the same for this unit as if equipped with a time controlled defrost, a credit is in order for the system because full sustem performance ability in field conditions was not measured during the test. On the other hand, if a system with a demand defrost control does not go into defrost at all during the 35 °F test, no extra credit should be given to the unit because the test accounted (on a relative basis) for the full performance potential of the tested unit. Systems equipped with demand defrost, that defrost during testing but after the period allotted to time controlled defrost systems, should receive a credit based on a prorated value of the actual defrost time versus the duration of the defrost test.

As a result of the review of the industry comments and performance data collected for ten various models with demand defrost, NBS recommended a revised formula for crediting demand defrost.

$Fs = 1 + 0.03 \times (1 - (Ttest - 90)/(Tmax - 90))$

where:

Fd = demand defrost credit (used as a multiplier to HSPF)

Ttest = time between defrost terminations in minutes
or
90, whichever is greater

Tmax = maximum time between defrosts allowed by controls in minutes
or
720, whichever is smaller

The correlation provides three percent credit for a system with demand defrost which has 90 minutes or less time between defrost terminations during the frost accumulation test. The amount of credit is linearly prorated to zero for longer time spans between defrosts. A value of zero is attained if the test time reaches the maximum compressor time allowed by its controls or maximum time prescribed by the procedure (720

minutes). The value of the maximum credit (three percent) was chosen based on review of the HSPF values of ten heat pumps with a demand defrost credit calculated using the existing procedure and applying a seven precent correction for capacity at the 35 °F test and comparing to the HSPF for the same units calculated without a seven percent capacity correction at the DHRmin in region IV. The seven percent capacity correction resulted in an HSPS improvement between 2.81 and 2.99 percent.

Based on the information and data provided, DOE has selected the maximum demand defrost credit of 1.03. DOE adopted the revised equation recommended by NBS to determine the value of the credit in today's final rule.

8. Variable Speed Units

One commenter, KeepRite, proposed adding a test to measure the difference in load matching ability of variable-speed units, and outlined the basis for such a test. (KeepRite, No. 33, at 1). KeepRite also recommended that systems with automatic controls and manual controls be differentiated. At this time, DOE does not believe there is a need for a procedure to test variable-speed systems for load matching ability. The test, as outlined by KeepRite, appears difficult to prescribe and burdensome to conduct. Regarding differentiation between manual and automatic controls, DOE does not think that systems with manual controls (in which a homeowner can set speed manually) will be offered in the market place. Therefore, DOE believes the effort to develop and present a procedure for manual variable-speed is not justified.

KeepRite commented that additional test points are needed at different intermediate speeds to more accurately represent the performance of variable-speed units. (KeepRite, No. 33, at 2). Trane showed that increasing the number of intermediate test points improves SEER of the tested unit. According to Trane, the impact of the number of test points is most significant for the unit of the highest maximum speed to minimum speed ratio. For this ratio having the value of 3.5, the addition of the first intermediate speed test (to the single-speed procedure) improved the SEER by 11 percent. The next additional point improved the SEER by one percent over the previous value (calculated with one intermediate test point). An additional third point provided an improvement of approximately 0.8 percent. (Trane, No. 26, at 16).

Since additional improvement to the SEER rated value decreases significantly with additional intermediate test points, adding such points does not seem to be the best solution. Instead, NBS suggested modifications to the proposed method to better account for variable-speed system performance during operation in the intermediate speed region. The DOE proposal used linear interpolation of the power input between the intermediate speed point and the maximum and minimum balance points for evaluation of the input power to the unit. NBS suggested using the same points for interpolation but with the following changes:

—Perform interpolation using EER or COP values and then derive the energy input by dividing capacity by EER or COP;

—Perform parabolic interpolation.

The advantage of this approach allows for the interpolation of EER (COP) versus interpolation of energy input.

The procedure relies on three performance points for evaluation of the unit performance in the intermediate speed operation range. The three points are:

—Maximum speed balance point (the intersection point between the building load line and the heat pump capacity line at the maximum speed);

—Minimum speed balance point (the intersection point between the building load line and the heat pump capacity line at the minimum speed); and

—Intermediate speed point (the intersection point between the building load line and the heat pump capacity line at the intermediate speed at which the unit was tested at 87°F temperature).

At these three points the unit capacity and power are known. To evaluate power NBS recommended obtaining power in the intermediate speed region through evaluating EER (COP) at the three points, interpolating EER (COP) at required temperature bins, and using the building loads at these temperatures and EERs (COPs).

NBS explained that since the capacity line, i.e., the building load line, is straight, the power line could also be a straight line if EER were independent of temperature. If EER was prescribed by a linear equation, the power line equation will be of a higher order. Thus the complexity of the power line is affected by the complexity of the EER line, with the power line always more complex.

NBS recommends the parabolic interpolation for two reasons:

—Unlike the power line, the EER (COP) line in the intermediate speed region may be either convex or concave. A straight line interpolation would unduly benefit systems with intermediate EERs following a concave line.

—From the comments received it appears that the EER line is of the second or higher order. Although different systems may have different characteristics, a parabolic fit should give the best estimation of the EER line with three data points as input.

Trane commented that the intermediate speed test should be run at a speed one-third of the way between the maximum speed and the minimum speed. (Trane, No. 26, at 17.) Trane's recommendation calls for the same speed in the cooling mode and the heating mode based on the maximum speed and minimum speed in the cooling mode.

Carrier commented that the intermediate speed test should not be fixed, but rather be specified in terms of minimum and maximum compressor speeds and respective capacities. (Carrier, No. 40, at 11.)

Lennox commented that the compressor speed at the intermediate speed test should be "tied down" better, perhaps in terms of inverter frequency. (Lennox, No. 35, at 4.) Carrier supported the proposed intermediate speed tolerance of plus or minus 10 percent. Trane considered this tolerance to be wide and suggested narrowing it to plus or minus 5 percent. York commented that system capacity at Tout=47°F used for calculation of the minimum and maximum DHR should be obtained at the compressor speed corresponding to maximum speed in the cooling mode.

DOE found that the speed for the intermediate speed test proposed in the proposed rule (average between the maximum and minimum compressor speeds) results in a capacity significantly greater than the building load at 87°F. Two commenters stated that description of the speed being one-third between the maximum speed and the minimum speed provides a reasonable estimate of the proper speed for the intermediate speed test. DOE also concurred with the need to identify the intermediate speed precisely to create repeatable tests. For this reason the intermediate speed is identified in terms of inverter frequency with a tolerance of plus 5 percent or the next higher step above the calculated speed. The maximum and minimum speeds to be used are those for the cooling mode:

Intermediate speed = min. speed + ⅓ (max. speed—min. speed)

It was suggested that 12 minutes on-time should be allowed only if the minimum speed is half the maximum speed. The off-time should be 18 minutes to reflect the decrease off-time variable-speed systems should provide. (Lennox, No. 35, at 4.) York commented that compressor on-time should be increased for variable-speed units but this increase should not be set arbitrarily to 12 minutes; the amount of increase should depend on the maximum to minimum capacity ratio. (York, No. 28, at 6.)

NBS pointed out that the amount of time prescribed as on-time and off-time for the cyclic test, following basic thermostat relationships, could be evaluated by the equations:

$$Ton = 6\ min \times Qmax/Qmin$$
$$Toff = 4 \times Ton$$

Following these equations, the time of the cycle would depend on the capacity modulation ration allowing longer on-time (and off-time) for systems with greater capacity modulation capability. NBS presented data for which a system with capacity modulation ratio of two, the penalty is less that five percent, while for a system with capacity modulation ratio of three, the penalty is less than 2.5 percent. Consequently, DOE believes that it is not practical to prescribe tests longer than one hour (12 minutes on, and 48 minutes off). Today's rule includes DOE's determination of the following cycle times for variable-speed units for both cooling and heating T_{on} is 12 minutes and T_{off} 48 minutes in order to retain the 20 percent on-time used in the single speed system procedure.

Trane suggested adding an optional nominal capacity test to allow the ratings to reflect energy savings of systems in which the maximum speed in the heating mode is greater than the maximum speed in the cooling mode. Trane suggested defining this nominal capacity as the capacity obtained at the compressor speed which is the lesser of the maximum speed allowed by controls in the cooling mode and the heating mode. (Trane, No. 26, at 17). DOE has adopted this test in today's rule as an optional test to be included for manufacturers with units which have the necessary characteristics to implement this test.

Carrier commented that the procedure should have provision for fan delay. The capacity integration period should include 12 minutes on-time plus the period of the fan delay. Similarly, the fan power should be integrated for 12 minutes plus the fan period. (Carrier, No. 4, at 11). NBS agreed with this comment if DOE decided to retain the damper test method.

DOE, in its decision to retain the damper method, has concluded that fan delay for variable-speed systems should be treated the same as for the current single-speed and two-speed units. This will provide a common perspection for units with fan delay verses those without fan delay.

NBS commented that if HSPF calculations are performed for the maximum design heating requirement, the procedure will underestimate energy input to the electric heater, overestimating the efficiency descriptor because the intersection point between the building load line and the maximum speed capacity line would fall around 35°F temperature. NBS recommended using the maximum speed capacity line with degradation due to frost accumulation as is done in the procedure for the single-speed systems by applying system capacity, Q(35), and power, E(35), at 35 °F outdoor temperature.

The NBS recommendations include correction factors of ten percent for capacity and 1.5 percent for power. These factors were selected after a review of test data of heat pumps equipped with demand defrost controls. NBS further recommended the tolerance for power measurement of 0.5 percent be maintained for variable-speed systems.

DOE evaluated the NBS comments on the capacity and energy input lines for determining HSPF and agrees that the method is sound. Therefore, the variable-speed procedure includes degradation due to frost accumulation at the maximum speed. The capacity and power of a variable-speed system at the maximum speed will be evaluated based on performance at 17 °F, 47 °F and 35 °F outdoor temperatures. The NBS equations are included in today's rulemaking.

9. Transition Period

Several commenters expressed concern with the impact of the effective date of the new procedures and any transition period. Since these comments addressed the implementation of a new test procedure for single speed and two-speed units other than the damper method, DOE has decided that these concerns have been resolved with DOE's decision to retain the damper method.

Since this amendment to the central air conditioner test procedure is concerned only with the demand defrost credit and additional procedures for split-type ductless systems, variable-speed systems, and untested combinations, DOE believes that a transition period is not necessary.

The amendments for new models will be effective 180 days after publication in the **Federal Register.**

During the period between publication and effective date, all manufacturers using an alternative method to rate untested combinations of central air conditioners or heat pumps must submit the necessary data to DOE for review and approval. Failure to receive approval for the alternative rating method will require manufacturers to amend the method or use testing to rate the equipment. Submittals of alternative rating methods should be made within three months of publication of today's rulemaking in order for review and approval to be assured by the effective date of this amendment. Those manufacturers not receiving approval prior to the effective date, must submit a written request to DOE for an extension.

c. Procedural Matters

1. *Test Procedures.* The test procedures for central air conditioners prescribed today are included in Subpart B of Part 430 and are substantially the same as those established in the existing procedures with the exception of the changes discussed above. Appendix M of Subpart B provides test procedures for those models of central air conditioners currently requiring waivers. The changes to appendix M of Subpart B do not incorporate the ASHRAE and ARI commercial standards contained in the proposed rulemaking, thus the requirements of the Federal Energy Administration Act do not apply.

2. *General Provisions.* Today's rulemaking contains the definitions of "central air conditioner," and "heat pump" as identified in NAECA and DOE's definition of a "coil family."

3. *Application of Test Procedures.* The test procedures prescribed today address variable-speed systems and split-type ductless systems. The revision of the demand defrost credit in today's notice applies to all system types. The new procedures will provide ratings comparable to those ratings already received pursuant to granted waiver test procedures. The compatibility of the new rating procedures with those established in prior rulemakings creates no conflict with the conservation standards established by NAECA.

d. Environmental Review

Pursuant to section 7(c)(2) of the Federal Energy Administration Act of 1974, DOE submitted a copy of this notice to the Administrator of the Environmental Protection Agency on January 29, 1987, for his comments

concerning the impact of this proposal on the quality of the environment. A response, dated April 6, 1987, was received expressing support of the rulemaking.

Since test procedures under the energy conservation program for consumer products will be used only to standardize the measurement of energy usage, and will not affect the quality of distribution of energy usage, prescribing test procedures will not result in any environmental impacts. DOE, therefore, has determined that prescribing test procedures under the energy conservation program for consumer projects clearly is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environment Policy Act of 1969. Consequently, neither an Environmental Impact Statement nor an Environmental Assessment is required for the final rule.

e. Review Under Executive Order 12291

This final rule has been reviewed in accordance with Executive Order 12291 which directs that all regulations achieve their intended goals without imposing unnecessary burdens on the economy, on individuals, on public or private organizations, or on State and local governments. The Executive Order also requires that regulatory impact analyses be prepared for "major rules." The Executive Order defines "major rule"as any regulation that is likely to result in: (1) An annual effect on the economy of $100 million or more; (2) a major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or (3) significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United State-based enterprises to compete with foreign-based enterprises in domestic or export markets.

This final rule only amends existing test procedures for central air conditioners and heat pumps, adding procedures for innovative designs such as variable-speed heat pumps and split type ductless systems. These procedures only serve to relieve the burden of requesting waivers. Therefore, DOE has determined that any burden imposed on any person, industry, or government entity by the amendment of existent procedures, is not sufficient to bring the final rule within the definition of "major rule."

f. Regulatory Flexibility

The Regulatory Flexibility Act, Pub. L. 96-345 (5 U.S.C. 601-612), requires that an agency prepare an initial regulatory flexibility analysis to be published at the time the final rule is published. This requirement (which appears in section 603) does not apply if the agency "certifies that the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities." The final rule affects manufacturers of central air conditioners and heat pumps. As previously discussed, the changes will not have significant economic impacts, but rather will simply improve the test procedures. Furthermore, DOE is not aware of any central air conditioner manufacturers that would be considered small entities under the Act. Therefore, DOE certifies that the final rule will not have a "signficant economic impact on a substantial number of small entities."

(Energy Policy and Conservation Act, Pub. L. 94-163, as amended by Pub. L. 95-619; and Pub. L. 100-12, Department of Energy Organization Act, Pub. L. 95-91).

List of Subjects in 10 CFR Part 430

Administrative practice and procedures, Energy conservation, Household appliances.

In consideration of the foregoing, Part 430 of Chapter II of Title 10, Code of Federal Regulations, is amended as set forth below, effective September 12, 1988.

Issued in Washington, DC, March 2, 1988.

Donna R. Fitzpatrick,

Assistant Secretary, Conservation and Renewable Energy.

PART 430—ENERGY CONSERVATION PROGRAM FOR CONSUMER PRODUCTS

1. The authority citation for Part 430 continues to read as follows:

Authority: Energy Policy and Conservation Act, Title III, Part B, as amended by National Energy Conservation Policy Act, Title IV, Part 2, and National Appliance Energy Conservation Act (42 U.S.C. 6291-6309).

2. Section 430.2 is amended by deleting the definitions of "Air-source heat pump", "Cooling only unit", and "Water-source heat pump" and by revising the definition of "Central air conditioner" and "Heat pump" and adding the definition of a "Coil family" to read as follows:

§ 430.2 Definitions.

* * * * *

"Cental air conditioner" means a product, other than a packaged terminal air conditioner powered by single phase electric current, which is air-cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling only unit.

* * * * *

"Heat pump" means a product, other than a packaged terminal heat pump, which consists of one or more assemblies, powered by single phase electric current, rated below 65,000 Btu per hour, utilizing an indoor conditioning coil, compressor, and refrigerant-to-outdoor air heat exchanger to provide air heating, and may also provide air cooling, dehumidifying, humidifying circulating, and air cleaning.

* * * * *

"Coil family" means a group of coils with the same basic design features that affect the heat exchanger performance. These features are the basic configuration, i.e., A-shape, V-shape, slanted or flat top, the heat transfer surfaces on refrigerant and air sides (flat tubes vs. grooved tubes, fin shapes), the tube and fin materials, and the coil circuitry. When a group of coils has all these features in common, it constitutes a "coil family."

3. Section 430.22 is amended by revising paragraph (m) to read as follows:

§ 430.22 Test procedures for measures of energy consumption.

* * * * *

(m) *Cental Air Conditioners.* (1) The estimated annual operating cost for cooling-only units and air-source heat pumps shall be one of the following:

(i) For cooling-only units or the cooling portion of the estimated annual operating cost for air-source heat pumps which provide both heating and cooling, the product of: (A) The quotient of the cooling capacity, in Btu's per hour, determined from the steady-state wet-coil test (Test A) measured at the highest compressor speed, as described in section 3.1 of Appendix M to this subpart, divided by the seasonal energy efficiency ratio, in Btu's per watt-hour, determined from section 5.1 of Appendix M to this subpart; (B) the representative average use cycle for cooling of 1,000 hours per year; (C) a conversion factor of 0.001 kilowatt per watt; and (D) the representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act, the resulting product then being rounded off to the nearest dollar per year;

(ii) For air-source heat pumps which provide only heating or the heating portion of the estimated annual operating cost for air-source heat pumps which provide both heating and cooling, the product of: (A) The quotient of the

standardized design heating requirement, in Btu's per hour, nearest to the capacity measured in the high temperature test, determined in sections 5.2 and 6.2.6 of Appendix M to this subpart, divided by the heating seasonal performance factor, in Btu's per watt-hour, calculated for heating region IV corresponding to the above mentioned standardized design heating requirement determined from section 5.2 of Appendix M to this subpart; (B) the representative average use cycle for heating of 2,080 hours per year; (C) the adjustment factor of 0.77 which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system; (D) a conversion factor of 0.001 kilowatt per watt; and (E) the representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act, the resulting product then being rounded off to the nearest dollar per year; or

(iii) For air-source heat pumps which provide both heating and cooling, the estimated annual operating cost is the sum of the quantity determined in paragraph (m)(1)(i) of this section added to the quantity determined in paragraph (m)(1)(ii) of this section.

(2) The estimated regional annual operating cost for cooling-only units and for air-source heat pumps shall be one of the following:

(i) For cooling-only units or the cooling portion of the estimated regional annual operating cost for air-source heat pumps which provide both heating and cooling, the product of: (A) The quotient of the cooling capacity, in Btu's per hour, determined from the steady-state wet-coil test (Test A) measured at the highest compressor speed, as described in section 3.1 of Appendix M to this subpart, divided by the seasonal energy efficiency ratio, in Btu's per watt-hour, determined from section 5.1 of Appendix M to this subpart; (B) the estimated number of regional cooling load hours per year determined from section 6.1.3 of Appendix M to this subpart; (C) a conversion factor of 0.001 kilowatts per watt; and (D) the representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act, the resulting product then being rounded off to the nearest dollar per year;

(ii) For air-source heat pumps which provide only heating or the heating portion of the estimated regional annual operating cost for air-source heat pumps which provide both heating and cooling, the product of: (A) The quotient of the standardized design heating requirement, in Btu's per hour, nearest to the capacity measured in the high temperature test (Test A), determined in sections 5.2 and 6.2.6 of Appendix M to this subpart, divided by the heating seasonal performance factor, in Btu's per watt-hour, calculated for the appropriate region of interest and corresponding to the above mentioned standardized design heating requirement determined from section 5.2 of Appendix M to this subpart; (B) the estimated number of regional heating load hours per year determined from section 6.2.5 of Appendix M to this subpart; (C) the adjustment factor of 0.77 which serves to adjust the calculated design heating requirement and heating load hours to the actual load experienced by a heating system; (D) a conversion factor of 0.001 kilowatts per watt; and (E) the representative average unit cost of electricity in dollars per kilowatt-hour as provided pursuant to section 323(b)(2) of the Act, the resulting product then being rounded off to the nearest dollar per year; or

(iii) For air-source heat pumps which provide both heating and cooling, the estimated regional annual operating cost is the sum of the quantity determined in paragraph (m)(3)(i) of this section added to the quantity determined in paragraph (m)(3)(ii) of this section.

(3) The measure(s) of efficiency for cooling-only units and air-source heat pumps shall be one or more of the following:

(i) The seasonal energy efficiency ratio for cooling-only units and air-source heat pumps which provide cooling shall be the seasonal energy efficiency ratio, in Btu's per watt-hour, determined according to section 5.1 of Appendix M to this subpart, rounded off to the nearest 0.05.

(ii) The heating seasonal performance factors for air-source heat pumps shall be the heating seasonal performance factors, in Btu's per watt-hour, determined according to section 5.2 of Appendix M to this subpart for each applicable standardized design heating requirement within each climatic region, rounded off to the nearest 0.05.

(iii) The annual performance factors for air-source heat pumps which provide heating and cooling, shall be the annual performance factors, in Btu's per watt-hour, determined according to section 5.3 of Appendix M to this subpart for each standardized design heating requirement within each climatic region, rounded off to the nearest 0.05.

(4) Other useful measures of energy consumption for central air conditioners shall be those measures of energy consumption which the Secretary of Energy determines are likely to assist consumers in making purchasing decisions and which are derived from the application of Appendix M to this subpart.

(5) After September 12, 1988, all measures of energy consumption shall be determined by the test method as set forth in Appendix M to this subpart; or by an alternate rating method set forth in § 430.23(m)(4) as approved by the Assistant Secretary for Conservation and Renewable Energy in accordance with § 430.23(m)(5).

* * * * *

4. Section 430.23 is amended by revising paragraphs (m) (2) through (7) to read as follows:

§ 430.23 Units to be tested.

* * * * *

(m) * * *

(2) The condenser-evaporator coil combination selected for tests pursuant to paragraph (m)(1) of this section shall be that combination manufactured by the condensing unit manufacturer likely to have the largest volume of retail sales. Components of similar design may be substituted without requiring additional testing if the represented measures of energy consumption continue to satisfy the applicable sampling provisions of paragraphs (m)(1)(i) and (m)(1)(ii) of this section. For every other condenser-evaporator coil combination manufactured by the same manufacturer or in part by a component manufacturer using that same condensing unit, either—

(i) A sample of sufficient size, comprised of production units or representing production units, shall be tested to ensure that the requirements of paragraphs (m)(1)(i) and (m)(1)(ii) of this section are met for such other condenser-evaporator coil combinations; or

(ii) The representative values of the measures of energy consumption shall be based on an alternative rating method that has been approved by DOE in accordance with the provisions of paragraphs (m)(4) and (m)(5) of this section.

(3) Whenever the representative values of the measures of energy consumption, as determined by the provisions of paragraph (m)(2)(ii) of this section, do not agree within five percent of the representative values of the measures of energy consumption as determined by actual testing, the representative values determined by actual testing shall be used to comply with section 323(c) of the Act, or to comply with rules prescribed under section 324 of the Act.

(4) The basis of the alternative rating method referred to in paragraph (m)(2)(ii) of this section shall be a

representation of the test data and calculations of a mechanical vapor compression refrigeration cycle. The major components in the refrigeration cycle shall be modeled as "fits" to manufacturer performance data or by graphic or tabular performance data. Heat transfer characteristics of coils may be modeled as a function of face area, number of rows, fins per inch, refrigerant circuitry, air flow rate and entering air enthalpy. Additional performance-related characteristics to be considered may include type of expansion device, refrigerant flow rate through the expansion device, power of the indoor fan and degradation coefficient.

(5) Manufacturers who elect to use an alternative rating method for determining measures of energy consumption under paragraphs (m)(2)(ii) and (m)(4) of this section must submit a request to DOE for reviewing the alternative rating method to the Assistant Secretary of Conservation and Renewable Energy, 1000 Independence Avenue, SW., Washington, DC 20585, and receive approval to use the alternative method by the Assistant Secretary before the alternative method may be used for rating central air conditioners.

(6) Each request to DOE for reviewing an alternative rating method shall include:

(i) The name, address and telephone number of the official representing the manufacturer.

(ii) Complete documentation of the alternative rating procedure, including the computer code when a computer model is used.

(iii) Test data for two coils from two different coil families for two different condensing units. The tested capacities for the matched systems for the two condensing units shall differ by at least a factor of two. Rating information for the mixed systems shall include the ratings from testing, and from the alternative rating method.

(iv) Complete test data, product information, and related information to allow DOE to verify the rating information submitted by the manufacturer.

(7) Manufacturers that elect to use an alternative rating method for determining measures of energy consumption under paragraphs (m)(2)(ii) and (m)(4) of this section must either subject a sample of their units to independent testing on a regular basis, e.g., voluntary certification program, or have the representations reviewed and certified by an independent state-registered professional engineer who is not an employee of the manufacturer. The registered professional engineer is to certify that the results of the alternative rating procedure accurately represent the energy consumption of the unit(s). The manufacturer is to keep the registered professional engineer's certifications on file for review by DOE for as long as said combination is made available for sale by the manufacturer. Any change to be made to the alternative rating method, must be approved by DOE prior to its use for rating.

* * * * *

Appendix M to Subpart B—[Amended]

5. Appendix M to Subpart B of Part 430 is amended by deleting sections 2.4, 3.4, 4.4, 5.4, 5.5, 5.6 and deleting from the seventh paragraph, section 5.2, the sentence "For units with demand defrost control system * * *," revising the headings for sections 2.1, 2.2., 3.1, 3.2, 4.1, and 4.2, adding five sentences at the end of section 4.1.1.2, adding one sentence at the end of 4.2.1.2 and 4.2.1.3, adding a paragraph to the end of section 5.2 and adding sections 2.1.5 through 2.1.7, 2.2.3 through 2.2.5, 3.1.5 through 3.1.7, 3.2.3 through 3.2.5, 4.1.1.3 through 4.1.1.5, and 5.1.5, 5.1.6, 5.1.7, 5.2.3, 5.2.4 and 5.2.5.

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2.1 *Testing required for air source cooling only units.*

* * * * *

2.1.5 *Testing required for units with triple-capacity compressors.* (Reserved)

2.1.6 *Testing required for units with variable-speed compressors.* The tests for variable-speed equipment consist of five (5) wet coil tests and two (2) dry coil tests. Two of the wet coil tests, A and B, are conducted at the maximum speed. Two wet coil tests, B_2 and low temperature test, are conducted at the minimum speed. The fifth wet coil test is conducted at an intermediate speed. Dry coil tests, C and D, are conducted at the minimum speed if the coefficient of degradation (C_D) value of 0.25 is not adopted. The test conditions and procedures for the above are outlined in sections 3.1 and 4.1 of this Appendix.

2.1.7 *Testing required for split-type ductless systems.* The tests for split-type ductless systems are determined by the type of compressor installed in the outdoor unit. For the appropriate tests refer to sections 2.1.1, 2.1.2, 2.1.3, 2.1.4, 2.1.5, or 2.1.6 of this Appendix.

2.2 *Testing required for air source heating only units.*

* * * * *

2.2.3 *Testing required for units with triple-capacity compressors.* (Reserved)

2.2.4 *Testing required for units with variable-speed compressors.* There are seven basic tests and one optional test for variable-speed units. Three tests (high temperature test, low temperature test, and frost accumulation test) are performed at the maximum speed. Three tests (two high temperature and one cyclic test) are performed with the unit operating at minimum speed. A second frost accumulation test is performed at an intermediate speed. The intermediate speed is the same as in the cooling mode.

In lieu of the maximum speed frost accumulation test, two equations are provided in section 4.2 of this Appendix. In lieu of the cyclic test an assigned value of 0.25 may be used for the coefficient of degradation C_D. The optional test is a nominal capacity test applicable to units which have a heating mode maximum speed greater than the cooling mode maximum speed. The conditions and procedures for the above tests are described in sections 3.2 and 4.2 respectively, of this Appendix.

2.2.5 *Testing required for split-type ductless system.* The type of compressor installed in the outdoor unit determines the testing required, refer to previous sections 2.2.1, 2.2.2, 2.2.3, or 2.2.4. The conditions and procedures will be modified as indicated for the various types as stated in sections 3.2 and 4.2 respectively.

* * * * *

3.1 *Testing conditions for air source cooling only units.*

* * * * *

3.1.5 *Testing conditions for units with triple-capacity compressors.* (Reserved)

3.1.6 *Additional testing conditions for cooling-only units with variable-speed compressors.* For cooling-only units and air-source heat pumps with varaible-speed compressors, the air flow rate at fan speeds less than the maximum fan speed shall be determined by using the fan law for a fixed resistance system. The air flow rate is given by the ratio of the actual fan speed to the maximum fan speed multiplied by the air flow rate at the maximum fan speed. Minimum static pressure requirements only apply when the fan is running at the maximum speed.

3.1.6.1 *Testing conditions for steady-state wet coil tests.* Tests A and B shall be performed at the maximum speed at conditions specified in section 3.1.1 of this Appendix. Test B_2 and the low temperature test are performed at the minimum speed with outdoor dry bulb temperatures of 82°F and 67°F respectively. The intermediate speed wet coil test is performed at the outdoor dry bulb temperature of 87°F. For units which reject condensate the outdoor wet bulb temperature shall be maintained at 75°F for Test A, 65°F for Tests B and B_2, 53.5°F for the low temperature test and 69°F for the intermediate test. The indoor conditions for all wet coil tests are the same as those given in section 3.1.1 of this Appendix.

3.1.6.2 *Test conditions for dry coil tests.* Dry coil Tests C and D are conducted at an outdoor dry bulb temperature of 67°F. For units which reject condensate the outdoor wet bulb temperature shall be maintained at 53.5°F. The indoor dry bulb temperature shall be 80°F and the wet bulb temperature shall be sufficiently low so no condensation occurs on the evaporator (It is recommended that an indoor wet bulb temperature of 57°F or less be used).

3.1.7 *Split-type ductless systems.* Test conditions shall be the same as those specified for the same single outdoor unit compressor type, assuming it was matched with a single indoor coil.

3.1.7.1 *Interconnection.* For split-type ductless systems, all standard rating tests shall be performed with a minimum length of 25 feet of interconnecting tubing between each indoor fan-coil unit and the common outdoor unit. Such equipment in which the interconnection tubing is furnished as an integral part of the machine not recommended for cutting to length shall be tested with complete length of tubing furnished, or with 25 feet of tubing, whichever is greater. At least 10 feet of the interconnection tubing shall be exposed to the outside conditions. The line sizes, insulation and details of installation shall be in accordance with the manufacturer's published recommendation.

3.1.7.2 *Control testing conditions for split-type ductless systems.* For split-type ductless systems, a single control circuit shall be substituted for any multiple thermostats in order to maintain a uniform cycling rate during test D and the high temperature heating cyclic test. During the steady-state tests, all thermostats shall be shunted resulting in all indoor fan-coil units being in operation.

3.1.7.3 *Split-type ductless systems with multiple coils or multiple discharge outlets shall have short plenums attached to each outlet.* Each plenum shall discharge into a single common duct section, the duct section in turn discharging into the air measuring device (or a suitable dampering device when direct air measurement is not employed). Each plenum shall have an adjustable restrictor located in the plane where the plenums enter the common duct section for the purpose of equalizing the static pressures in each plenum. The length of the plenum is a minimum of $2.5\times(A\times B)^{.5}$, A = width and B = height of duct or outlet. Static pressure readings are taken at a distance of $2\times(A\times B)^{.5}$ from the outlet.

3.2 *Testing conditions for air source heating only units.*

* * * * *

3.2.3 *Testing conditions for units with triple-capacity compressors.* (Reserved)

3.2.4 *Testing conditions for units with variable-speed compressors.* The testing condition for variable-speed compressors shall be the same as those for single speed units as described in section 3.2.1 of this Appendix with the following exceptions: the cyclic test is performed with an outdoor dry bulb temperature of 62°F and a wet bulb temperature of 56.5°F. The optional, nominal capacity test shall be performed at the conditions specified for the 47°F high temperature test.

3.2.5 *Testing conditions for split-type ductless system.* The testing conditions for split-type ductless systems shall be based on the type of compressor installed in the single outdoor unit. The heating mode shall have the same piping and control requirements as in 3.1.7.

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4.1 *Test procedures for air source cooling-only units.*

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4.1.1.2 * * *

Cooling cyclic tests for variable-speed units shall be conducted by cycling the compressor 12 minutes "on" and 48 minutes "off". The capacity shall be measured for the integration time (θ), which is the compressor "on" time of 12 minutes or the "on" time as extended by fan delay, if so equipped. The electrical energy shall be measured for the total integration time (θ_{cyc}) of 60 minutes. In lieu of conducting C and D tests, an assigned value of 0.25 shall be used for the degradation coefficient for cooling, C_D.

4.1.1.3 *Testing procedures for triple-capacity compressors.* (Reserved)

4.1.1.4 *Intermediate cooling steady-state test for units with variable-speed compressors.* For units with variable-speed compressors, an intermediate cooling steady-state test shall be conducted in which the unit shall be operated at a constant, intermediate compressor speed (k = i) in which the dry/bulb and wet-bulb temperatures of the air entering the indoor coil are 80°F_{DB} and 67°F_{WB} and the outdoor coil are 87°$_{DB}$ and 69°F_{WB}. The tolerances for the dry-bulb and wet-bulb temperatures of the air entering the indoor and outdoor coils shall be the test operating tolerance and test condition tolerance specified in Table 6.1.1 of this Appendix. The intermediate compressor speed shall be the minimum compressor speed plus one-third the difference between the maximum and minimum speeds of the cooling mode. (Inter. speed = min. speed + ⅓ (max. speed − min. speed.) A tolerance of plus five percent or the next higher inverter frequency step from that calculated is allowed.

4.1.1.5 *Testing procedures for split-type ductless systems.* Cyclic tests of ductless units will be conducted without dampers. The data cycle shall be preceded by a minimum of two cycles in which the indoor fan cycles on and off with the compressor. For the data cycle the indoor fan will operate three minutes prior to compressor cut-on and remain on for three minutes after compressor cut-off. The integration time for capacity and power shall be from compressor cut-on time to indoor fan cut-off time. The fan power for three minutes after compressor cut-off shall be added to the integrated cooling capacity.

* * * * *

4.2 *Testing procedures for air source heating only units.*

* * * * *

4.2.1.2 * * *

The cycle times for variable-speed units is the same as the cyclic time in the cooling mode as specified in section 4.1.1.2 of this Appendix. Cyclic tests of split-type ductless units will be conducted without dampers, and the data cycle shall be preceded by a minimum of two cycles in which the indoor fan cycles on and off with the compressor. During the data cycle for the split type ductless units, the indoor fan will operate three minutes prior to compressor "cut-on" and remain on for three minutes after compressor "cut-off". The integration time for capacity and power will be from compressor "cut-on" time to indoor fan "cut-off" time. The fan power for the three minutes after compressor "cut-off" shall be subtracted from the integrated heating capacity. For split-type ductless systems which turn the indoor fan off during defrost, the indoor supply duct shall not be blocked.

4.2.1.3 * * *

For units with variable-speed compressors, the frost accumulation test at the intermediate speed shall be conducted such that the unit will operate at a constant, intermediate compressor speed (k = i) as determined in section 4.1.1.4 of this Appendix. The following two equations may be used in lieu of the frost accumulation test for variable-speed.

$$(a)\quad Q_{def}^{k=2}(35) = 0.90 \times [Q_{ss}^{k=2}(17) + (Q_{ss}^{k=2}(47) - Q_{ss}^{k=2}(17))] \times (35-17)/(47-17)$$

$$(b)\quad E_{def}^{k=2}(35) = 0.985 \times [E_{ss}^{k=2}(17) + (E_{ss}^{k=2}(47) - E_{ss}^{k=2}(17))] \times (35-17)/(47-17)$$

* * * * *

5.1.5 *Seasonal energy efficiency ratio for air-source units with triple-capacity compressors.* (Reserved)

5.1.6 *Seasonal energy efficiency ratio for air-source units with variable-speed compressors.* For air-source units with variable-speed compressors, the sasonal energy efficiency ratio (SEER), shall be defined as follows:

$$SEER = \frac{\sum_{j=1}^{8} \frac{Q(T_j)}{N}}{\sum_{j=1}^{8} \frac{E(T_j)}{N}}$$

where the number of hours in the j^{th} temperature bin $(n_j)/N$ is defined in Table 6.1.2 of this Appendix.

The SEER shall be determined by evaluating three cases of the compressor operation. Case I is the same as specified in 5.1.3.1 with the exception that the quantities $Q_{ss}^{k=1}(T_j)$ and $E_{ss}^{k=1}(T_j)$ shall be calculated by the following equations:

$$Q_{ss}^{k=1}(T_j) = Q_{ss}^{k=1}(82\ F) + \frac{Q_{ss}^{k=1}(67\ F) - Q_{ss}^{k=1}(82\ F)}{82 - 67} \times (82 - T_j)$$

$$E_{ss}^{k=1}(T_j) = E_{ss}^{k=1}(82\ F) + \frac{E_{ss}^{k=1}(67\ F) - E_{ss}^{k=1}(82\ F)}{82 - 67} \times (82 - T_j)$$

Case II is when the compressor operates at any intermediate (k=v) speed between the maximum (k=2) and minimum (k=1) speeds to satisfy the building cooling load. Evaluate the following equations:

$$Q_{ss}^{k=v}(T_j) = BL\ (T_j)$$

$$E_{ss}^{k=v}(T_j) = \frac{Q_{ss}^{k=v}(T_j)}{EER_{ss}^{k=v}(T_j)}$$

$$\frac{Q(T_j)}{N} = Q_{ss}^{k=v}(T_j) \times \frac{n_j}{N}$$

$$\frac{E(T_j)}{N} = E_{ss}^{k=v}(T_j) \times \frac{n_j}{N}$$

where $E_{ss}^{k=v}(T_j)$ the electrical power input required by the unit to deliver capacity matching the building load at temperature T_j.

where $Q_{ss}^{k=v}(T_j)$ = the capacity delivered by the unit matching the building load at temperature T_j.

$EER_{ss}^{k=v}(T_j)$ = the steady-state energy efficiency ratio at temperature T_j and an intermediate speed at which the unit capacity matches the building load.

Before the steady-state intermediate speed energy efficiency ratio, $EER_{ss}^{k=v}(T_j)$, can be calculated, the unit performance has to be evaluated at the compressor speed (k=i) at which the intermediate speed test was conducted. The capacity of the unit at any temperature T_j when the compressor operates at the intermediate speed (k=i) may be determined by:

$$Q_{ss}^{k=i}(T_j) = Q_{ss}^{k=i}(87) + M_Q\ (T_j - 87)$$

Where:

$Q_{ss}^{k=i}(87)$ = the capacity of the unit at 87°F determined by the intermediate cooling steady-state test.

M_Q = slope of the capacity curve for the intermediate compressor speed (k=i)

$$M_Q = \frac{Q_{ss}^{k=1}(82) - Q_{ss}^{k=1}(67)}{82 - 67} \times (1 - N_Q) + N_Q \times \frac{Q_{ss}^{k=2}(95) - Q_{ss}^{k=2}(82)}{95 - 82}$$

$$N_Q = \frac{Q_{ss}^{k=i}(87) - Q_{ss}^{k=1}(87)}{Q_{ss}^{k=2}(87) - Q_{ss}^{k=1}(87)}$$

Once the equation for $Q_{ss}^{k=i}(T_j)$ has been determined, the temperature where $Q_{ss}^{k=i}(T_j) = BL(T_j)$ can be found. This temperature is designated as (T_{vc}). The electrical power input for the unit operating at the intermediate compressor speed (k=i) and the temperature (T_{vc}) is determined by:

$$E_{ss}^{k=i}(T_{vc}) = E_{ss}^{k=i}(87) + M_E\ (T_{vc} - 87)$$

where:

$E_{ss}^{k=i}(87)$ = the electrical power input of the unit at 87°F determined by the intermediate cooling steady-state test

M_E = scope of the electrical power input curve for the intermediate compressor speed (k=i)

$$M_E = \frac{E_{ss}^{k=1}(82) - E_{ss}^{k=1}(67)}{82 - 67} \times (1 - N_E) + N_E \frac{E_{ss}^{k=2}(95) - E_{ss}^{k=2}(82)}{95 - 82}$$

$$N_E = \frac{E_{ss}^{k=i}(87) - E_{ss}^{k=1}(87)}{E_{ss}^{k=2}(87) - E_{ss}^{k=1}(87)}$$

The energy efficiency ratio of the unit, $EER_{ss}(T_{vc})$, at the intermediate speed (k=i) and temperature T_{vc} can be calculated by the equation:

$$EER_{ss}^{k=i}(T_{vc}) = \frac{Q_{ss}^{k=i}(T_{vc})}{E_{ss}^{k=i}(T_{vc})}$$

Similarly, energy efficiency ratios at temperatures T_1 and T_2 can be calculated by the equations:

$$EER_{ss}^{k=1}(T_1) = \frac{Q_{ss}^{k=1}(T_1)}{E_{ss}^{k=1}(T_1)}$$

$$EER_{ss}^{k=2}(T_2) = \frac{Q_{ss}^{k=2}(T_2)}{E_{ss}^{k=2}(T_2)}$$

where:

T_1 = temperature at which the unit, operating at the minimum compressor speed, delivers capacity equal to the building load ($Q_{ss}^{k=1}(T_1) = BL(T_2)$), found by equating the capacity equation [$Q_{ss}^{k=1}(T_j)$] and building load equation [BL (T_j)] in section 5.1.3 and solving for temperature.

T_2 = temperature at which the unit, operating at the maximum compressor speed, delivers capacity equal to the building load ($Q_{ss}^{k=2}(T_2) = BL(T_2)$), found by equating the capacity equation [$Q_{ss}^{k=2}(T_j)$] and the building equation [BL (T_j)] in section 5.1.3 and solving for temperature.

$EER_{ss}^{k=1}(T_1)$ = the steady state energy efficiency ratio at the minimum compressor speed at temperature T_1.

$EER_{ss}^{k=2}(T_2)$ = the steady state energy efficiency ratio at the maximum compressor speed at temperature T_2.

$E_{ss}^{k=1}(T_1)$ = the electrical power input at the minimum compressor speed at temperature T_1, calculated by the equation in section 5.1.3.

$E_{ss}^{k=2}(T_2)$ = the electrical power input at the maximum compressor speed at temperature T_2, calculated by the equation in section 5.1.3.

The energy efficiency ratio, $EER_{ss}^{k=v}(T_j)$, shall be calculated by the following equation:

$$EER_{ss}^{k=v}(T_j) = A + B \times T_j + C \times T_j^2$$

where coefficients A, B, and C shall be evaluated using the following calculation steps:

$$D = \frac{T_2^2 - T_1^2}{T_{vc}^2 - T_1^2}$$

$$B = \frac{EER_{ss}^{k=1}(T_1) - EER_{ss}^{k=2}(T_2) - D\,(EER_{ss}^{k=1}(T_1) - EER_{ss}^{k=i}(T_{vc}))}{T_1 - T_2 - D \times (T_1 - T_{vc})}$$

$$C = \frac{EER_{ss}^{k=1}(T_1) - EER_{ss}^{k=2}(T_2) - B \times (T_1 - T_2)}{T_1^2 - T_2^2}$$

$$A = EER_{ss}^{k=2}(T_2) - B \times T_2 - C \times T_2^2$$

Case III is the same as specified in 5.1.3.4. The quantities $Q_{ss}^{k=1}(T_j)$ and $E_{ss}^{k=2}(T_j)$ shall be calculated by the equations prescribed in 5.1.3.

5.1.7 *Seasonal energy efficiency ration for split-type ductless systems.* For split-type ductless systems, SEER shall be defined as specified in section 5.1.1 of this Appendix for each combination set of indoor coils to be used with a common outdoor unit.

5.2 * * *

For air-source units that are equipped with "demand defrost control systems", the value for HSPF, as determined above shall be multiplied by an enhancement factor F_{def} to compensate for improved performance not measured in the Frost Accumulation Test. The factor, F_{def} depends on the number of defrost cycles in a 12-hour period and should be calculated as follows:

$F_{def} = 1 + 0.03 \times (1 - (T_{test} - 90)/(T_{max} - 90))$

where:

F_{def} = demand defrost credit (used as a multiplier to HSPF)

T_{test} = time between defrost terminations in minutes or 90, (whichever is greater)

T_{max} = maximum time between defrosts allowed by controls, (in minutes or 720 (whichever is less)

* * * * *

5.2.3 *Heating seasonal performance factor for air-source units with triple-capacity compressors.* (Reserved)

5.2.4 *Heating seasonal performance factor for units with variable-speed compressors.* For units with variable-speed compressors, the heating seasonal performance factor (HSPF) is defined by the following equation:

$$HSPF = \frac{\sum_j \frac{n_j}{N} \; BL(T_j)}{\left(\sum_j \frac{E(T_j)}{N} + \sum_j \frac{RH\ (T_j)}{N}\right)}$$

where: all symbols in the above equations are as defined in 5.2.2.

The minimum and maximum heating design requirements, DHR_{min} and DHR_{max}, which a variable-speed heat pump is likely to encounter, shall be evaluated as described for two-speed units in 5.2.2. with the option of using the nominal capacity, $Q_{ss}^{k=n}(47°\ F)$, in lieu of the maximum speed capacity, $Q_{ss}^{k=2}(47)$, in the prescribed equations if the manufacturer performed the nominal capacity test.

In evaluation of HSPF, three cases are considered, the quantities $E\ (T/N_j)$ and $RH(T/N_j)$ shall be calculated depending on compressor mode of operation.

Case I

The compressor operates at the minimum speed (k = 1) for which the building heating load, $BL(T_j)$, is less than or equal to the heating capacity, $Q_{ss}^{k=1}(T_j)$.

Calculations shall be performed as prescribed for two-speed systems in Case I of 5.2.2. with the exception that system capacity $Q_{ss}^{k=1}(T_j)$, and power, $E_{ss}^{k=1}(T_j)$, shall be calculated by the following equeations:

$$Q_{ss}^{k=1}(T_j) = Q_{ss}^{k=1}(47) + \frac{Q_{ss}^{k=1}(62) - Q_{ss}^{k=1}(47)}{15} \times (T_j - 47)$$

$$E_{ss}^{k=1}(T_j) = E_{ss}^{k=1}(47) + \frac{E_{ss}^{k=1}(62) - E_{ss}^{k=1}(47)}{15} \times (T_j - 47)$$

Case II

The compressor operates at any intermediate (k = v) speed between the maximum speed (k = 2) and minimum (k = 1) speed to satisfy the building load.

Evaluate the following equations:

$$Q^{k=v}(T_j) = BL(T_j)$$

$$\frac{Q(T_j)}{N} = Q^{k=v}(T_j) \times \frac{n_j}{N}$$

$$E^{k=v}(T_j) = \frac{Q^{k=v}(T_j)}{3.413 \times COP^{k=v}(T_j)}$$

$$\frac{E(T_j)}{N} = E^{k=v}(T_j) \times \frac{n_j}{N}$$

where:

$Q^{k=v}(T_j)$ = capacity delivered by the unit at any intermediate speed between the minimum and maximum compressor speed matching the building load at temperature T_j

$E^{k=v}(T_j)$ = the electrical power input required by the unit at temperature T_j to deliver capacity matching the building load

$COP^{k=v}(T_j)$ = the coefficient of performance at which the unit delivers capacity matching the building load at temperature T_j

Before the coefficient of performance, $COP^{k=v}(T_j)$, can be calculated, the unit performance has to be evaluated at the compressor speed (k = i) at which the intermediate speed test was conducted. The capacity of the unit at any temperature T when compressor operates at the

intermediate speed (k=i) may be determined by:

$Q_{def}^{k=i}(T_j) = Q_{def}^{k=i}(35) + M_Q(T_j - 35)$

where:

$Q_{def}^{k=i}(35)$ = the capacity of the unit at 35°F determined at the intermediate compressor speed (k=i) in the frost accumulation test

M_Q = slope of the capacity curve for the intermediate compressor speed (k=i)

$$M_Q = \frac{Q_{ss}^{k=1}(62) - Q_{ss}^{k=1}(47)}{62 - 47} \times (1 - N_Q) + N_Q \frac{Q_{def}^{k=2}(35) - Q_{ss}^{k=2}(17)}{35 - 17}$$

$$N_Q = \frac{Q_{def}^{k=i}(35) - Q_{ss}^{k=1}(35)}{Q_{def}^{k=2}(35) - Q_{ss}^{k=1}(35)}$$

Once the equation for $Q^{k=i}(T_j)$ has been determined, the temperature where $Q_{def}^{k=i}(T_j) = BL(T_j)$ can be found. This temperature is designated at T_{vh}. A separate T_{vh} shall be determined for each design heating requirement.

The electrical power input for the unit operating at the intermediate compressor speed (k=v) and at the temperature (T_{vh}) is determined by:

$E_{def}^{k=i}(T_{vh}) = E_{def}^{k=i}(35) + M_E(T_{vh} - 35)$

where:

$E_{def}^{k=i}(35)$ = the electrical power input of the unit at 35 °F determined at the intermediate compressor speed (k=i) in the frost accumulation test

M_E = slope of the electrical power input curve for the intermediate compressor speed (k=i)

$$M_E = \frac{E_{ss}^{k=1}(62) - E_{ss}^{k=1}(47)}{62 - 47} \times (1 - N_E) + N_E \frac{E_{def}^{k=2}(35) - E_{ss}^{k=2}(17)}{35 - 17}$$

$$N_E = \frac{E_{def}^{k=i}(35) - E_{ss}^{k=1}(35)}{E_{def}^{k=2}(35) - E_{ss}^{k=1}(35)}$$

The coefficient of performance, $COP^{k=i}(T_{vh})$, at the intermediate speed (k=i) and temperature T_{vh} can be calculated by the equation:

$$COP^{k=i}(T_{vh}) = \frac{Q_{def}^{k=i}(T_{vh})}{3.413 \times E_{def}^{k=i}(T_{vh})}$$

Similarly, coefficients of performance at temperature T_3 and T_4 can be calculated by the equations:

$$COP^{k=1}(T_3) = \frac{Q^{k=1}(T_3)}{3.413 \times E^{k=1}(T_3)}$$

$$COP^{k=2}(T_4) = \frac{Q^{k=2}(T_4)}{3.413 \times E^{k=2}(T_4)}$$

where:

T_3 = temperature at which the unit, operating at the minimum compressor speed, delivers capacity equal to the building load ($Q^{k=1}(T_3) = BL(T_3)$), found by equating the capacity equation $Q^{k=1}(T_j)$ (at T_j 40°F) equal to the building load equation $BL(T_j)$ as identified in section 5.2.2 of this Appendix and solving for temperature

T_4 = temperature at which the unit, operating at the maximum, delivers capacity equal to the building load ($Q^{k=2}(T_4) = BL(T_4)$), found by setting the equation for capacity $Q^{k=2}(T_j)$ equal to the equation for building load $BL(T_j)$ from the two-speed procedure in section 5.2.2 and solving for temperature

$COP^{k=1}(T_3)$ = the coefficient of performance at the minimum compressor speed at temperature T_3

$COP^{k=2}(T_4)$ = the coefficient of performance at the minimum compressor speed at temperature T_4

$Q^{k=1}(T_3)$ = steady-state capacity at the minimum compressor speed at temperature T_3, using equations for $Q^{k=1}(T_j)$ from the two-speed procedure

$Q^{k=2}(T_4)$ = steady-state capacity at the maximum compressor speed at temperature T_4, calculated using the equations $Q^{k=2}(T_j)$ of the two-speed procedure

$E^{k=1}(T_3)$ = the electrical power input at the minimum compressor speed at temperature T_3, calculated by using the equation for $E^{k=1}(T_j)$ (where $T_j \geq 40$ °F) from the two-speed procedure in section 5.2.2 of this Appendix

$E^{k=2}(T_4)$ = the electrical power input at the maximum compressor speed at temperature T_4, calculated by using the equation for $E^{k=2}(T_j)$ from the two-speed procedure in section 5.2.2 of this Appendix

The coefficient of performance, $COP^{k=v}(T_j)$, shall be calculated by the following equation:

$COP^{k=v}(T_j) = A + B \times T_j + C \times T_j^2$

where coefficients A, B and C shall be evaluated using the following calculations step:

$$D = \frac{T_3^2 - T_4^2}{T_{vh}^2 - T_4^2}$$

$$B = \frac{COP^{k=2}(T_4) = COP^{k=1}(T_3 - D \times [COP^{k=2}(T_4) - COP^{k=i}(T_{vh})]}{T_4 - T_3 - D \times (T_4 - T_{vh})}$$

$$C = \frac{COP^{k=2}(T_4) - COP^{k=1}(T_3) - B \times (T_4 - T_3)}{T_4^2 - T_3^2}$$

$$A = COP^{k=2}(T_4) - B * T_4 - C \times T_4^2$$

Case III

The compressor operates at the maximum speed (k=2) for which the building heating load, $BL(T_j)$, is greater than or equal to the heating capacity, $Q_{ss}^{k=2}(T_j)$.

Calculations shall be performed as prescribed for two-speed systems in Case IV of 5.2.2

5.2.5. *Heating seasonal performance factor for split-type ductless systems.* For split-type ductless systems, HSPF shall be defined as specified in section 5.2.1 of this Appendix. Separate values of HSPF shall be determined for each corresponding combination set of indoor coils used in the development of SEER as specified in section 5.1.7. The calculations used shall be the same as those used for unit with the same type of compressor.

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[FR Doc. 88-5288 Filed 3-11-88; 8:45 am]

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Federal Register

Monday
March 14, 1988

Part III

Department of Labor

Occupational Safety and Health Administration

29 CFR Part 1910

Presence Sensing Device Initiation of Mechanical Power Presses; Final Rule

DEPARTMENT OF LABOR

Occupational Safety and Health Administration

29 CFR Part 1910

Presence Sensing Device Initiation of Mechanical Power Presses

AGENCY: Occupational Safety and Health Administration, Labor.

ACTION: Final rule.

SUMMARY: The Occupational Safety and Health Administration (OSHA) is amending its standard for mechanical power presses, 29 CFR 1910.217, Subpart O, to allow (but not require) presence sensing device initiation (PSDI) on certain types of power presses. The amended standard addresses the use of presence sensing devices as well as the entire mechanical power press safety system involved in operating in the PSDI mode. OSHA is also amending the related standard on definitions, 29 CFR 1910.211, as appropriate, to support the revision to the mechanical power press standard.

Until this rulemaking, OHSA did not permit PSDI, but rather required that a mechanical power press operator physically initiate the stroke of the press by using hand controls or a foot pedal. The specific prohibition against PSDI was contained in 29 CFR 1910.217(c)(3)(iii)(*b*).

Because presence sensing device initiation has been used safely in other countries, in one case for over 30 years, and on an experimental basis in the United States since 1976, OSHA believes this prohibition is technically outdated and that PSDI, overall, enhances employee safety. This revision allows a presence sensing device to initiate the stroke of the press automatically when the operator's body is out of the danger zone.

DATE: Appendix C of this final rule will become effective on April 13, 1988 and the balance of this final rule will become effective June 13, 1988. See also "Effective Date" section in **SUPPLEMENTARY INFORMATION.**

ADDRESS: For additional copies of this standard contact: U.S. Department of Labor, Occupational Safety and Health Administration, Office of Publications, Room N–3101, Washington, DC 20210, (202) 523–9667.

FOR FURTHER INFORMATION CONTACT: James Foster, U.S. Department of Labor, Occupational Safety and Health Administration, Office of Information and Consumer Affairs, Room N–3637, Washington, DC 20210, (202) 523–8148.

SUPPLEMENTARY INFORMATION: This notice of final rulemaking has been prepared by Carrol Burtner and Judy Goodrich of the Office of Mechanical Engineering Safety Standards.

I. Background

A mechanical power press is a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. While PSDI will likely have wider application for presses that perform metal stamping operations, any mechanical power press use for materials other than metal may also be considered for PSDI.

A press consists of a stationary bed or anvil, and a slide having a controlled reciprocating motion. The slide, called the ram, is equipped with special punches and moves downward into a die block which is attached to the rigid bed. The punches and the die block assembly are generally referred to as a "die set." The main function of a stamping press is to provide sufficient power to close and open the die set, thus shaping or cutting the metal part set on the die block. The metal part is fed into the die block and the ram descends to perform the desired stamping operation. The danger zone for the operator is between the punches and the die block. This area is referred to as the "point of operation."

Other major components of a mechanical power press, apart from the frame, are the driving motor, the flywheel, the clutch and brake. The flywheel, a large rotating mass powered by the driving motor, transmits energy to the working elements by means of an eccentric (a mechanism which converts circular motion to linear motion), a crankshaft, or other means. The function of the clutch is to connect the rotating flywheel with the crankshaft causing the press to stroke.

The clutch on mechanical power presses is usually either a full-revolution clutch or part-revolution clutch. A full-revolution clutch transfers motion from the flywheel to the ram through a mechanical connector. The connection cannot be broken until one full revolution has been completed. A part-revolution clutch is also referred to as a friction clutch. Motion is transmitted by two pieces of material being pushed against one another. This type of clutch can be disengaged at any time.

The function of the brake is to stop the motion of the ram. The brake may be a constant drag-type (typical on a full-revolution clutch machine), or it may be engaged only while the clutch is disengaged (typical with part-revolution clutch machines). A brake may be a separate unit, or it may be incorporated in a combination unit with the clutch (applies only to friction clutches).

The feeding of the press is the process of placing material in or removing material from the point of operation. It is done by one of the following methods:

Automatic Feeding—the material or part being processed is placed within and removed from the point of operation by mechanical or machine-operated means. An operator is not required to initiate each stroke of the press.

Semiautomatic Feeding—the material or part being processed is placed within or removed from the point of operation by an auxiliary means *controlled* by the operator on each stroke of the press.

Manual Feeding—the material or part being processed is handled by the operator (with or without use of a grasping hand tool) on each stroke of the press.

In manually-fed operations, tools can be used to place the part in the die bed such that the operator's hands need never be in the point of operation. This is known as "no-hands-in-die" (NHID). Parts can also be fed without using tools. This latter method is referred to as "hands-in-die" (HID) because the operator's hands actually reach into the point of operation. *PSDI is mainly considered for manually-fed operations.*

Until this rulemaking, OSHA standards have required that a mehanical power press operator *physically initiate* the stroke of a power press by making bodily contact with the operating control (normally a hand or foot control) to "tell" the press to stroke. A special and *overt* action of the operator was necessary for the press to stroke.

The total population of mechanical power presses in the United States is estimated to be 230,000, about equally divided between full revolution and part revolution presses. Approximately 69,000 of the 115,000 part revolution presses are manually fed, the balance being machine fed. It is estimated that 40 percent of the manually fed presses are operated by hand controls and the remaining 60 percent are operated by foot controls.

Figure 1 illustrates a common type of mechanical power press. Note the dual palm buttons and the foot pedal that require direct bodily contact in order to initiate the stroke of the press.

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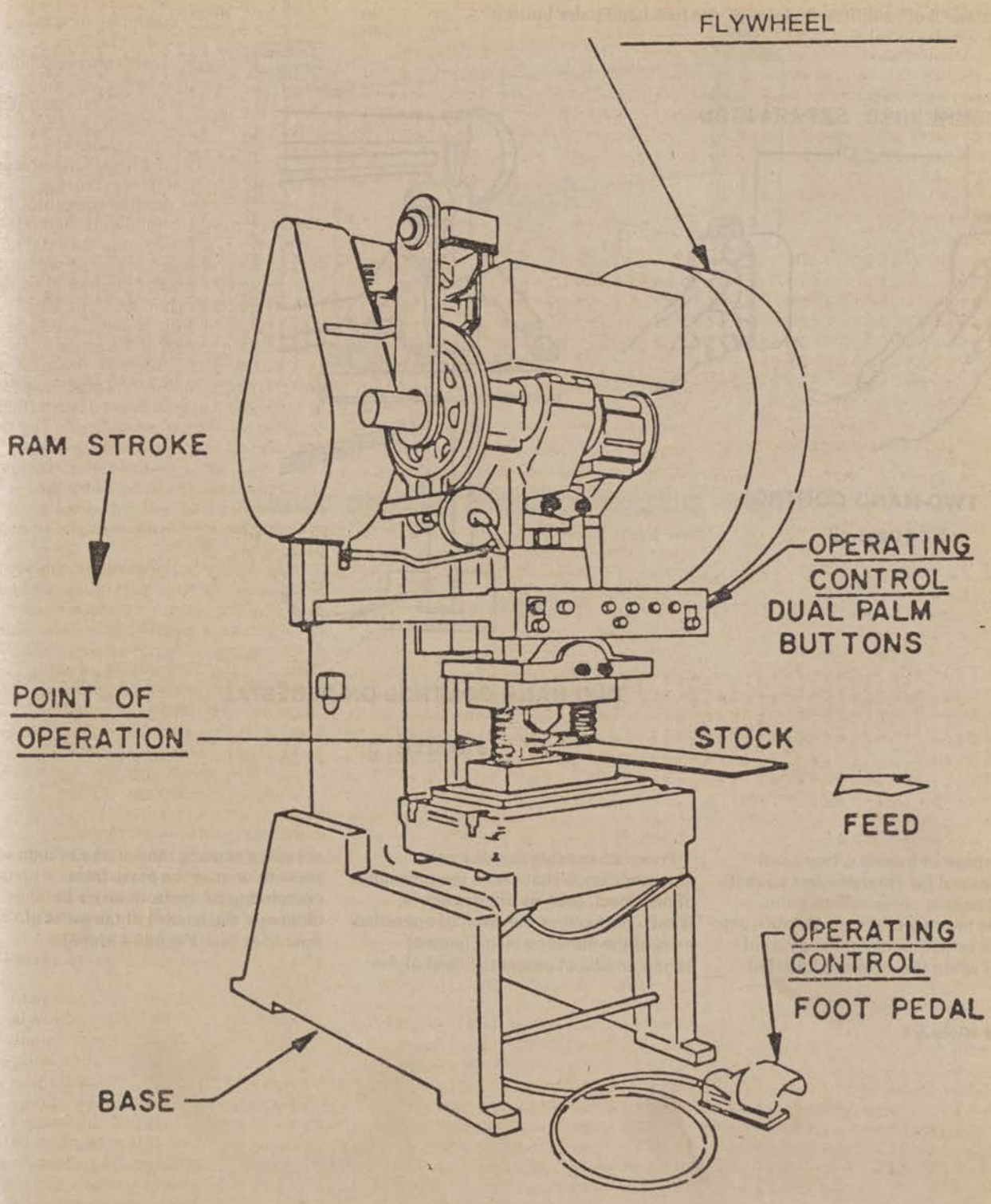

MECHANICAL POWER PRESS
(OBI)

FIGURE 1

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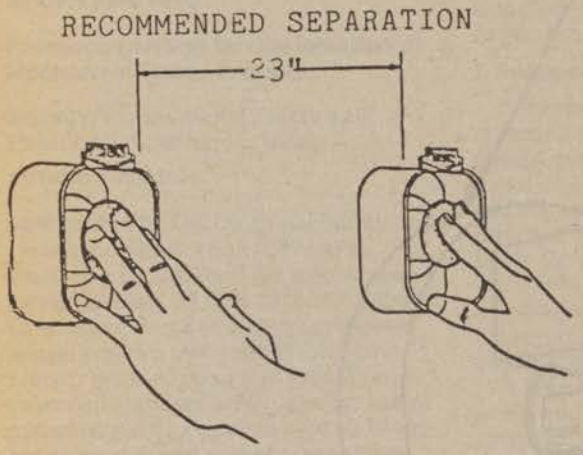
Figures 2 and 3 offer different views of the two-hand palm buttons.



TWO-HAND CONTROL

Figure 2

TWO-HAND CONTROL ON PEDESTAL

Figure 3

The purpose of having a two-hand control, spaced far enough apart so that one hand cannot operate both palm buttons, is to prevent the employee from having his or her hands in the point of operation when the stroke is initiated.

Presence sensing devices are electronic units that sense the presence of an object, such as an operator's hands, that enters the point of operation area of the machine (see Figure 4). When an object enters the field of the presence sensing device, the system will prevent or stop the press from completing its cycle, in order to eliminate the hazard at the point of operation (see Figures 4 and 5).

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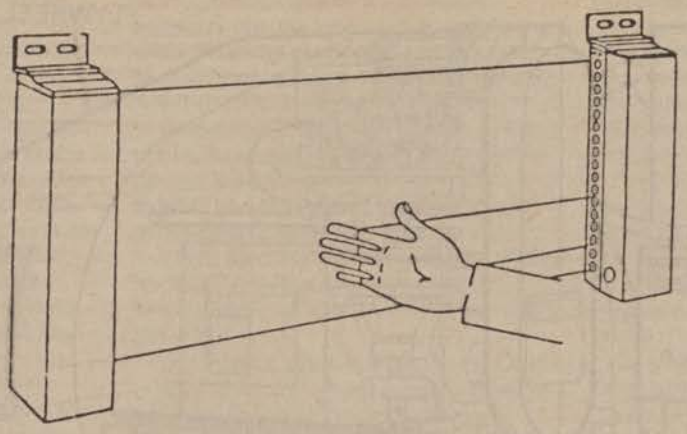
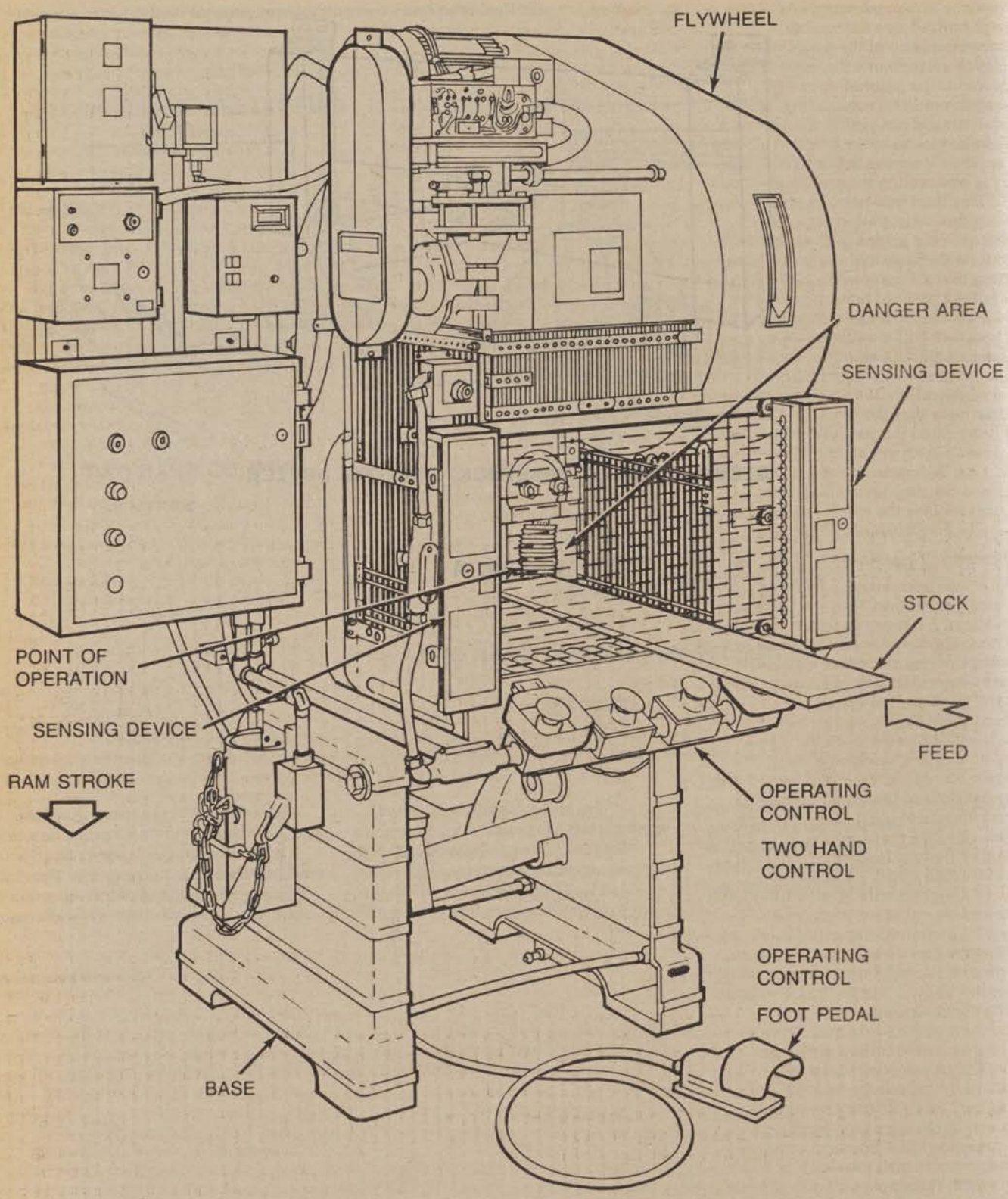


LIGHT CURTAIN PRESENCE SENSING DEVICE

FIGURE 4



MECHANICAL POWER PRESS WITH PRESENCE SENSING DEVICE

FIGURE 5

BILLING CODE 4510-26-C

Presence sensing devices have long been permitted as a safeguard to prevent operation of the press when the employee's hands or other part of the body are at the point of operation. However, until this rulemaking, OSHA regulations did not permit the presence sensing device to initiate a stroke of the press when it senses that no part of the body is obstructing the presence sensing field. This final rule permits presence sensing device initiation—a system which uses the presence sensing device to initiate the stroke of the press upon sensing that all parts of the body are clear of the point of operation. The device also must sense that all parts of the body are sufficiently far away so that accidental action of the employee cannot expose parts of the body to the point of operation during the stroke, or alternatively that the stroke of the press can be stopped if a part of the employee's body reenters the point of operation. Initiation of the stroke by the presence sensing device makes it unnecessary for the employee to initiate manually the stroke of the press.

A. History of Regulation

PSDI was introduced in West Germany in 1953. In 1971, the Federal Republic of Germany developed the "German Basic Rules for Presence Sensing Devices on Power Operated Presses in the Metalwork Industry" and in 1973, the National Board of Occupational Safety and Health in Sweden developed standards which apply to oversee safety and health in Sweden, Denmark, Finland, Iceland and Norway. Both of these regulations permit the use of PSDI. In the United States, the 1971 revision of the American National Standards Institute voluntary consensus standard, ANSI B11.1, "Safety Requirements for Construction, Care and Use of Mechanical Power Presses," permitted the use of presence sensing devices as safeguards to stop the press if the employee placed part of his or her body in the point of operation during the stroke. However, the standard prohibited their use as a tripping means to initiate the press cycle. OSHA adopted the ANSI standard in its entirety as a Federal regulation (29 CFR 1910.217) in 1971. This action changed the prohibition against using PSDI from a voluntary consensus standard provision to a rule with which the employer was *required* to comply, regardless of preferences, capabilities or changes in technology.

The prohibition was continued to subsequent issues of the ANSI standard. Although not a factor in the OSHA decisional process, in working drafts of revisions to the ANSI standard subsequent to OSHA's published proposal, the prohibition has been deleted. In the comments on the proposal which were received from the ANSI B11.1 subcommittee (Ex. 18–14), it is stated that PSDI will be considered in the forthcoming revision of the standard for mechanical power presses. This exhibit and the other exhibit numbers mentioned may be found in Docket No. S–225 in the OSHA Docket Office, Room N–3670, U.S. Department of Labor, Washington, DC 20210. Telephone: (202) 523–7894.

The ANSI standard adopted by OSHA in 1971 also contained a requirement of "no-hands-in-die." In 1974, through rulemaking under section 6(b) of the Act, OSHA revoked the no-hands-in-die requirement because evidence indicated it did not lead to greater safety and because of feasibility difficulties. OSHA added protective provisions when hands-in-die feeding is used, in order to increase safety (39 FR 41844) (Ex. 14). Further discussion on this subject can be found in Section II, "Public Response."

At that time, OSHA considered but rejected the possibility of deleting the prohibition against using presence sensing devices as a tripping mechanism on mechanical power presses. The rejection was based on the evidence available at the time and in part on the fact that while European countries which authorize this method have procedures and facilities for approval of the presence sensing devices, OSHA did not have the capability for such approval. However, OSHA further stated that the requirement might be reconsidered if a satisfactory means of approval and a regulation could be implemented, and that new evidence indicating the safety of PSDI would of course lead to reconsideration of the earlier decision.

OSHA granted a variance permitting the use of PSDI on an experimental basis to the Interlake Stamping Corporation of Willoughby, Ohio, on August 31, 1976 (41 FR 36703, August 31, 1976) (Ex. 15). It was the opinion of OSHA that the PSDI system might well prove to be an improved safety technique, based on a document submitted by the Swedish National Board of Industrial Safety. OSHA stated, "Their [the National Board] experience has shown no accidents related to the functioning of the light curtain in this mode. It further appears that the simplicity of the system would reduce worker fatigue, a recognized cause of industrial accidents, by eliminating the need for the press operator to manually operate a two-hand control, foot pedal, or other permissible tripping device. In addition, minimizing the operator's task would appear to eliminate an inclination to bypass or inactivate the safeguard. Thus, accidents from these causes could be reduced or eliminated" (41 FR 36703; August 31, 1976) (Ex. 15).

The Interlake Stamping Company variance was the subject of a study done by the Purdue Research Foundation in 1982 under a contract for the National Institute for Occupational Safety and Health (NIOSH) (Exs. 6, 7, 8, 9, 10).

In 1982, OSHA contracted with Mr. Trygve Hauge of Technology 80, Inc., to examine 29 CFR 1910.217 and to recommend appropriate revisions to the standards to allow PSDI. Hauge's report, "Self-Tripping of Mechanical Power Presses" (Ex. 1), contains supporting information and recommended revisions and additions to existing regulations.

Approximately 350 copies of the report were distributed in June 1983 to individuals and organizations that are members of pertinent voluntary consensus standards organizations; that have participated in a previous rulemaking relating to 29 CFR 1910.217; or that otherwise have demonstrated interest in the subject. Critical comments and suggestions were invited on the draft of changes to the standard. There were 55 public comments on the report. They were entered into the record of the proposed rulemaking as Exhibits 4–1 through 4–55.

Based on these studies, the experience under the variance and in Europe, the preproposal comments and other information, OSHA proposed to delete the prohibition on PSDI and incorporate regulatory provisions so that PSDI would be used in a safe manner. The proposal appeared in the **Federal Register** on March 29, 1985, at 50 FR 12700 (Ex. 20). The proposal requested public comments which were due within 90 days, by June 27, 1985. OSHA received 83 comments in response to the proposal (Exs. 18–1 to 18–83).

OSHA also notified the public of its right to request an informal public hearing. Two parties tentatively indicated an interest in holding a hearing. However, after discussions and agreement that there was sufficient information in the record, the hearing requests were withdrawn. No other requests for hearings were received.

B. Basis for Proposal

The principal basis of OSHA's proposal was the growing body of evidence indicating that PSDI could be used safely. Since the 1974 decision to retain the prohibition against using

presence sensing devices as tripping mechanisms on mechanical power presses, the experimental variance and several studies added much to the background information and understanding of operating presses with presence sensing devices. These studies and the variance operating results indicated the use of properly designed light curtain type presence sensing devices used in the PSDI mode to be extremely safe, and to have the added benefits of lessening operator fatigue, thus further enhancing safety. The studies suggested that the OSHA requirements for manual tripping may be an unnecessary prohibition which imposes a burden on business and provides no increased safety to employees.

As mentioned, OSHA granted a variance permitting the use of PSDI on an experimental basis to the Interlake Stamping Corporation (now Interlake Stamping of Ohio, Inc.) on August 31, 1976. The Interlake variance was designed to demonstrate a total safety system employing a light curtain type presence sensing device as a tripping mechanism, as it is used in other countries, and to validate the accident-free experience with this system. Detailed requirements were developed by Interlake to assure that the equipment would meet safety requirements equal to those contained in Swedish standards as well as pertinent OSHA standards. A light curtain type presence sensing device was used to function as a combined safeguard and tripping mechanism on five open back inclinable (OBI) mechanical power presses.

This light curtain device is part of a sophisticated control system which automatically checks all press systems between strokes. If any of the electronic or mechanical systems do not operate properly, the press will shut down without stroking. In addition, the press will automatically shut down if the brake does not stop the press within a pre-determined period, or if the operating rhythm is interrupted so that the press does not cycle within a pre-set time. Before the press can be operated again, necessary repairs or adjustments must be made, and special operating means must be actuated to restart the press.

The 1976 experimental variance has been renewed several times and is a very useful method for comparing the performance of PSDI to two-hand control or foot control initiation. In nearly a decade of continuous, carefully monitored use at Interlake, there have been no injuries in PSDI equipped presses.

The Interlake Stamping Corporation variance was also the subject of a study done by the Purdue Research Foundation under a contract for the National Institute for Occupational Safety and Health (NIOSH) (Exs. 6, 7, 8, 9, 10). As a result of this study, the researchers at Purdue recommended to OSHA that the prohibition be lifted against the use of fail-safe cycle initiation using presence sensing light curtain devices. The rationale for this recommendation was based on the finding that the two-hand palm button actuator system was no more safe than the tested light curtain device at Interlake Stamping. Although the two devices are equally safe to the operator, the PSDI system also protects all other personnel such as maintenance or servicing personnel who may be exposed at the point of operation (danger zone). The two-hand palm button device protects only the operator. The recommendation to remove the prohibition was qualified by additional recommendations related to certification of the safety of light curtains, installation, operation, maintenance, inspection, and operator training.

The previously mentioned OSHA contract with Mr. Trygve Hauge of Technology 80, Inc., was to examine 29 CFR 1910.217 and to recommend appropriate revisions to the standards to allow PSDI (then called "self-tripping"). Hauge's report, "Self Tripping of Mechanical Power Presses" (Ex. 1) concluded that the previous studies done on the European experience with PSDI and the operating variance in the United States were documented evidence that "the use of these devices in a self-tripping mode has been found to be equally safe plus have the added benefit of less operator fatigue and greater productivity."

OSHA preliminarily concluded that the studies and experimental variance had shown that PSDI overall enhances safety at the point of operation of part revolution mechanical power presses when compared with currently permitted actuation means and safeguarding methods. There were several reasons for this conclusion.

1. The press opeator is protected just as well with PSDI as with present stroke initiation methods.

2. In addition to the operator, presence sensing devices protect all others who intrude into the point of operation, as opposed to pull-outs, two-hand controls, and restraints, which protect only the operator.

3. Personnel who violate § 1910.217(d)(1)(ii) by attempting to remove scrap or stuck parts with their hands rather than with tools are also protected by PSDI.

4. The overall press and control system safety are enhanced by certification and related requirements to ensure a higher degree of equipment capability and reliability than was provided for in the former standard.

5. With PSDI, there is less operator fatigue than there is with manual controls because the repetitious reaching motions will be eliminated.

6. The previous requirements for training and maintenance have been enhanced to assure the safe use of PSDI.

7. The integral nature of the actuation and guarding device reduces human factors risk because the press cannot be operated without the presence sensing device in the PSDI mode. Presence sensing devices do not have to be removed at the completion of the stroke in order to gain access to the point of operation. Also, the devices do not physicially obstruct or interact directly with operators, so there is less tendency for operators to void this safeguarding device than there is with other types of guards, such as gate devices which can be removed; pull-out devices that are strapped to the hands in order to pull them out with the movement of the ram, but which can get out of adjustment with no notice to the operator; or restraint devices that restrict the movement of the hands.

For these reasons, OSHA published a proposed rule in order that the state-of-the-art in technological advancements may be recognized and be permitted to be utilized in a manner consistent with, and protective of, worker safety and health.

II. Public Response

A. General Issues on Whether OSHA Standards Should Permit Use of PSDI

OSHA received 83 comments to the proposed rule of March 29, 1985 (50 FR 12700) (Ex. 20). The comments addressed the issues on three levels. First, the general issue of whether OSHA regulations should permit the use of PSDI, second, specific questions relevant to the general issue, and third, if it is permitted, what specific technical provisions are appropriate to assure that PSDI is used safely. The immediately following discussion addresses the first issue: Should OSHA permit PSDI? Then follows a discussion of the specific questions about the general issue of the safety of PSDI. The third issue of specific technical provisions is

discussed later in this document under III. *Summary and Explanation of the Final Rule.*

The majority of the comments received stated general support for permitting the use of PSDI. For example, the Spiral Shim Company (Ex. 18–62) stated:

Our experience of 40 years in the metal stamping production has kept us on the search for improved safety, and we believe that a properly designed, installed, and maintained PSDI is a stepping stone to ever improved safety conditions.

That comment and the following comments generally represent the industries who will use PSDI. From the American Metal Stamping Association (EX. 18–64) came this request:

Please move quickly in implementing the PSDI regulation so employers can begin to implement this proven, accepted technology for improving operator safety and productivity.

From Alofs Manufacturing Company (Ex. 18–27) came this statement:

For the past few years we have been watching with interest the P.S.D.I. operation at a metal stamping plant in Ohio. While this device is new for our industry in the United States it has been in operation in Europe for many years. We support the P.S.D.I. concept and feel it will be one of the best improvements for our industry in some time.

Anchor Fabrication (Ex. 18–7) stated:

We favor adoption of the PSDI regulation for several reasons:

1. First, it is a proven system for increasing productivity. The system as you know has been used successfully in Europe for over twenty years.

2. Second, it promotes safety through increased reliability of controls and other machine components.

3. Finally, the certification programs help to insure that these technological improvements do not deteriorate through abuse nor neglect.

In summation, we feel that the opportunity to increase productivity, upgrade the quality of our national manufacturing capacity, while at the same time increasing the level of operator safety is too good a proposal not to try. Surely we can show ourselves to be as creative and responsible as our European trading partners and should be given an opportunity to implement this proposal.

Another commenter, the Olin Brass Corporation (Ex. 18–21), expressed support by stating:

In the case of PSDI, we have an opportunity to achieve efficiency and to improve the safety of the work place. This proposed standard should be implemented as soon as possible.

Another commenter, the Torrington Company (Ex. 18–15) supported the use of PSDI by stating:

Over the past few years we have had various strain injuries including tendonitis caused by repetitive contact with palm buttons. One case was severe enough to cause the operator to be permanently removed from the job. This proposed rule would eliminate this type of injury.

From Trans-Matic (Ex. 18–31), this comment was received:

The proposed PSDI legislation is long past due in the United States. This is not new technology, but firmly established, widely used and adequately tested technology implemented in other countries. The time has come for change. While I do not agree with every provision of this proposed legislation, I want to lend my personal and corporate support to his proposal. As presently drafted, the implementation of this legislation will assist U.S. manufacturers increase safety and productivity at the same time. Rarely do we have an opportunity to accomplish both goals concurrently.

and, the American Metalcraft Company (Ex. 18–47) stated:

Recently the metal stamping industry has perfected a technology which will greatly enhance press operator safety, presence sensing device initiation of power presses.

I totally support the efforts of my fellow manufacturers to work with the regulatory agencies to formulate a set of regulations to insure proper utilization of this technology by all manufacturers.

In contrast to the numerous favorable comments, there were some who expressed opposition to the use of PSDI. From the press manufacturers' comments, the following viewpoints were received:

It is because of our deep concern for operator safety that we object to this revision. We cannot sanction a proposal that transfers safety conditions from the operator to the press system—thereby placing the operator completely at the mercy of that system. (Niagara Machine and Tool Works (Ex. 18–50)).

It is true that PSDI has been used in Europe for many years. The history and statistics of the safe use of PSDI operated equipment are really unknown. The governmental regulations of European countries and their methods of enforcement of these regulations are considerably different from ours. It is also my understanding that the present use of PSDI on mechanical power presses is very limited. The majority of PSDI in Europe is involving hydraulic power presses, not mechanical power presses. (Minster Machine Company (Ex. 18–18)).

I fail to see any increase in operator safety when the press, not the operator, controls the cycling of the press. (Verson Press Manufacturing (Ex. 18–2)).

OSHA has considered all of the comments which were received and agrees with the supportive comments from those who will use PSDI on their presses that it can increase safety by protecting more than just the operator; eliminating strain injuries and fatigue; adding certification requirements; and enhancing the training and maintenance requirements for more protection than the current requirements for manual controls. These reasons are discussed at length both above and below in this document.

In specific response to the opposing comments, OSHA believes that safe use in Europe for over 30 years provides support for the safety of PSDI. Speculation on possible differences between Europe and American systems does not negate that history of safe use. OSHA regulations are enforceable and incorporation of a certification system in this regulation conforms to European practice. The European practice, variance and studies demonstrated that PSDI is as safe as manual actuation for the operator and safer for others in the work area.

The specific safe experience of Interlake Stamping (Ex. 18–63) also indicates that the general concerns of those opposing PSDI have not in practice caused problems. The comment from Interlake stated:

As you already know, our company is the only company allowed to permit this PSDI at the present time. Officially we have been using this PSDI since 1976 with a 100% safety record. All other good points of this PSDI are part of a record you already have. I am not only writing this for myself and my company but also for the many employees that have been involved in this operation over the past 9 years. They have endorsed the operation not only as a safety system but also from a productivity and from an ergonomic perspective.

The safe experience of those who have used PSDI is valuable in evaluating the comments from those who object to allowing the use of this new technology.

Based on the history of the safe use of PSDI in Europe, the experimental variance studies done by NIOSH which concluded that PSDI was equally as safe as manual controls, the added protection which it gives to others in the work area, the reasons previously stated and the ergonomics factors discussed, OSHA concludes that if the provisions of paragraph (h) and the certification requirements in the appendices are complied with, PSDI should be permitted. It is as least as safe for the operator and overall safer because of the protection it gives others.

This conclusion has been reinforced by the consultants with experience in this area of technology; Trygve Hauge of Technology 80, Inc. (Ex. 1), James Barrett, Jr., of Link Systems (Ex. 12), and Sergio Concha, Paser Associates (Ex. 11), who were contracted by OSHA to give expert advice on the subject of PSDI and recommended its adoption, and Purdue University (Exs. 6, 7, 8, 9 and

10) which was contracted by NIOSH to study OSHA's experimental variance. In addition, the substantial number of reasoned comments recommending permitting PSDI is a further basis for OSHA's conclusion that it should be allowed.

B. Specific Questions and Analysis for Safety of PSDI

The following section discusses comments addressing some specific issues on the general question of the safety of PSDI.

1. The major reason for the OSHA proposal to remove the prohibition against the use of PSDI is the history of its safe use in Europe for over 30 years. As an example expressed in a comment from Trans-Matic Manufacturing Company (Ex. 18–54):

> I would like to take this opportunity to support Presence Sensing Device Initiation (PSDI) of mechanical power presses. It is my firm belief that this technology, when properly administered, can be as safe or safer than the current hand methods for loading mechnical power presses
>
> Metal stampers in Europe have used this technology for sometime and have experienced high productivity with impressive safety records. The metal stamping industry in the United States is anxious to take advantage of the technology to make us more competitive on a global basis.

Another commenter, F.F.R. Associates (Ex. 18–33), stated:

> I wholeheartedly endorse the PSDI safety systems and have since I first inspected them in Europe many year ago and saw the safety records they produced.

A few of the comments were critical of the use of the experience wth PSDI in Europe as a base for its use in the United States. The National Machine Tool Builders (Ex. 18–70), stated:

> We do not deny that there has been some success in Europe by using PSDI, however we strongly object to the manner in which such comparisons have been used to support the reasons for accepting PSDI on a broad basis in U.S.

Another commenter, Peter N. Bosch (Ex. 18–25), noted that:

> In my direct experience and knowledge, other countries operate safely in large measure due to harsh penalties imposed on employers for unsafe conditions and not because of technological excellence.

OSHA agrees with the supportive comments that the safe use of PSDI in Europe is a testimony to the fact that the advanced technology available to other countries should also be available in the United States.

To the commenters who object to the use of the experience in Europe as proof of its success, OSHA is aware that there are differences in the procedures between the United States and the European countries to enforce the regulation of PSDI use. However, there are also many similarities. OSHA regulations are enforceable. This standard incorporates a certification requirement. Consequently, U.S. requirements have now become as effective, if not more effective than European requirements in this regard.

The variance provisions were based on Swedish requirements for safety and the provisions of paragraph (h) have incorporated these and other requirements to improve safety measures. In the comment from Interlake Stamping (Ex. 18–63), the following statement was made:

> The PSDI used at Interlake is, in my estimation, even better than the systems used in Germany and Sweden. I also feel that the effort in the new proposed regulation will certainly enhance and help keep PSDI systems a safe means of operating power presses.

OSHA believes that the PSDI system with the safety provisions of paragraph (h) will be more safe than the current regulation provides for.

2. The second major reason for the proposal was the safe experience of the variance at Interlake Stamping Corporation. In support of this reason was the comment from F.F.R. Associates (Ex. 18–33) who stated:

> After the no accident performance since 1976, and the Purdue University Study, I urge OSHA to certify PSDI as soon as possible to make it available to the entire industry.

Another supportive comment was received from Rockford Systems Incorporated (Ex. 18–38), which stated that:

> Representatives from our company participated in AMSA's June 4th seminar on PSDI. Information presented there regarding the use of PSDI in Sweden and Germany was very positive and encouraging as were the test results from the NIOSH/Purdue study. However, the most encouraging evidence that PSDI can be effective in a "real world" U.S. manufacturing plant was presented by Mr. Wayne Groenstein of the Interlake Stamping Company, Willoughby, Ohio. His situation seems by far the most tangible example that the system can provide both safety and increased productivity over an extended period of time.

One critical comment to the use of the variance as a valid base was that of Niagara Tool Works (Ex. 18–50), which stated:

> This proposed revision stems from the results of a variance granted to one member of the AMSA. How can any of us believe that such a limited application conducted under laboratory conditions proves anything either as to operator safety or productivity? This experiment was conducted under conditions not even faintly resembling those existing in the real world.

It is OSHA's opinion, after reviewing the studies done on the variance and conducting a number of OSHA staff visits to the Interlake Stamping Corporation to view the actual function of the PSDI system in action, that the environment was, in fact, sufficiently representative of anticipated workplace conditions to present a good indication of PSDI use. The excellent safety record still exists after 10 years at Interlake Stamping. OSHA believes this demonstrates an example of the ability for PSDI to increase safety.

The National Machine Tool Builders (Ex. 18–70) suggested that "Interlake Stamping Corporation be extended a permanent variance and that OSHA advertise again for additional companies who would like to apply for such a variance."

Based on the many comments received in favor of PSDI and its safety record, OSHA believes that a prolonged delay for PSDI is unnecessary. To require applications for variances would impose a time-consuming burden both to OSHA and the employer, which would further delay the availability of the improved safety capability presented by PSDI. In addition, 10 years of experience under the experimental variance is sufficient to test the safety of PSDI.

3. The third major reason for removing the prohibition on the use of PSDI was the conclusion of the Purdue University study of the Interlake Stamping Corporation experience.

As previously stated, the findings of this study recommended that "the prohibition be lifted against the use of safe-fail self-tripping light curtain devices" (Ex. 8). None of the comments received were critical of the Purdue study other than the previously mentioned comment (Ex. 18–50) regarding the limited number of presses used in the variance at Interlake Stamping Corporation.

It is OSHA's determination that the Purdue study of the Interlake Stamping Corporation variance is technically sound and provides good validation of the successful implementation of the experimental variance. It further supports OSHA's contention that PSDI may be accomplished safely.

4. The fourth reason for removing the PSDI prohibition is the safety advantage of less operator fatigue. In a report from Wayne Groenstein, President of Interlake Stamping Corporation, it is stated that in his experience with the Swedish government, they were "much concerned with ergonomics * * * which

relates roughly to what we call human engineering. For this reason they do not use restraints, which they consider a source of fatigue." The human factors of fatigue can cause errors in judgment and alertness which can result in accidents. Of the 10 operators that worked on the Interlake Stamping Corporation presses, all stated that they preferred the use of PSDI as opposed to two hand tripping restraint devices (Metal Stamping, May 1977).

As previously mentioned, the Torrington Company (Ex. 18–15) expressed the need for PSDI by stating "Over the past few years we have had various strain injuries including tendonitis caused by repetitive contact with palm buttons. One case was severe enough to cause the operator to be permanently removed from the job. This proposed rule would eliminate this type of injury."

There were no comments that dissented from the conclusion that PSDI reduces fatigue factor.

OSHA believes that reduction of fatigue is a positive safety benefit. Fatigue can cause errors in operator's judgment and alertness which can lead to accidents. In addition, reduction in operator fatigue is a benefit in itself for the health and welfare of the operator.

5. A fifth reason for revising the provisions of this standard is the provision of greater safety for those other than the operator who may be working in or around the area of the press. With the current method of manual control (unless supplemented by a light curtain as an auxiliary guard which is not required), only the hands of the operator are protected.

This opinion was reflected in a comment submitted by the Air Transport Association (Ex. 18–43) from Federal Express, which is one of its members that use mechanical power presses:

> We believe the Presence Sensing Device is a better method of guarding because it not only protects the operator but also anyone standing near the equipment.

The sensing device will immediately stop the downward stroke of the ram whenever anything or anyone interrupts the curtain of light, thus providing added protection for all employees who may be in the area in addition to the operator. Examples of this type of accident where a person who was not the operator was injured or the operator was injured because of the actions of a second person who actuated the manual controls were included in an attachment to a comment from the National Safety Council (Ex. 18–72). Three injuries were cited that involved more than one person in press operations while using two-hand control.

> Employee was not injured on own press. A second employee, operating a different press, was working on the same part but performing a different operation (double beading the part). The parts were being double beaded first and then going to the first employee for the expansion process. First employee ran out of parts to expand. Went over to the second employee and was reaching behind the machine to take out parts while the second employee was still running the press. Injury sustained: amputation, tip of right thumb.
>
> Press has a part revolution air clutch with two-hand controls on side of press and point of operation guarding. Cause of accident: Injured party was removing stamped parts from die and second party inadvertently inched press down causing amputation of part of left thumb. Press is equipped with automatic roll feed and two-hand control to actuate press.
>
> Adjusting mandril cylinder manually, operator energized air cylinder without notifying toolmaker. Toolmaker reached into die to clean off anvil, mandril came in pinched thumb and finger between mandril and anvil.

The use of PSDI could prevent these types of injuries by protecting the operator and others at the point of operation.

6. A sixth advantage of PSDI safety over the use of manual controls is that the operator will be less likely to disengage or by-pass the safeguarding methods, as is sometimes done to increase production when using manual controls.

The comment from Federal Express (Ex. 18–43) reinforced this statement by commenting that "If designed properly, the electrical devices cannot be over-ridden as in the case of two hand controls. Also, an adjustable field of coverage allows precise guarding of the hazard area."

The safety provisions of two hand or foot control can be over-ridden by purposely removing or manipulating other types of guarding to increase the operator's speed in feeding the material to the press and retrieving the product from the press. With PSDI this unsafe practice will be eliminated because any interruption of the presence sensing device will stop the movement of the ram, thereby safeguarding the point of operation.

C. Hands-in-Die Operations

On December 3, 1974 (39 FR 41844; [Ex. 14]), after extensive hearings, OSHA removed a prohibition on hands-in-die (HID) operations. In HID operation, the operator's hands may be placed at the point of operation as long as certain safeguards exist. In no-hands-in-die (NHID) operations, only hand tools or other devices are supposed to be at the point of operation, and not the operator's hands. The reasoning justifying the change was generally upheld by the Court of Appeals with a remand for a further supplemental statement of reasons on one issue, *AFL–CIO v. Brennan*, 530 F.2d 109 (3rd Cir. 1975). The further statement of reasons was published at 41 FR 40103 (September 17, 1976).

Prior to the proposal, a number of comments which OSHA had received, nominally on PSDI, were actually arguments that HID should be banned and only NHID operations should be permitted. OSHA did not reopen the issue of HID in the proposal on PSDI. The proposal (50 FR 12704–5; March 29, 1985 [Ex. 20]) did discuss the issue. It pointed out that 59 percent of point of operation accidents occur in NHID operations. Accidents occur because of fatigue, carelessness, and defeat of safeguards as well as hand location. Although the statistics are not definitive because data are not kept on the number of press cycles using HID and NHID operations, the statistics do not indicate that NHID is overall safer, as discussed in the proposal.

Although OSHA did not reopen the issue of HID compared to NHID in its proposal, a number of comments did address the issue. The Stamp Matic Corporation (Ex. 18–61) submitted a comment similar to OSHA's analysis which states:

> The OSHA studies and experimental variance have shown that when PSDI is properly used, the operator is as safe or safer when compared with currently permitted actuation means and safeguarding methods for HID operations.

Some other comments were principally directed toward the issues of HID and argued that it should not be allowed. From some press manufacturers, trade associations, and unions, OSHA has received opinions that are generally similar to this comment by the Niagara Machine and Tool Works (Ex. 18–50):

> Instead of sanctioning a system that encourages "hands in the die" we should all be working toward a system of keeping "hands out of the die" or as a minimum keeping them out as much as possible if not completely.

All the reasons and evidence given above for the safety of PSDI, are equally applicable for HID as for NHID. When the light curtain field is interrupted by a hand in HID or a tool in NHID, the ram will stop, thus eliminating the chance of injury at the point of operation.

For the reason discussed in the proposal preamble (50 FR 12704–5), OSHA continues to believe that its 1974 decision to permit HID operation was correct and that the available facts and data do not provide evidence indicating a need to reopen the issue. None of the comments which recommended disallowing HID operations submitted facts or data which would indicate the need to reconsider the issue, rather they were limited to expressing opinions.

The evidence of safety of PSDI was generated in HID operations. The presses used in the Interlake variance were operated in the HID mode. There were no accidents. The Purdue Research Foundation and the Hauge studies of PSDI operation were of it used in the HID mode and their recommendations of its safety were based on using it in HID modes. The European evidence of safe use of PSDI is based principally on using it in the HID mode. The additional safety benefits of PSDI through reduction in fatigue and protection of other persons in addition to the operators applies equally to HID and NHID operations.

The new provisions for the safety of the entire system, which are provided in paragraph (h) and new appendices of the final rule, are applicable of course both to HID and NHID operations, and are intended to assure that the use of PSDI will be done safely with a very high degree of reliability. No factual or statistical evidence has been presented that PSDI will not present the same degree of safety for HID as for NHID. Indeed, no comments have been presented on this specific point rather than on the broader point of the relative merits of HID and NHID. Based on all the evidence just discussed, OSHA concludes that PSDI is appropriate for HID and NHID operations.

D. Range of Interests Reflected in Comments

The comments that were received on the proposed rule represented the broad range of interests that are involved with mechanical power presses.

Included in this group were 3 insurance companies, 32 press users, 6 trade associations, 2 labor organizations, 15 press manufacturers, 20 presence sensing device manufacturers, 5 safety consultants and 4 government agencies. The largest group of the responses were from those who will use PSDI on their presses.

Within these groups, the breakdown of those for and against the revision for PSDI was as follows:

	For	Against
Press Users	32	0
Device Manufacturers	20	0
Press Manufacturers	11	4
Trade Associations	3	3
Consultants	3	2
Government Agencies	4	0
Insurance Companies	2	1
Unions	0	2
Other	2	0

In the comments from those who will use PSDI on their presses, the general opinion was that it is a necessary step forward that will not only enhance safety but will increase productivity and international competitiveness as well. OSHA's decision to approve PSDI was based on evidence of its safety.

The comments from the presence sensing device manufacturers were similar to the ones from those who will use PSDI. They requested prompt action and suggested as few changes in the language for clarification and feasibility in the requirements. Where those suggestions assisted in clarifying or improving the feasibility of the rule without reducing safety, OSHA has incorporated them in the final standard.

The comments from press manufacturers generally favored the proposal, but many had concerns about the product liability they would have as designers and builders who would have no assurance that the press would be used in a manner that would meet the requirements of the standard. OSHA has no statutory authority on matters of workers' compensation or liability. In addition, section 4(b)(4) of the Occupational Safety and Health Act states:

> Nothing in this Act shall be construed to supersede or in any manner affect any workmen's compensation law or to enlarge or diminish or affect in any other manner the common law or statutory rights, duties, or liabilities of employers and employees under any law with respect to injuries, diseases, or death of employees arising out of, or in the course of, employment.

However, OSHA believes the specific requirements of the PSDI standard will lead to safer operation and more reliable operation of safety systems. OSHA of course has authority to enforce these requirements. The resulting improvement in safety may reduce liability concerns through fewer accidents.

Several other comments, including insurance companies, government agencies, consultants, and a safety council, also generally endorsed the regulation for PSDI, with some qualifications. Many stressed the importance of certification to assure the reliability of the entire system.

The labor union comments were opposed to PSDI based on their policy of NHID and their belief that such a program cannot feasibly be implemented in a normal industrial setting. OSHA has evaluated these comments as well as other comments received, and believes that the previously mentioned facts and analyses are evidence that PSDI can be used safely.

Among the other comments received were requests for minor changes in the language used for the purpose of clarification and enforceability of the requirements. Other requests were to delete paragraphs that are covered in other standards or were too restrictive.

OSHA has carefully considered at of the comments that were received and appreciates the interest and concerns of all of the respondents. Where changes were suggested that would not adversely affect the health and safety of the employee, and had a reasonable basis, revisions to the proposed rule generally were incorporated.

The public comments on the proposal frequently suggested specific technical considerations for enhancing the safety of PSDI. OSHA has attempted to incorporate these suggestions by including a number of technical provisions in the standard. OSHA believes the specificity of the provisions is appropriate for the highly technical nature of PSDI operation, and is necessary—in conjunction with the certification requirement—to assure worker safety.

III. Summary and Explanation of the Final Rule

The following section discusses the individual requirements of the standard permitting presence sensing device initiation of mechanical power presses. It includes an analysis of the comments and record evidence on those specific requirements and changes made in response to the comments. The language of the standard essentially follows that of the proposal except for revisions based on OSHA's review of the entire rulemaking record, including the written comments and data submitted during the comment period.

There were some provisions that received no comments. Where there has been no change from the proposed rule, these provisions have been referenced to the specific page in the Notice of Proposed Rulemaking of March 29, 1985 (50 FR 12700) where a discussion of the provision can be found and, in general, the discussion has not been repeated in this final preamble.

A. Definitions

Section 1910.211(d)(11), "Device," was proposed for revision to make it more appropriate for PSDI by detecting any part of an operator's body or by detecting any other objects such as hand tools. Guardimark International and the Motor Vehicle Manufacturers Association (MVMA) (Exs. 18–1 and ×45) pointed out that the revision is limiting and would not be pertinent to all devices. MVMA (Ex. 18–45) suggested retaining the language presently in § 1910.211(d)(11)(ii) and adding the proposed definition in a new subparagraph (iv). OSHA has adopted this suggestion in the wording of the final rule.

Section 1910.211(d)(12), "Presence sensing device," was proposed for revision to better define the control of the press and to include activation by other objects such as hand tools. Two commenters (Exs. 18–1 and –45) raised objections to the term "any other object." The point was made that the phrase could be misconstrued to mean an employer could not have a semiautomatic system using a contact switch to sense the presence of a part. Accordingly, the provision is revised in the final rule to substitute "a hand tool" for "any other object."

Section 1910.211(d)(61), "Presence sensing device initiation." A discussion of this term can be found in the proposal at 50 FR 12707. There were no comments received on the definition.

Section 1910.211(d)(62), "Safety system," was proposed as a new concept for a functionally complete, certifiable, total system for PSDI. The definition enlarges upon the control reliability concept in the current standard, for applicability to the PSDI mode of operation, such that a single failure or single human error will not cause injury due to point of operation hazards. The general concept was not criticized. However, several commenters, including the American Metal Stamping Association (AMSA) (Exs. 18–38, –39, –40, –45, and –64) expressed concern regarding the overly broad term "human error," suggesting instead that the error be related to operation of the press. OSHA agrees that it is the intention of the definition to address operating errors, and the definition is so revised in the final rule.

Section 1910.211(d)(63), "Authorized person." This new definition was proposed to clarify the term "authorized person" as one to whom the authority and responsibility to perform a specific assignment has been given by the employer. No substantive comments were made on this definition, and it is included in the final rule without revision.

Section 1910.211(d)(64), "Certification" or "certify." This new definition is added to clarify the distinction, for PSDI safety systems, between the certification of the safety systems by manufacturers, employers, or their representatives, and the validation (by an OSHA-recognized third-party validation organization) of the certification.

Section 1910.211(d)(65), "Validation" or "validate." This new definition is added to clarify the distinction, for PSDI safety systems, between the validation (by the OSHA-recognized third-party validation organization) of the certifications of the safety systems by manufacturers, employers, or their representatives, and the certification itself.

Section 1910.211(d)(66), "Certification/validation" or "certify/validate." This new definition means the combined process of certification and validation.

B. Revisions

Section 1910.217(c)(3)(iii)(b). This revision was proposed to modify the current prohibition on slide motion initiation to permit PSDI if it is used in total conformance with the proposed new paragraph (h) of this section. No comments were received, and it is included in the final rule as proposed.

Section 1910.217(h)(1), "General." In paragraph (h) of § 1910.217, OSHA states the additional requirements which must be fulfilled in order to use PSDI on a mechanical power press which is in conformance with the other applicable requirements of § 1910.217. In addition, to increase convenience, some of the paragraphs of the current standard (those which OSHA believes will be most helpful) which specifically are applicable for PSDI are referenced in appropriate portions of § 1910.217(h). OSHA believes this will facilitate the understanding of the requirements for PSDI, and will aid in identification of the total system concept required for PSDI use. While such references are intended to enhance emphasis, convenience and understanding in relating the new provisions to the existing standard, it should be noted that other portions of the existing standard continue to be applicable, and it is not OSHA's intent to exclude the applicability of those other provisions.

Paragraph (h)(1)(ii) states that the paragraph (h) requirements apply in addition to other portions of § 1910.217.

Not all requirements of paragraphs (a) through (g) of § 1910.217 apply to all mechanical power presses. Some of the requirements are general, but others are directed at specific types (full or part revolution) of mechanical power presses and some requirements are directed at specific operator controls and guarding methods for a particular type of press. For example, paragraph (c)(5) is clearly invoked for presence sensing device initiation modes that use hands-in-die feeding, because the presence sensing device is the guarding method on such operations. It would not be invoked by presence sensing initiation if parts are fed manually with tools. Since the intent of the new provision is to supplement the requirements of paragraphs (a) through (g), paragraph (h)(1)(ii) includes the relevant requirements of § 1910.217 (a) through (g) for all presses used in the PSDI mode of operation.

In § 1910.217(h)(1)(iii), OSHA continues the prohibition on PSDI on full revolution mechanical power presses. OSHA believes that full revolution presses are not suitable for PSDI use. By definition, a full revolution clutch, when tripped, cannot be disengaged until the crankshaft has completed a full revolution and the press slide has completed a full stroke. The capability of a press to be stopped at any point in the down stroke of the slide is considered essential for the safe operation of a press in the PSDI mode.

The American Metal Stamping Association and others (Exs. 18–25, –39 and –64) expressed concern regarding the language proposed in (h)(1)(iv) which prohibits the PSDI mode of operation for presses with a configuration which enables a person to insert his or her body completely into the bed area. The intention of the provision is that some part of an operator's body must remain in the presence sensing device field or be protected by supplemental safeguarding when any part of the same person's body is in the point of operation. This is necessary for safety so that PSDI would not be defeated. If an operator can totally pass through the presence sensing device field into the bed or bolster area of the press, any accidental intrusion into the field could cause the press to trip while the operator is exposed. This hazard potential is described in the comments by Link Systems (Ex. 4–45) on the preproposal draft standard which OSHA circulated for public comment in June 1983.

The commenters to the proposal agreed to the overall necessity of the provision but suggested more specific wording in order to clarify the intent that some part of the operator's body remain in the sensing field. The provision is so revised in the final rule.

One commenter (Ex. 18–64) suggested that it should be made clear that the provision does not apply to die-setting or maintenance procedures where other appropriate safeguards are in use. OSHA agrees that the wording should be clarified, and the final rule is therefore revised accordingly. With regard to the exception for die-setting and maintenance, die-setting is excluded from being done in the PSDI mode by paragraph (h)(6)(xv) of the proposal. However, to prevent possible confusion, an additional provision, (h)(1)(v), is contained in the final rule to emphasize that the PSDI mode only applies for normal production operations.

Section 1910.217(h)(2), "Brake and clutch requirements." There are a number of factors which indicate the need for more stringent provisions for brake and clutch systems in the PSDI mode. Among these are the greater operator speed and smaller margin for operator error. For these reasons, the standard includes limits on types of brakes, a requirement for demonstrating high torque capability, and a requirement for assuring non-interleaving of brake springs.

In § 1910.217(h)(2)(i), OSHA prohibits flexible steel band brakes and mechanical linkage actuated brakes or clutches on presses used in the PSDI mode. OSHA believes that fast and consistent stopping are critical to safety in the PSDI mode. The prohibited types of brakes and clutches have been shown by experience not to possess a long-term reliability against structural failure, as compared to other types, and therefore, are not considered acceptable. This provision was not criticized and is retained in the final rule.

Several commenters (Exs. 18–26, –39, –57, –60, –64 and –76) addressed the provisions in (h)(2)(ii) which would require high torque capability for press brakes so that the ram will stop quickly if the operator's hand reentered the light curtain. OSHA believes such a capability is necessary for PSDI because of the greater operator speed and the smaller margin for operator error. One commenter (Ex. 18–64) views the requirement as a "benchmark" by which an employer could check an existing press to determine whether or not it is potentially suitable for PSDI operation. That commenter, however, as well as others, expressed reservations regarding certain aspects of the provisions, as follows.

The definition of "full stop" which is cited in Appendix A for the determination of the stopping times measurements was discussed by several commenters (Exs. 18–15, –24, –25, –64 and –76). It was generally recommended that full stop be defined by crankshaft rotation, rather than by deceleration of the slide as OSHA proposed, with one or two revolutions per minute most often suggested as the full stop. OSHA accepts this recommendation because it will be more practical and will better define and aid in monitoring the measurement of stopping time, and Appendix A is so revised in the final rule.

Sick-Optick-Electronik, Incorporated (Exs. 18–57, –58 and –79) suggested that the brake torque tests be conducted at full speed if there is a speed selection. OSHA concurs that the measurement should reflect maximum speed conditions, and the final rule includes this requirement.

ELKAY Manufacturing Company (Ex. 18–39) suggested that in paragraph (h)(2)(ii) the *longest* stopping time be used, rather than the *average* stopping time. This commenter was concerned about the possibility of injury under an emergency stop condition, and pointed out that stopping times at other than 125 percent of the time at the top crankshaft position would not represent the worst stopping conditions. OSHA agrees that there may be considerable variation in stopping time depending on crankshaft position. However, the purpose of the tests defined in paragraph (h)(2)(ii) is to ensure that the brake systems on presses used in the PSDI mode be of a high torque design for fast and consistent stopping time capability. The specific stopping time elements used in calculating safety distance as defined in a different provision, paragraph (h)(9)(v), are the longest of averages, with additional built-in safety factors. No additional changes were made in the final rule, therefore, because OSHA believes the safety factors already built in are sufficient for the purpose of the provision.

In § 1910.217(h)(2)(iii), OSHA prohibits brake springs of interleaving design. In the event of a break in a spring, OSHA believes this and other provisions of the paragraph will reduce the possibility of significantly increasing the stopping time beyond the normal brake stopping capability. There were no objections to this provision.

Section 1910.217(h)(3), "Pneumatic systems." OSHA considers fast and consistent stopping capability to be critical to PSDI safety. Variations in stopping time may be caused by such factors as air value failure, and mechanical variations due to air cleanliness, pressure, moisture, and lubrication. Section 1910.217(h)(3) addresses such pneumatic system failures and other conditions which could affect the stopping time of a press in the PSDI mode. It also highlights some of the provisions of the current standard which are applicable to pneumatic systems in PSDI operations. Finally, it prescribes the correct adjustment of air counterbalance systems for the die weight used in order to maintain the stopping time. There were several comments on technical matters, but the overall objectives were not criticized.

The American Metal Stamping Association (Ex. 18–64) pointed out that paragraph (h)(3)(ii)(B) was not clearly written, and suggested shortening the provision to clarify it. OSHA agrees that the intent of the provision is to ensure the correct counterbalancing of the slide attachment (upper die) weight, and the wording is so revised in the final rule.

The ELKAY Manufacturing Company and Data Instruments (Exs. 18–39 and 40) commented on the correlation between adjustment of the pneumatic systems and the stopping time measurements. In order to clarify the intent of the provisions and ensure accurate time measurements, the final rule includes a requirement that the counterbalance adjustments be made before performing the stopping time measurements required in paragraphs (h)(2)(ii), (h)(5)(iii), and (h)(9)(v).

Section 1910.217(h)(4), "Flywheels and bearings." This provision is intended to prevent unintended and uncontrolled press strokes caused by bearing seizure. One commenter (Ex. 18–12) included this provision in a list of several provisions in the proposed standard with the recommendation that, if they are imposed on PSDI operations, they should also apply to other methods of press cycle initiation. The list also included paragraphs (h)(2) (i) and (iii), (h)(3), (h)(5), (h)(6) (i), (ix), (xiii) and (xv), (h)(7), (h)(8)(i), and (h)(10). The commenter stated that the proposed regulations for PSDI impose limitations which are not imposed on operating modes which are less safe, and that these might militate against the adoption of PSDI in some applications, with a resulting loss in the potential for improved safety and efficiency.

PSDI requires enhanced reliability of systems because back-up safeguards are not used. The additional provisions are designed to give the necessary enhanced reliability and are therefore necessary for PSDI operation. It was not an issue in the rulemaking whether such provisions would enhance non-PSDI operations. This was generally the only comment received to this issue and the issue has not been studied in depth. Therefore, it is not possible to state

whether the referenced provision would improve non-PSDI operations.

Section 1910.217(h)(5), "Brake monitoring." OSHA considers fast and consistent stopping capability to be critical to PSDI safety. The provisions on brake monitoring are intended to ensure that increases in press stopping time over a period of use do not exceed the time used to develop the safety distance established for the press set-up. A detailed discussion of the technical provisions is included in the proposal at 50 FR 12708. The aims of the provision were not objected to.

Some comments, including two from the State of Maryland, Division of Labor and Industry (Exs. 18–19, –22, –39 and –66), were received regarding paragraph (h)(5)(ii). One commenter (Ex. 18–66) suggested that the provision be revised to require that the adjustment of the brake monitor not be done without the supervision of an authorized person, and to delete the requirement for prior approval by the third-party certification program. Two commenters from the State of Maryland (Exs. 18–19 and –22) questioned an apparent conflict between this provision and (h)(12)(iii) which requires, following a die change, that the safety distance be checked and maintained by authorized persons with certain qualifications. These commenters asked why prior approval by the third-party certification program is required in (h)(5)(ii) but not in (h)(12)(iii). The ELKAY Manufacturing Company (Ex. 18–39) suggests that the brake monitor unit be sealed with a seal that would have to be broken in order to adjust it to aid in policing the requirement.

OSHA agrees with the suggestion that (h)(5)(ii) be extended to require that brake monitor adjustment be done under the supervision of an authorized person. Such a provision would strengthen the requirement. The provision is so revised in the final rule.

OSHA believes, however, that the adjustment of the brake monitor has the potential of such impact on the safety distance that prior approval of the validation organization (previously called "certification program" in the proposal) is essential. The degree of importance is based on the fact that the calculation of the impact of the brake monitor adjustment on the safety distance is extremely critical and complex, but is much less frequent than checking the safety distance after a die change. The minimum safety distance for a press with a certified/validated safety is required by paragraph (h)(11)(vi) to be indicated on a label affixed to the press, and the process of checking and maintaining the safety distance would not require review by the validation organization. The validating organization must decide in what circumstances general advance approval can be given and in which circumstances specific authorization is needed.

Sealing of the brake monitor unit to prevent unauthorized adjustment would seem to be an unnecessary burden on the employer. OSHA has not adopted this suggestion.

A large number of commenters (Exs. 18–2, –15, –17, –24, –26, –37, –40 –52, –58, –63, –64, –71, –77, –79, –80 and –83) representing 10 users, five device manufacturer, and one press manufacturer, expressed concern regarding the provision in paragraph (h)(5)(iii) that the brake monitor setting allow no more than a 10 percent increase in the longest stopping time for the press. It was the general concern of the commenters that the 10 percent limit would result in too limited a range of operation for fast stopping brakes (i.e., only five milliseconds for 50 millisecond brakes) and would, in fact, penalize the faster stopping machines. It was suggested that the provision be revised to call for a maximum of 10 milliseconds or 10 percent, whichever is longer, as the allowable variation. OSHA agrees, for those reasons, and the final rule is revised accordingly.

Section 1910.217(h)(6), "Cycle control and control systems." The PSDI reliance upon the control system to initiate safe press operation places a particular burden on the controls to function properly and to be arranged in a manner to be understood and properly used by the operator. The provisions on cycle control and the control system are intended to ensure that the controls will enable safe operation in the PSDI mode. The technical details and explanation of the specific reasons for the various provisions are discussed at length in the proposal at 50 FR 12709. There were a large number of public comments on these several provisions. The provisions not discussed below were generally not criticized by commenters.

Paragraph (h)(6)(ii) in the proposal called for dynamically monitoring the crankshaft rotary position indicating device in order to prevent successive strokes if the device were to become decoupled. The provision was mentioned in several comments by press users or their representatives and the ANSI Bill Committee (Exs. 18–37, –39, –40, –51 and –64). Some of the commenters (Exs. 18–37, –40 and –64) suggested that the word "dynamically" be deleted. The reasons stated were that it is misleading, could be confusing, and implies immediate sensing of the lack of motion. One commenter (Ex. 18–39), however, reported on an experience with a broken crankshaft which was not detected. The word "dynamically" was used by OSHA in the wording of the provision in order to prevent the use of a static switch-type monitor which could be subject to an undetected failure. Dynamic monitoring entails use of a motion sensor, such as an inductive sensor or a photoelectric sensor that senses gaps or teeth in a wheel or gear that is directly coupled to the rotary position indicator. This type of motion sensing cycles with each cycle of the press, with the result that the sensing of the lack of motion is immediate, and the press will be stopped immediately. In veiw of the need to immediately sense any lack of motion, the word "dynamically" is being retained in the final rule.

Mr. Robert D. Jordan (Ex. 18–51), a consultant, questioned the use of the word "device" in the term "rotary position indicating device," pointing out that the use is inconsistent with definitions in § 1910.211. OSHA agrees, and in the final rule, the word "mechanism" is used in place of the word "device" in the provision.

Paragraph (h)(6)(vi) called for a timer to deactivate the PSDI mode when the press does not stroke within a period of time set by the timer. The purpose is to prevent the operator from inadvertently operating the press in the PSDI mode, after being distracted or leaving the work station, by making the operator reset the press after a longer than normal gap in time for insertion of stock.

The provision in the proposal set a limit of 15 seconds for a manually adjustable timer, with a special tool for the adjustments. This requirement was mentioned by a number of commenters (Exs. 18–19, –22, –37, –40, –44, –52, –56, –58, –64, –77, –78, –79, –80 and –83). It was the general opinion that if the setting for the manually adjustable timer is limited to a maximum of 15 seconds, there should be no need for a special tool because it is unlikely that the operator could change or forget the operating mode in such a short interval. Sick-Optik-Electronik (Exs. 18–56 and –78) noted that a longer time, up to 30 seconds, is used in other countries. The ELKAY Manufacturing Company (Ex. 18–39) stated that the 15-second time limit is impractical on larger, higher tonnage, slower presses where many operations may be required before loading the press, and suggested that the limit be made more flexible in order to avoid preventing PSDI use on many presses. OSHA agree with the comments and the provision is revised in the final

rule to permit greater flexibility in the maximum time setting, where required by the nature of the operation, and to delete the need for a special tool for short time interval settings of the timer.

The State of Maryland, Division of Labor and Industry (Exs. 18–19 and –22), suggested that an indicator be required in paragraphs (h)(6)(vi) and (h)(6)(xi) which will present the number of intrusions that have been programmed for tripping, and the number of insertions that have been made toward tripping the press. OSHA believes that the need and utility of such an indicator would not be such as to warrant its inclusion as a mandatory element of the control system.

Paragraph (h)(6)(xi) requires that, where there is more than one operator of a press in the PSDI mode, each operator must be protected by a separate, independently functioning presence sensing device. The ELKAY Manufacturing Company (Ex. 18–39) stated that the requirement is acceptable if multiple operators are positioned so that only one operator is on any one side of a press, but that where there is more than one operator on one side of a press, a single presence sensing device would be usable. OSHA believes having more than one operator protected by a single presence sensing device could be hazardous because of the need for exceptional coordination between the operators, and the provisions, therefore, is unchanged in the final rule.

Paragraph (h)(6)(xii) in the proposal required that when a press is equipped for PSDI operation, the presence sensing devices must provide effective safeguarding in all other production modes as well as PSDI. The purpose of this provision was to enhance the reliability of the presence sensing device by ensuring that it remains operable. Several commenters, including a consultant, metal stampers and device manufacturers (Exs. 18–25, –37, –56, –57, –78, –79 and –83), objected to this requirement. It was pointed out that, although the requirement is well-intended, there are other modes of operation, such as two hand control, which are safe and meet the current standard without the use of an additional presence sensing device as a safeguard. By allowing the alternative mode, the press can be utilized safely in the event a presence sensing device is removed for servicing. If the device were required for the other mode, there would be an incentive for jumpering or bypassing the device, which could create a potential hazard if it is not done properly or is not later removed. OSHA agrees with the commenters. If the final rule, the provision is deleted from the standard and is included as an advisory suggestion for consideration in Appendix D.

Paragraph (h)(6)(xiii) requires that the control system incorporate interlocks for supplemental guards, if used, which will prevent stroke initiation or stop a stroke in process if any supplemental guard fails or is deactivated. The purpose of the requirement is to ensure that no part of an operator's body is in the point of operation during a stroke if a supplemental guard is not in operation. Supplemental safeguards are required by the standard in order to protect all areas of access to the point of operation which are unprotected by the PSDI presence sensing devices. Two comments (Exs. 18–45 and –64) were received on this provision. The Motor Vehicle Manufacturers Association saw no need for the interlock and believed it would not materially enhance the safe operation of presses. The American Metal Stamping Association supported the requirement, and suggested a method of interlocking which requires no extra microswitches or interlocking sensors. This method has been used successfully at the Interlake Stamping Corporation in connection with the experimental variance. OSHA believes it is essential for the safety of the operator that any deactivation of a necessary supplemental safeguard prevent a subsequent stroke initiation or stop a stroke in progress. Otherwise, an operator could inadvertently cause stroke initation while exposed at the point of operation. With PSDI, if there were no interlock of supplemental safeguards, the safeguards could be removed and a second employee could get his or her hand into the point of operation while the operator activated the press. The interlock, of course, prevents this. The provision is continued in the final rule as proposed. In addition, the method suggested by the commenter is described in Appendix D to the final rule as an acceptable method of complying with the requirement. Other methods of preventing stroke initiation that are as effective are also permitted.

Paragraph (h)(6)(xiv) addresses requirements for automatic self-checking of the control system at least once each cycle and before the initial PSDI stroke. The intent of this provision is to ensure proper functioning of the control system for each PSDI cycle. A number of commenters, representing the metal stamping industry and presence sensing device manufacturers (Exs. 18–39, –40, –56, –57, –58, –64, –66, –78, –80 and –83), expressed concern that the wording is unclear and could be construed to include all switches and contacts. It was suggested that the requirement be revised to call for checks for correct status of control elements after power-on and before the initial PSDI stroke, and for operation of all cycling control logic element switches and contacts at least one each cycle. OSHA agrees, and the provision is so revised in the final rule.

Paragraph (h)(6)(xv) contains provisions for an "inch" operating means meeting the requirements of paragraph (b)(7)(iv) of this section, and prohibits die-setting in the PSDI mode. Consultant Peter N. Bosch (Ex. 18–25) correctly noted that the sensing device would be by-passed in the "inch" mode, and expressed an observation that press owners are increasingly using the "inch" mode as a production mode in the erroneous belief that it is the safest operator control means. He pointed out the need to reinforce prohibiting production in the "inch" mode. OSHA agrees the "inch" mode is not designed for production (see § 1910.211(39)). Specifically, the safeguards are disconnected and an employee could have his or her hand at the point of operation. Should the inch mode be activated, the ram of the press would move downward, even though at slow speed, and cause harm. The final rule has been revised from the proposal to include such a prohibition in this paragraph, as well as to include discussion and guidance on the subject in Appendix D.

Paragraph (h)(6)(xvii) of the proposal required that controls with internally stored programs meet the control reliability requirements of the standard, and default to a predetermined safe condition in the event of any failure within the system. The proposal also prohibited the use of programmable controllers. The intent of the paragraph is to permit controls with internally stored programs which will fail safe, but to prohibit programmable controllers in order to prevent their manipulation to an unsafe condition.

There were a number of comments on this paragraph (Exs. 18–2, –12, –16, –18, –25, –32, –39, –40, –42, –64, –66, –73 and –81). A consultant for Travelers Insurance Company (Ex. 18–16) pointed out that the term "internally stored program" could be misunderstood to apply only to electronic type controls since the term is colloquially applied to solid state equipment. On the correct assumption that the paragraph is intended to apply to all types of controls—including mechanically operated rotary cam switches—the

commenter suggested adding wording to include mechanical, electro-mechanical or electronic types of controls. OSHA agrees that the clarification is useful and has made the recommended changes.

Data Instruments and AMSA (Exs. 18–40 and –64) suggested the provision be modified to use the term "single failure" rather than "failure," in order to be consistent with other control reliability requirements. The Wiremold Company (Ex. 18–32) agreed with the prohibition to prohibit programmable controllers because of the unpredictable failure of input/output modules, and the inability to inspect them. Nearly all of the other commenters, however, objected to the prohibition against *all* programmable controllers. It was pointed out that programmable controllers increasingly are being supplied with new presses and are safely arranged by "burning-in" the logic to control those safety parameters which the press user does not want to be tampered with, while permitting the adjustment of other control items not related to safety. Such systems are said to meet the control reliability requirements of the standard, and are considered less user-accessible than relays or some other types of solid state controls. It was suggested that the paragraph be revised to permit the use of programmable controllers provided that all elements affecting the safety system and point of operation safety are internally stored and protected in such a manner that they cannot be altered or manipulated by the user to an unsafe condition. OSHA agrees with these suggestions for the reasons stated, and the paragraph is revised in the final rule in order to incorporate them.

Section 1910.217(h)(7), "Environmental requirements." This paragraph addresses, in performance language, the operational and environmental stresses (such as temperature, vibration, humidity, etc.) which could impair the capability of the control system to perform as intended. Since PSDI places great reliance on the control system for safe press operation, it is necessary that the control system not be deleteriously affected by such stresses. Two comments were received on this paragraph. As mentioned in the discussion on paragraph (h)(4), Alcona Associates (Ex. 18–12) included this provision in a list of several provisions in the standard, with the recommendation that they also apply to other methods of press cycle initiation. As stated in the earlier discussion, this rulemaking can only address PSDI requirements, but OSHA shall continue to monitor the efficacy of the § 1910.217 requirements. The Motor Vehicle Manufacturers Association (Ex. 18–45) suggested that the paragraph be deleted because it presents a burden on the employer to anticipate the unknown. OSHA believes the requirement is essential for the safe accomplishment of PSDI. The stresses involved are not totally unknown; Appendix A outlines the major likely stresses. The burden is principally placed on the manufacturer, not the employer, to design the PSDI safety system to meet the stresses likely on the shop floor, such as heat and vibration. This type of consideration is present in the design of most machines. It is not an unusual requirement nor a requirement to anticipate the unknown, but the likely or possible. Therefore, the paragraph in the final rule is unchanged from the proposal.

Section 1910.217(h)(8), "Safety system." This paragraph expands upon the control reliability requirements of the existing standard to assure safety both when the PSDI safety system is working properly and when there is a malfunction. Specifically, a single malfunction, either by the operator or the PSDI safety system, is not to permit a point-of-operation accident. It also requires, through the certification/validation provisions, that the manufacturer and the employer will design and operate the PSDI safety system as an integrated group of components designed to operate together compatibly. The required safety system includes all elements which operate together to prevent the worker from receiving injury at the point of operation. Supplementary safeguards, if required, are considered a component of the safety system. *The safety system concept emphasizes the fact that PSDI shall not be attempted merely by the addition of a presence sensing device to an existing press.*

The paragraph in the proposal included a provision that a single failure or single human error shall not cause injury to personnel from point of operation hazards. Nearly all of the comments received on this paragraph were from press users and device manufacturers (Exs. 18–18, –32, –40, –44, –52, –56, –58, –64, –77, –78, –79, –80 and –83) and contained objections to the term "human error." It was pointed out the term is too broad, as it might be construed to include human error in any facet of PSDI implementation. OSHA agrees. The intent of the provision is to address operating errors. The provision is so revised in the final rule. Otherwise, there were not substantial objections to the provision.

Section 1910.217(h)(9), "Safeguarding the point of operation." This portion of the standard contains a number of provisions intended to safeguard the point of operation.

Paragraph (h)(9)(i) cross references the applicability of the requirements in the current standards relating to safeguarding the point of operation.

Paragraph (h)(9)(ii)(A) states that implementation of PSDI shall be with the light curtain (photo-electric) type. The only current presence sensing devices suitable for stroke initiation are the light curtain type. However, to allow for advancements in technology (h)(9)(ii)(B) provides the procedure for obtaining approval for alternatives to light curtains if they are demonstrated to be as safe and reliable.

The ELKAY Manufacturing Company (Ex. 18–39) suggested additional wording to require that the device cannot be sensitive to ambient light or other external light source or signal. The apparent intention of the suggestion is to prevent inadvertent sensing of any external light or signal sources by the device. This is recognized as a basic design requirement for any functionally effective presence sensing device. The suggested change is not considered necessary in the paragraph.

Guardimark International, Inc. (Ex. 18–66) suggested additional wording to avoid implication that supplemental safeguarding is limited to light curtain devices. Since paragraphs (h)(9)(viii) clearly permits the use of other types of guards—which meet the requirements of paragraphs (c) and (h) of this section—to be used as supplemental safeguards, the suggested change is not considered necessary in (h)(9)(ii).

Paragraph (h)(9)(iii) limits the individual sensing field of a presence sensing device used to initiate strokes in the PSDI mode to cover only one side of a press. Three comments from device manufacturers (Ex. 18–11, –56 and –78) objected to the limitation. It was stated that if the light curtain systems are independent and mutually exclusive, there would be no erroneous signals, and that single light curtains have been used safely for PSDI on multiple side installation. OSHA believes that the use of mirrors or other techniques to "bend" the field of a light curtain reduces the reliability of the device for stroke initiation. The paragraph (h)(6)(xi) requirement for a separate device and control for each operator of a press dictates that no more than one side of a press be covered with any one sensing field. No change is made in this paragraph in the final rule.

Paragraph (h)(9)(iv) in the proposal called for a minimum object sensitivity of one and one-fourth inches (31.75 mm)

for light curtains used for PSDI operation, and limited blanking to one blanked area with a maximum size of two inches (50.8 mm). "Object sensitivity" describes the capability of a presence sensing device to detect an object in the sensing field. The intention of the paragraph was to ensure fast and reliable detection of parts of the body and hand tools entering the light curtain as well as reliable and consistent stroke initiation.

ELKAY Manufacturing Company (Ex. 18–39) stated the opinion that the one and one-fourth inch (31.75 mm) minimum is needed because if it were larger, persons with small arms and hands could penetrate the presence sensing field so as to prevent or delay the detection of their hands. Two commenters (Exs. 18–65 and –75) suggested that the one and one-fourth inch (31.75 mm) minimum could be increased because the average thickness of the back of the hand is greater. One of these commenters suggested one and three-fourths inches (44.45 mm) as minimum.

OSHA believes the one and one-fourth inch (31.75 mm) minimum is necessary to prevent small hands from penetration too close to the press before the device senses the intrusion and prevents the ram from operating or stops it. Retaining this minimum will also enhance safety by lowering the penetration depth factor—from about five inches (127.0 mm) for one and three-fourths inches (44.45 mm) to about 3.3 inches (83.8 mm) for one and one-fourth inches (31.75 mm)—which would affect the safety distance calculations called for by paragraph (h)(9)(v). Consequently, no change is made in this provision in the final rule.

A number of commenters (Exs. 18–6, –19, –22, –37, –39, –40 and –60) objected to the provision for blanking. "Blanking" is a form of blocking of the sensing device pattern to allow the feeding of stock or parts. It removes a portion of the sensing field from operation, creating a blind spot which does not sense the presence of any object or any part of the operator's body. Many commenters suggested not only that the two inch (50.8 mm) size is unsafe, but that blanking should not be permitted because in combination with minimum object sensitivity, it could result in too great a gap in the sensing field. OSHA agrees that the provision for blanking is potentially unsafe for the reason stated, and the final rule is revised from the proposal to prohibit blanking.

Paragraph (h)(9)(v) in the proposal sets forth the formula for calculating the required safety distance—the distance from the sensing field to the point of operation. The purpose of the safety distance is to prevent the operator's hand from being caught in the point of operation if the hand reenters the space between the light curtain and the point of operation after the stroke has been initiated. The safety distance allows sufficient time for the ram of the press to be stopped before the hand reaches the point of operation. It does this making sure that the time from when the presence sensing device senses that the hand has reentered the light curtain field, until the brake stops the ram is less than the time it will take the hand to move from the sensing device field to the point of operation.

The current regulation utilizes a formula based on a hand speed of 63 inches per second (1.6 m/s) and the total press stopping time. In the proposal, OSHA increased the safety distance for any given press by changing the safety distance formulas in two manners.

First, the hand speed was increased from 63 in/sec to 100 in/sec. (The faster the assumed hand speed, the longer the necessary safety distance, because the hand is assumed to travel further in a given stopping time of the press ram.) OSHA questioned whether there was a greater possibility with PSDI than with dual palm buttons initiation that a hand could reenter the sensing field moving rapidly and consequently overall faster hand speed would result. In addition, OSHA discussed several studies of hand speeds (see 50 FR 12701–1) with divergent conclusions. Some indicated slower maximum hand speeds and others higher maximum hand speeds. OSHA also pointed out that Germany used 63 in/sec and Sweden used 100 in/sec.

Secondly, OSHA proposed to increase the safety distance by defining additional time elements and adding a factor for hand penetration through the sensing field. The four stopping time elements represented an extension of the previously established stopping time of the press into the four distinct increments of the total stopping time from initial presence sensing to full stop: (1) The presence sensing device response time; (2) the response time of interposing elements between the presence sensing device and the clutch/brake operating mechanism; (3) the increase in stopping time allowed by the brake monitor for brake wear (multiplied by a safety factor of two); and (4) the press stopping time (defined as the sum of the kinetic energy dissipation time plus the pneumatic/magnetic/hydraulic reaction time of the clutch/brake operating mechanism). The penetration depth factor incorporated into the calculation the distance an operator's fingers or hand could penetrate through the presence sensing field before detection, based on the minimum object sensitivity or blanking size.

The proposal particularly invited public comment on the hand speed constant because of the wide range of available data on the subject. Approximately one-half of the commenters who responded to OSHA on the proposal included comments on the constant (Exs. 18–6, –11, –15, –17, –19, –22, –23, –24, –25, –26, –32, –37, –38, –39, –40, –44, –46, –48, –49, –51, –52, –56, –57, –58, –60, –61, –63, –64, –65, –67, –68, –69, –71, –73, –75, –76, –77, –78, –79, –80 and –83). The preponderant position—in all but six of the 41 comments which addressed the subject—was in opposition to the increase in hand speed.

Frequently expressed, in 13 comments, was the fact that the commenters had never had knowledge of any accidents in which the hand speed of 63 inches/second (1.6 m/s) had been a factor. These commenters spoke of many years of experience as metal stampers or otherwise associated with mechanical power press operations, with lengths of experience stated as 13 years, 28 years, 3 years, 12 years, 13 years, 11 years, 2 years, 9 years, and 4 years. Typical of these comments was one from Service Stamping Inc. (Ex. 18–17) which stated:

> In our 28 years of experience in the metal stamping business, we never had an accident that was caused by the proximity of the hand initiated mechanism to the point of operation. Obviously, some of these years came under OSHA regulations requiring other safety devices, but a portion of this period covers operations not subject to the 63 inch/second hand speed, and still providing 100% safety for our employees.

Two commenters, however, did speak of knowledge of one or more accidents in which safe distance or hand speed was a factor. Consultant Peter N. Bosch (Ex. 18–25) mentioned investigating at least six light curtain related injuries in which the safety distance was a *disputed factor*. This commenter suggested that the hand-speed constant of 100 inches/second (2.54 m/s) be used in two hand trip calculations also. The other commenter, Sick-Optick-Electroniks (Ex. 18–57), stated that the hand speed of 63 inches/second (1.6 m/s) has only been a factor in one accident in their knowledge.

Six comments were received in support of the higher hand speed constant (Exs. 18–19, –22, –25, –51, –60 and –73). Two comments (Exs. 18–19 and –22) from the State of Maryland were

based on the experience of the Swedish, and the documentation and recommendation by NIOSH. Consultant Peter N. Bosch (Ex. 18–25) suggested that with complete hand freedom using PSDI, distance seems more critical than where other controls are used in conjunction with a conventional presence sensing device. Another consultant, Robert D. Jordan (Ex. 18–51), stated that the use of 100 inches per second (2.54 m/s) for hand speed is a move in the right direction and that evaluation of this hand speed constant should be continued. Mr. Jordan also stated that the greater "distance" should be used, based on other studies demonstrating hand speeds of 161 to 177 inches per second.

The comments from the National Institute for Occupational Safety and Health (NIOSH) (Ex. 18–73) discussed hand speed at length. In reviewing the hand speed research described in the OSHA proposal, it was mentioned that some of the studies had the subjects begin with their hands at zero velocity, but that the researcher (van Ballegooijen) later acknowledged that the early studies were based on procedures which obtained reach velocities which are not likely to be encountered in real press operations. In the Dutch study mentioned in the proposal, there are problems resulting from ambiguity as to the mean, median, mode, and range of average reach speed values obtained at various conditions, but the data suggests that at a 40 cm distance between the light curtain and the point of operation, the speeds obtained had a mean of 2.01 m/s (80 in/sec) and a mode of 2.0 m/s (79 in/sec) with a range of 0.05 m/s (1.9 in/sec) to 3.4 m/s (134 in/sec). The resulting frequency distribution indicates that out of 71 test values, 63 (89 percent) would be less than a speed of 2.54 m/s (100 in/sec), but the remaining eight (11 percent) would be faster. The suggestion is made to set the safety distance for the largest die, in order that smaller dies would provide some extra distance.

NIOSH further suggested that the safety distance formula be revised to show the numerical value of the hand speed constant separately, in order that the metric equivalent expression is not misinterpreted as a multiplier of the constant in inches per second. OSHA concurs with this suggestion, and the formula is so revised in the final rule.

Further, the suggestion was made that a recent NIOSH study on press operator hand movement also be included in consideration. This study simulated a power press operation for the measurement of normal hand reach speed as well as after-reach speed. A finding of the study suggests that a hand speed constant of 63 inches per second (1.6 m/s) would protect 50 percent of the power press workforce, but that a constant of 121 inches per second (3.07 m/s) would be required to protect 95 percent of the power press workforce.

Three commenters (Exs. 18–37, –39 and –76) pointed out that in PSDI operation, at the instant of press initiation, the operator's hand is moving out of the press. It would have to come to a full stop after moving some extra distance out of the sensing field and then start again in the opposite direction, toward the press, in order to approach the point of operation. These commenters believe, therefore, that the current hand speed constant of 63 inches per second (1.6 m/s) is adequate for PSDI; in fact, one of the commenters (Ex. 18–39) suggested that it should require a figure less than 63 inches per second (1.6 m/s), as they have had no accident experience resulting from the present use of 63 inches per second (1.6 m/s) in establishing safety distance for their press operations—involving operators' hand motion toward the point of operation rather than away from it.

From one consultant, Paul J. Glascow and several comments from the metal stamping industry (Exs. 18–6, –64, –71 and –76), concern was expressed that if the higher hand speed constant is used, the resulting increase in required safety distance could in fact create safety concerns. In Ex. 18–6, it was stated that a typical scenario with the higher hand speed could result in a safety distance of 26 inches (66 cm) which would not be considered safe and effective. The commenter described another scenario involving a mechanical clutch with eight engaging points which would develop a safety distance of 43.5 inches (1.1 m) with the higher hand speed; a distance described as neither workable nor safe. In Ex. 18–64 from AMSA, it was calculated that the higher hand speed constant, on a press with a total stopping time of 100 milli-seconds and a penetration depth factor of 3.5 inches (8.9 cm), would increase the safety distance from 13.6 inches (34.5 cm) to 19.5 inches (49.5 cm), with the result that the reach is prohibitive, and the potential for increased safety due to the PSDI benefits would be lost.

The Standard-Thompson Corporation (Ex. 18–71) stated that the higher hand speed constant would not only make operation of the press inefficient; it would result in operator fatigue and a lack of willingness to run the press. Mercury Minnesota (Ex. 18–76) expressed concern that if distances are increased, an operator may inadvertently be able to pass through the field, initiating a cycle.

The reason that lengthening the safety distances too much may decrease safety is that it increases operator fatigue, may make the operator's work operation awkward and may affect the operator's balance. These factors may lead to accidents.

A sizable number of commenters, including three metal stampers, two press manufacturers, one device manufacturer and a consultant (Exs. 18–6, –24, –38, –40, –49, –64, –71 and –80), were concerned that the increased safety distance resulting from the higher hand speed constant would render PSDI unworkable and infeasible.

Further, a significant number of commenters of similar affiliations (Exs. 18–24, –38, –40, –46, –56, –57, –58, –61, –63, –64, –80 and –83) discussed the fact that the new safety distance formula not only increased the hand speed constant but also listed additional time elements and added a totally new concept—the penetration depth factor—the combination of which results in unnecessarily long safety distances. Interlake Stamping (Ex. 18–63) pointed out that the safety distance formula which was used at the time of approval of the initial variance request for PSDI utilized a hand speed constant of 100 inches per second (2.54 m/s) but had only a single time element, Ts (stopping time). It was calculated that if 63 inches per second (1.6 m/s) were substituted for 100 inches per second (2.54 m/s) in the proposed new formula, the safety distance would be approximately the same as would be developed using the 100 inches per second (2.54 m/s) in the initial variance request formula. The point was made that the lower hand speed constant is sufficient when used with the new formula, the rationale being the zero-accidents safety record demonstrated during the nine-year period of PSDI operation at the firm.

Another commenter, the American Metal Stamping Association (Ex. 18–64), discussed the establishment of its Project Committee on PSDI, which was composed of representatives of a broad range of interests, and the endorsement by the Committee of a safety distance formula incorporating the additional elements contained in the proposed formula but with a 63 inches per second (1.6 m/s) hand speed factor. This commenter stated that the combination of the higher hand speed factor with the additional elements is unwarranted, and that there is no evidence to suggest, based on actual reports of injuries in metal stamping operations, that 63

inches per second (1.6 m/s) is insufficient.

Earlier, it was stated that some commenters referred to the fact that the Swedish National Board of Industrial Security uses a hand speed constant of 100 inches per second (2.54 m/s). As stated in the proposal, it was the Swedish experience which was the basis for the design of the PSDI operation for the Interlake Stamping Corporation variance. Although 100 inches per second (2.54 m/s) is used as the Swedish mechanical power press hand speed constant, the Swedish safety distance formula is less stringent than the OSHA proposed formula because it does not include all of the elements of the OSHA formula.

Several commenters (Ex. 18–56, –76, –77 and –83) discussed the German experience. They pointed out that 63 inches per second (1.6 m/s) has been used safely and successfully for many years in similar applications there.

OSHA has reviewed and carefully evaluated the comments and evidence in the record concerning hand speed and safety distance. The extensive research which has been documented demonstrates a broad range of hand speed capabilities. Although there is some question concerning the real world applicability of some of the test results, with some researchers indicating that certain reach velocities are not likely to be encountered in real press operations, OSHA agrees that there is a sufficient body of findings to demonstrate a broad range of hand speed capabilities, the upper limits of which may exceed both the current and proposed hand speed constants.

Even though such high hand speed capabilities have been demonstrated by the research, a practical question is raised by the fact that an overwhelming majority of the commenters can cite no accident experiences in which hand speed was a factor. In evaluating the importance of hand speed, it is recognized that the practical objective of considering hand speed capability is only for the determination of a hand speed constant to calculate the necessary safety distance between the sensing field and the point of operation. The hand speed constant is only one element in the formula used to calculate the safety distance. The current safety distance formula specified in 29 CFR 1910.217(c)(3)(iii)(*e*) includes only two factors: the hand speed constant of 63 inches per second (1.6 m/s), and the stopping time of the press. The new safety distance formula is more stringent, in that it defines four stopping time elements—the presence sensing device response time, the response time of interposing elements between the presence sensing device and the clutch/brake operation mechanism, the increase in stopping time allowed by the brake monitor for brake wear (multiplied by a safety factor of two), and the press stopping time—and adds an additional element, the penetration depth factor, representing the distance an operator's fingers or hand could penetrate through the sensing field before detection.

A significant point in comparing the current formula with the proposed new formula was made in the comments from Interlake Stamping (Ex. 18–63) which were discussed above. The safety distance formula which was used for the approval of the initial variance request for PSDI was based on the Swedish experience, using a hand speed constant of 100 inches per second (2.54 m/s) with only the single stopping time element. Thus, the safety distance used for the variance request was based on the formula and hand speed constant used successfully in Sweden since the 1950's. It is noted that the formula used was the same as the current formula specified in 29 CFR 1910.217(c)(3)(iii)(*e*), with the exception that the higher hand speed constant was used for the PSDI operations under the experimental variance.

However, in the proposal, OSHA not only increased the hand speed but added four additional factors to be considered in calculating the safety distance each of which would increase the safety distance. Consequently, the OSHA proposal would have lengthened the safety distance substantially more than the Swedish requirement and the requirement for the variance.

Interlake has calculated that the use of a hand speed constant of 63 inches per second (1.6 m/s)—instead of 100 inches per second (2.54 m/s)—in the proposed new formula with the additional elements would result in approximately the same safety distance as that which was derived from the formula which was used to establish the safety distance for the variance and used in Sweden; that is, the higher hand speed and only the single time element.

OSHA has calculated the differences in safety distances derived from the experimental variance formula versus safety distances which would be derived from the proposed new formula using 63 inches per second (1.6 m/s) instead of 100 inches per second (2.54 m/s). Over a broad range of time elements, including various combinations of times considered reasonably likely to be acceptable for PSDI, the safety distance derived from the proposed new formula using 63 inches per second (1.6 m/s) was somewhat greater than that derived from the experimental variance formula in each case. In the lower end of the range—representing the faster stopping times—the greater safety distance was as much as half again the length of the shorter one. In the upper end of the range—representing the slower qualifying stopping times, the greater safety distance was approximately five to six inches greater.

After reviewing the substantial body of evidence and opinions, OSHA concludes that the 63 inch per second hand speed constant with the five-element formula will result in a safe safety distance. It leads to a slightly larger safety distance than the formula that is used in Sweden and in the experimental variance which will be somewhat safer for the employees. This increase is appropriate because presses will be used more widely than the more controlled condition of the variance. The final result reflects the view of most of the comments received.

As an alternative, OSHA considered the option of using a safety distance formula which would retain the hand speed factor of 100 inches per second (2.54 m/s) but would delete the added time elements and penetration depth factor—comparable to the time element in the current formula specified in 29 CFR 1910.217(c)(3)(ii)(*e*). While this would be the same formula used in the experimental variance at Interlake, and has been demonstrated to be effective, OSHA has opted not to use such a formula. OSHA has determined that it is preferable to identify in the formula the individual components of the stopping time of a press. Not only will this present the capability for more precise evaluations in the certification/validation of the safety system; OSHA believes it will help identify critical components and provide incentive for design improvements where appropriate.

Based on the comments which have been received on hand speed, OSHA has determined that the use of a hand speed constant of 63 inches per second (1.6 m/s)—rather than 100 inches per second (2.54 m/s)—in the new safety distance formula will provide a level of safety at least equal to or greater than that which has been provided in any of the successful PSDI operations known to OSHA. In addition, it will provide for a realistic and usable safety distance, with the result of a further potential for increased safety due to the other benefits of this rulemaking, including safety system certification, enhanced

control reliability, and improved training requirements.

OSHA concludes that the evidence indicates that the additional increase in the safety distance of the proposal through increasing hand speed as well as adding elements would not further increase safety. By increasing operator reach, it will increase fatigue and awkwardness of use which would cancel the benefits of the increase in distance. OSHA further concludes that its final decision properly balances all factors, based on the evidence in the record.

The American Metal Stamping Association (Ex. 18–64) suggested that minor improvements be made in the definitions for two of the time elements in the safety distance formula. It was suggested that the definition for Ts be modified by adding the word "the" in the first sentence so that the phrase reads, "* * * the longest of *the* three averages is the stopping time to use." It was also suggested that the definition for Tm be modified to add the word "press" in two locations where "stopping time" is discussed. OSHA agrees that these suggestions will enhance clarification and understanding of these definitions, and the definitions are so revised in the final rule. In addition, the definition for Tm is to be further revised to reflect the alternative of permitting an increase of 10 milliseconds or 10 percent of the longest stopping time of the press, whichever is longer, in accordance with the comments discussed earlier regarding paragraph (h)(5)(iii).

In paragraph (h)(9)(vi), the presence sensing device location is required either to be set at each tool change, or to be fixed in location to provide the required safety distance for all tooling set-ups. OSHA believes either method will ensure the necessary safety distance. Where the adjustable set-up is used, paragraph (h)(9)(vii) requires the use of a special tool available only to authorized persons. OSHA believes this is necessary in order to prevent unauthorized changes in the presence sensing device location which might place the sensing field too close to the point of operation and, thus, result in exposure of the operator to injury at the point of operation. These paragraphs received no comments.

Paragraph (h)(9)(viii) requires supplemental safeguarding to protect all areas of access to the point of operation not protected by the PSDI presence sensing device. Such supplemental safeguarding is considered a component of the safety system because of its importance for worker safety during PSDI. It is limited to either additional presence sensing devices or to other types of guards meeting the standard, and is required to be interlocked with the press control to prevent press PSDI operation if the guard fails, is removed, or is out of position. If a presence sensing device is used as a supplemental safeguard, it can not be used to initiate a press stroke but is required to meet the requirements of the standard.

Guardimark International, Inc. (Ex. 18–66) expressed concern that this provision would impose an additional restriction on PSDI, and questioned the need for it. OSHA is retaining this requirement in order to ensure that all areas of access to the point of operation are protected during PSDI operation. Because the backup safety of dual palm buttons or other safeguards are not used, the increased reliability of the system is needed.

Paragraph (h)(9)(viii)(B) requires interlocking of supplemental safeguards to prevent PSDI operation if the supplemental safeguard fails, is removed or is out of position. Three comments were received on this paragraph. The Minster Machine Company (Ex. 18–18) suggested that the supplemental safeguards be certified because simple interlocking may not be adequate for PSDI. The Motor Vehicle Manufacturers Association (Ex. 18–45) requested deletion of this paragraph because there is no demonstrated need for interlocking supplemental guards on presses.

OSHA has considered these two comments, and concludes that supplemental safeguards are of sufficient importance to be included in the certification requirement. As just stated, the backup safety that dual palm buttons or other safeguards provides does not exist and therefore the increased system reliability of certification is appropriate.

It had been OSHA's intention in the proposal to consider supplemental safeguarding as a part of the safety system. In order to prevent misunderstanding, the final rule is revised to so state, and thus to include it in the certification requirement. AMSA (Ex. 18–64) suggested that the word "fail" be removed from this paragraph because it relates more to electrical or electronic devices rather than guards or barriers. Since the standard does permit the use of presence sensing devices as supplemental safeguards, the word "fail" is considered appropriate, and no change is made.

Paragraph (h)(9)(ix) originally required the installation of barriers or supplemental light curtain presence sensing device safeguards to prevent the situation where personnel could pass completely through the PSDI presence sensing device sensing field. OSHA believes that, without such safeguards, there is a potential for triggering a stroke initiation by inadvertent interruption of the field while the operator is still on the point-of-operation side of the presence sensing device. One comment from Guardimark International, Inc. (Ex. 18–66) was received that requested the words "light curtain" be removed from this paragraph to allow other types of presence sensing device use. Although OSHA believes that the only current presence sensing device suitable for PSDI use—either for stroke initiation or for protecting other areas of access to the point-of-operation—is the light curtain inasmuch as it is the only device currently in use for which there is experimental evidence of safety, considering its successful integration into the entire safety system. The requested deletion is, however, being made to permit other types of supplemental presence sensing device safeguards provided equivalent safety and reliability are maintained. In addition, OSHA has added a new subparagraph to § 1910.217(h) to encourage the development of new technology and to assure that regulatory approval of such technological advancement will be done efficiently.

To allow for advancements in technology, (h)(9)(ii)(B) provides the procedure for obtaining approval for alternatives if they are demonstrated to be as safe and reliable as light curtains.

Paragraph (h)(9)(x) requires that hand tools be designed, either by tool handle thickness or tool length, to ensure that the intrusion of the hand tool or an operator's hands into the sensing field of the PSDI presence sensing device will be detected during the entire period of hand tool use. This is required to be suitable for any safety distance determined by the press set-ups. Stroke initiation while a hand tool is in the point of operation could seriously injure the operator by fly-back of the tool or its parts, or by forcing the operator's hand against the press or another object. Two comments (Exs. 19–19, –22) were received to this paragraph which suggested adding the words "and larger than any blanked out (fixed or floating) band width." As mentioned above, OSHA has deleted the proposed provision in (h)(9)(iv) which would have allowed blanking, so there now is no need for the suggested revision to (h)(9)(x).

Section 1910.217(h)(10), "Inspection and maintenance." Paragraph (h)(10)(i) requires that a test rod, with

accompanying instructions for its use, be provided to ensure the object sensitivity capability of the presence sensing device and to facilitate appropriate inspection and maintenance.

Three comments were received to this paragraph. From the Alcona Associates, Inc. (Ex. 18–12), a suggestion was received regarding this and several other provisions that if this is required for PSDI, it should be required in other methods of initiation as well. As mentioned earlier, this rulemaking can only address PSDI-related changes to the standard. The Minster Machine Company (Ex. 18–18) stated that there is a need for "highly qualified" maintenance personnel. To attempt to set qualification requirements for maintenance personnel is considered beyond the scope of this rulemaking. OSHA believes the mandatory provisions of the standard require the employer to have an effective maintenance program. The certification/validation provisions of the standard enhance the reliability of the program. Guardimark International, Inc. (Ex. 18–66) objected to the restriction to light curtain use. This aspect has been commented on above, for paragraph (h)(9)(ix).

Paragraph (h)(10)(ii) in the proposal listed the specific checks at the beginning of each shift or whenever a die change is made which OSHA believes are necessary to ensure that the designed safety features are fully operational. It was the intention in the proposal that the checks be made at least at the beginning of each shift and more often if die changes are made more often. In view of the fact that there will be operations in which dies are changed less frequently than once each shift, the provision is revised in the final rule to clarify the intent to require the checks at the beginning of each shift *and* whenever a die change is made. The checks will include: Tests of the PSDI and supplemental safeguarding; checks of the safety distance; and verification of the correct counterbalance adjustment. As with paragraph (h)(10)(i), one objection from Guardimark International, Inc. (Ex. 18–66) was received to this paragraph because of the restriction to light curtain safeguarding. As discussed earlier, the use of other presence sensing devices may be used where safety and reliability equivalent to that obtained with the light curtain can be demonstrated. Another commenter suggests that subparagraph (E) be revised to require a "system or visual" check, apparently to prevent any misunderstanding which might result in a more rigorous check. OSHA agrees, and the final rule is revised to reflect this change.

Paragraph (h)(10)(iii) reflects OSHA's belief in the necessity to inspect, lubricate, and maintain flywheels and bearings in order to preclude bearing seizures and possible uncontrolled press strokes. There were no comments to this paragraph. Therefore, it remains unchanged from the proposal (50 FR 12712).

Paragraph (h)(10)(iv) requires periodic inspections of clutch and brake mechanisms in accordance with the press manufacturer's recommendations. OSHA believes that compliance with the manufacturer's recommendations should ensure continued full operational capability of the clutch and brake mechanisms. The Motor Vehicle Manufacturers Association (Ex. 18–45) recommended that this paragraph be deleted. The commenter objected to the requirement that the manufacturer's recommendations be followed, on the basis that the inspection requirements in paragraph (e) of the standard are adequate. Because of the importance of the clutch and brake mechanisms for safe operation in the PSDI mode, and the fact that the clutch/brake inspection requirements in paragraph (e) do not apply to presses which comply with the standard's requirements for control reliability and brake monitoring, OSHA believes it important that the manufacturer's recommendations also be followed.

Paragraph (h)(10)(v) provides that any condition of failure, non-compliance, or improper adjustment which may be revealed by the checks specified in paragraphs (h)(10) (ii), (iii), or (iv) must be corrected before any further operation of the press is attempted. No comments were received on this paragraph, therefore, it remains unchanged from the proposal (50 FR 12712).

Paragraph (h)(10)(vi) requires that the employer ensure the competence of personnel who would care for, inspect, or maintain presses equipped for PSDI operation, through initial and periodic training. OSHA believes the continuing inspection, care, and maintenance of the presses is critical to the continuing safety of the operator. No comments were received on this paragraph, therefore, it remains unchanged from the proposal (50 FR 12712).

Section 1910.217(h)(11), "Safety system certification/validation." This paragraph requires three specified certifications of the PSDI safety system by the manufacturer or employer and validations by an OSHA-recognized third-party validation organization. The PSDI safety system, as explained above, includes not only the presence sensing device but pertinent elements of the press, brake, clutch, controls, safeguarding, etc., integrated together.

Specifically, the "certification/validation" term refers to an organized system under which the manufacturer/fabricator, employer, and/or their representatives certify that a PSDI safety system meets all requirements of this standard, and a testing/validation organization, which is independent of employers or manufacturers and which is recognized by OSHA as having a reasonable level of expertise related to the PSDI standard, validates the certifications. The third-party validation concept is also described in ANSI Z–34.1–1987, the American National Standard for Certification—Third Party Certification Program.

The three specified certifications/validations in this PSDI standard are (1) design, (2) installation, and (3) annual. The design and installation certifications/validations would be required before the initial use of the press, and the certification/validation on an annual basis thereafter. The specific requirements for arriving at necessary certifications/validations are detailed in Appendix A to § 1910.217. This entire process is referred to as "certification/validation" in this preamble section. See the definitions of certification and validation in § 1910.211(d) (64) and (65), and the defintion of certification/validation in § 1910.211(d)(66).

The design certification/validation would operate in the following manner. A manufacturer or fabricator (which conceivably could be an employer) would design, manufacture and/or assemble, analyze and test the system. The manufacturer/fabricator would certify, based on the tests and analyses performed, that its PSDI safety system meets the requirements of the PSDI standard. The OSHA-recognized validation organization validates, through its own examination, that the design certification is correct and that the PSDI safety system meets the requirements of the standard. It does this through review and validation of the analyses and tests of the manufacturer and other analyses and tests of the PSDI safety system which may be required by the standard or deemed necessary by the recognized validation organization itself.

Subsequently, the employer would install and maintain the PSDI safety system pursuant to the requirements of

the PSDI standard, and would so certify to the validation organization. The recognized validation organization validates the employer certification, upon installation and at least annually thereafter, that the PSDI safety system as installed is meeting the PSDI standard and is in accord with any special conditions established under the design certification/validation. (Recertification/revalidation may occasionally be required on a more frequent than annual basis under certain special conditions.)

OSHA proposed that third-party certification be required for use of PSDI (50 FR 12703, 12707, 12712–13). At the time of the proposal, OSHA used the term "certification" to apply both to what is called "certification" and "validation" in the final standard. The comments reflect the earlier terminology. The reasons were that when OSHA initially rejected the use of PSDI in 1974 (39 FR 41844), it felt that a certification system was necessary for proper use to protect employees. The European countries which permitted PSDI, and used it safely, had procedures for prior government approval of the equipment and components used in PSDI systems.

OSHA believed that it was important for safe operation that PSDI safety systems are designed, installed and maintained pursuant to the requirements of the standard. OSHA also pointed out the technical nature of the standard and consequently the usefulness of third-party certification to verify compliance.

OSHA stated that it believed that an OSHA-recognized third-party certification program would present a feasible administrative mechanism for assuring that the PSDI safety systems are designed, installed and maintained in accordance with all requirements of this section. OSHA referred to a separate rulemaking action (49 FR 8326, March 6, 1984) (Ex. 17), where OSHA proposed revisions to 29 CFR Parts 1907 and 1910 for new regulations covering OSHA recognition of testing-related agencies and certification programs. OSHA made the rulemaking record of that proceeding part of this proceeding and requested comment on that view or whether an alternate approach to third-party certification would be more appropriate.

OSHA also stated that the general rulemaking on third-party certification, which includes an OSHA procedure for recognition, might not be completed by the time OSHA was ready to issue a final PSDI standard. Consequently, it requested comment on an appropriate interim approach to certification just for PSDI until such time as there was a general framework in effect (50 FR 12707). OSHA also stated it would prefer a less detailed certification system if it would fulfill the requirements of the standard (50 FR 12713).

There were 22 general comments in response to certification. Over one-half of the responses supported third-party certification without qualification because they believed it would improve employee safety and is necessary for safe use of PSDI. Another one-third supported third-party certification but raised questions such as what organizations would do it, what protection from the liability standpoint would be available, and what controls would be available. Less than one-quarter of the 22 responses did not support third-party certification for various reasons, including a preference for self-certification, doubt that such a program would be feasible, and belief that it would be beyond OSHA's authority.

There were a number of reasons given in the comments supporting certification. For example, Anchor Fabricating (Ex. 18–7) stated it supported certification because:

> * * * the certification programs help to insure that these technological improvements do not deteriorate through abuse nor neglect.

The Travelers Insurance Companies (Ex. 18–16) stated:

> We recognize that OSHA is relying upon 3rd party certification to assure the safe use of PSDI and we concur that this is a significant and necessary measure.

The Wiremold Company (Ex. 18–32) commented on third-party certification that:

> Again, we feel that proper integration of the safety system is essential, and that a responsible certifying authority *must be* utilized.

See the comments along similar lines in Exs. 18–17, –24, –48, –75, –76 and –83. Many of these comments are by press users. Interlake Stamping (Ex. 18–63), the company which has been using PSDI under the variance, also supported the need for certification.

There were also more detailed comments supporting certification. The Forging Industry Association (Ex. 18–30) stated that third-party certification "is a critical requirement if we are to establish and maintain the desired level of power press safety." They gave several reasons for this conclusion including the need to assure an appropriate level of maintenance and the need to assure that the electrical and mechanical systems are accurately interfaced with the press.

The National Safety Council (Ex. 18–55) stated:

> * * * we are convinced that the third party certification requirements that are part of the proposed rule are not only essential, but critical if the desired level of power press safety is to be achieved.

The Council generally was opposed to PSDI and preferred NHID to HID but felt if OSHA were to adopt PSDI that third-party certification was crucial for safety.

The American Metal Stamping Association (Ex. 18–64) which represents companies which use power presses as well as companies which supply them with equipment, strongly supported an OSHA recognized third-party certification program. It felt that certification, along with OSHA's reasonably detailed safety requirements, was needed to assure that a suitable control system was used and that the press was properly maintained. It pointed out that in view of the large number of types of presses, light curtains, clutch brakes, etc., available, there was a need to make sure that "the entire system is carefully designed, constructed, installed and maintained to assure proper and safe operation." (p. 2)

AMSA stated:

> The type of certification that is needed for PSDI is relatively straightforward. Technically competent people—who are scrupulously unbiased—must review diagrams, tests, failure mode analyses, performance benchmarks, etc., to determine that elements of the safety system are designed, manufuactured, integrated, installed and maintained in conformance with requirements of the proposed new paragraph (h). Conflicts of interest must be avoided. And the benefits of "third-party" certification, as opposed to self-certification, are obvious.

AMSA believed that manufacturers of the various elements of the PSDI safety system, and employers who wish to use the PSDI mode, should be required to submit tests, diagrams, performance benchmarks, etc., to the third-party organization which would need to be reviewed and verified. It also believed that extensive additional tests performed by the recognized certification program should be avoided, where feasible, with the emphasis on review and verification. (p. 4)

AMSA made a number of technical recommendations on certification which are discussed below. It also stressed the importance of not delaying PSDI until a general procedure of OSHA recognizing third-party certification programs was in operation if there was to be a substantial delay. It supported an interim procedure if that were the case and stated their Board of Directors had

authorized "an AMSA sponsored" private sector initiative for third-party certification of PSDI safety systems.

Danley Machine Corporation (Ex. 18–72) is a manufacturer of presses. It stated:

> In our opinion the proposed rules reflect the culmination or a very careful extensive program of investigations regarding PSDI. Further we would have to believe that operation under the proposed rules would result in a higher degree of safety than exists today in many applications. If, in fact, the requirements for Certification of a Safety System and the Safety System itself can be implemented, it would be a giant step in a safe direction.

A number of other comments supported some type of third-party certification, but with qualifications or recommended substantially different approaches than the one OSHA proposed. One presence-sensing device manufacturer supported third-party certification but recommended that OSHA directly appoint Underwriters Laboratories because of their experience and capabilities (Ex. 18–37, ISB Products). Data Instruments (Ex. 18–40) stated that "Generally, we agree with the need for certification," but believed a substantially simpler PSDI safety system was more appropriate. They felt the electronic, electro-mechanical, and pneumatic control systems should be certified, but not the press and clutch/brake because there were too many variations of the latter to make it practical except for new machines. They felt fewer tests were needed for design certification but supported installation certification and annual checks.

Robert D. Jordan (Ex. 18–51), a professional engineer, felt that no technical reasons to prohibit PSDI existed now, but felt human factors still existed. However, he supported certification if the certifier had financial responsibility. Several commenters (Exs. 18–, –12, –60) felt certification was a good idea but would not be practical from a products liability aspect either, because it would not relieve the manufacturer from liability or the liability of the certifier. Sick-Optik-Electronik (Exs. 18–56, –57, –78), a manufacturer of light curtains and PSDI systems, supported third-party certification but felt OSHA should not set specifications for tests and analyses. It stated that those details should be left to the certifier because it believed this would be more practical and stated that many organizations have the capability to certify PSDI and indeed guidelines already existed.

Guardimark International (Ex. 18–66), a manufacturer of electronic safety devices, was in favor of certification but not third-party certification. They believe that manufacturers do proper testing of their equipment to make them safe especially because of the need to minimize product liability. They felt that the qualification of the third-party certifier "cannot be predicted." They stated that a respectable certifier did a skilled analysis of one of their products but made serious errors in the analysis of another device. They recommended that the certification be limited to confirmation of the manufacturers' analyses by government employees.

There were several comments generally critical of certification. The Computer and Business Equipment Manufacturer's Association (Ex. 18–34) stated:

> CBEMA opposes the requirement for third-party certification. This is, in our view, an unwarranted prohibition of a manufacturer's self-certification program. This requirement would add an unnecessary cost, without any increase in safety to a system that is already functioning safely and successfully.

Verson Allsteel Press Company (Ex. 18–2) did not object to the concept of certification, but believed an effective certification program could not be devised.

Two trade associations strongly objected to third-party certification. The Motor Vehicle Manufacturers Association (Ex. 18–45) proposed the use of a "qualified person" instead. They stated:

> The certification process which requires the utilization of the independent third party certification program recognized by OSHA in accordance with the final procedure specified in the **Federal Register**. 29 CFR 1936 does not add materially to the safety of the operations of the PSDI operating mode. The requirement of Appendices A and B are really beyond the state of the art in safeguarding employees and really beyond the scope of this rule. A better approach to insure the proper operation of a press is to use a qualified person as defined in ANSI/ASME B30.2–1983:
>
> "A qualified person is defined as a person who by possession of a recognized degree or a certificate of professional standing, or who by extensive knowledge, training and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter and work."
>
> Using this definition, the cost and time involved with certifying the proper operation of a press will be materially reduced without increasing the risk.

The National Electrical Manufacturers Association (Ex. 18–43) was critical of both PSDI generally and the certification concept. They stated that electrical mechanical interference (EMI) in the workplace might interfere with the safe use of PSDI and that "EMI from all sources cannot possibly be anticipated through the proposed third-party certification system."

They further stated that they did not believe annual recertification was sufficient to keep the PSDI press in "non-degraded" condition. "Practical experience in the workplace indicates that controls, even those necessary for safety, will be changed by operators and others. These inevitable changes will result in a control system which is inconsistent with the certification * * *."

NEMA also stated:

> This proposed rule is particularly undesirable because NEMA members who manufacture a component or subassembly of a punch press are not likely to have control over how it is ultimately used in the workplace. Nevertheless, the rule could expose such manufacturers to liability under the present product liability law. The employer, upon whom the proposed rule is dependent and over whem OSHA has sole jurisdiction, is in most states free from liability exposure because of the workers' compensation laws. This shield minimizes the employer's motive to maintain the extremely high degree of safety demanded by this proposed control. Regardless of whether OSHA is convinced that injuries will occur or not, adoption of this proposed rule should include provisions which eliminate liability exposure by the manufacturers whose products become a part of the system.

Further, NEMA makes the following two arguments:

> By this rulemaking, OSHA attempts to delegate its regulatory decision to the design process by manufacturers. Even if one grants the proposition for the sake of argument that OSHA has jurisdiction over product design, it is questionable as a matter of administrative law whether the proposed delegation in this rulemaking without sufficient criteria for oversight can withstand judicial scrutiny * * *
>
> The design certification requirements on manufacturers are particularly onerous because of the degree ot which OSH intrudes into the product development process. The Appendix describes all of the information that must be submitted to the certification program for approval.

Finally, NEMA points out that completing the third-party certification rule may take OSHA a long time and it might be challenged in court. Therefore, it would not be ready for use for PSDI. Also NEMA believes the PSDI rule will require more data to be submitted to the government than the government really needs.

OSHA has carefully reviewed all the comments on this requirement for design, installation and recurrent certification by an OSHA-recognized third-party certification program to assure that the PSDI safety system meets the requirements of the PSDI

standard. Based on its review of the comments, evidence in the record and analysis, OSHA concludes that such a requirement is needed for safe use of PSDI.

One major reason OSHA has concluded that certified PSDI can be safely used is the European experience of safe use. The European experience includes strict control of specific manufacturers' products used in PSDI operations—an arrangement which is neither practicable nor desirable in this country. Certification/validation of the safety system is recognized as an alternative method to ensure that the design, installation, and ongoing use of the safety system will meet the standard. While it cannot be stated with certainty that certification/validation will provide the equivalent degree of control as the European system, the most logical conclusion from the European experience and the experiential evidence is that a certification/validation program is necessary for safe use of PSDI.

Secondly, a safe PSDI system requires the proper integration or interfacing of a number of sophisticated mechanical and electrical systems such as the press, clutch/brake, sensing device and controls. Review and validation of the manufacturer's design and tests on whether the PSDI press meets the requirement of the OSHA standard will lead to substantially greater certainty that there has been proper integration and interfacing of the various systems and components. This conclusion of OSHA's has been strongly supported by a number of commenters quoted above, including the Wiremold Company, the Forging Industry Association (FIA) and the American Metal Stamping Association (AMSA).

Thirdly, there is no dispute that systems such as PSDI presses need to be installed and maintained properly to keep them operating properly. Installation certification and recertification at least annually will clearly lead to a higher standard of operation because there will be regular checks by a competent independent party that the safety systems are properly maintained and operated. Many commenters, such as Anchor Fabricating, FIA and AMSA quoted above, strongly believe installation and recurrent certification is necessary to maintain safe operation of PSDI systems, and OSHA concurs in this view for the reasons stated.

Finally, OSHA has the authority to set up mechanisms such as third-party certification which will lead to more protective and reliable safety systems.

One of the commenters which disagreed with third-party certification, the National Electrical Manufacturers Association (NEMA), argued, as quoted above, that annual recertification was not sufficient to prevent "degradation" or changes in the controls by operators or others. But the annual revalidation by an independent third-party will certainly do more to encourage employers to maintain and prevent changes in controls and more likely catch and correct improper maintenance and control changes, than if no such third-party recertification/revalidation requirement existed. Currently, accidents occur on non-PSDI power presses for a number of reasons, including poor maintenance or operators or employers changing or interfering with safety devices. It is clear to OSHA that third-party recertification/revalidation will not only maintain a high level of safety for PSDI presses but will add a safety factor for PSDI presses which does not currently exist for non-PSDI presses. The selection of at least an annual frequency for the recertification provision in the standard was endorsed by the commenters as a reasonable means of encouraging and controlling proper maintenance of the safety system, without being so restrictive that PSDI might be rendered impractical to implement. (See the comments of Danley Machine above which also make this point.)

OSHA believes the "qualified person" concept, as recommended by the Motor Vehicle Manufacturers Association, is not the most effective method of accomplishing the purpose of certification. Rather, the scope and complexity of PSDI warrant more than one individual's view or professional experience. The requirements and qualifications listed for a third-party certification program (now called "validation organization" in the final rule) bring to the process an organization approach which is considered more appropriate.

A wide variety of different interests supported OSHA's proposal that there be an OSHA-recognized third-party certification program. This included several major trade associations, many press users, several equipment suppliers, the National Safety Council and a major insurance company. This wide range of support from parties with expertise in the area is additional support for the value of third-party certification in maintaining safety.

OSHA believes the views expressed by those who objected to third-party certification are not convincing. The Computer and Business Equipment Manufacturers' Association argued that the program would be "an unwarranted prohibition of a manufacturer's self-certification program." But the OSHA standard does not prohibit manufacturer certification at all. Rather, it provides that an outside party validate (that is verify) the employer's or manufacturer's certification and tests.

The Motor Vehicle Manufacturers Association argued that third-party certification and the requirements of Appendix A were not necessary and could be replaced by review by a qualified individual. The requirements of Appendix A are the result of the recommendations of many experts and essentially this entire preamble explains their necessity. It is clear to OSHA that a qualified validation organization, guided by requirements which are the result of recommendations of experts in the field, will be in a better position to assist in maintaining the safe use of PSDI than review by a vaguely defined qualified individual without any particular guidance as to the type of review.

The lengthiest discussion disagreeing with the need for third-party certification came from the National Electrical Manufacturers Association (NEMA). Their arguments are quoted at length above and the one on possible degradation in operation is responded to above. A second contention they make is that manufacturers of PSDI safety systems will not have adequate control over how they are used in workplaces. In fact the opposite is true. The requirements of the standard which the employer is required to meet and the existence of the installation certification/validation and at least annual recertification/revalidation will give a reasonable degree of assurance that PSDI presses are used and maintained properly. Indeed the existence of this standard and certification/validation will give manufacturers greater assurance that their equipment will be used properly than is normally the case. Normally, there is less control and no regular independent review of how equipment is used and maintained in the workplace.

A further set of arguments made by NEMA is that on the one hand OSHA is improperly "attempt(ing) to delegate its regulatory decision to the design process by manufacturers," but on the other hand the requirements of the standard and certification process "are particularly onerous because of the degree to which OSHA intrudes into the product development process." These two arguments appear mutually contradictory. The PSDI standard does

set some reasonably concrete safety requirements to be met. Those responsibilities have not been delegated. The responsibility on how to design the PSDI press to meet those requirements is left with the manufacturer. The certification/validation program validates that the press does indeed meet the standard's requirements. OSHA is setting forth necessary safety requirements but it leaves to the manufacturer responsibility for designing the press to meet safety requirements.

NEMA raises questions about possible electromagnetic interference (EMI) with safe use of PSDI and whether third-party certification could anticipate all possible sources. There are specific requirements to test for and control EMI and the existence of a certification/validation program is more likely to detect and avoid EMI than without such a program. Safe use of PSDI in Europe and use of light curtains as guards in the U.S. indicates that EMI has been safely controlled.

As quoted above, several commenters made more limited criticisms of OSHA's proposal. One suggested that OSHA appoint Underwriters Laboratories, Inc., as the third-party certification program. However, OSHA does not want to prevent other qualified providers from supplying the services.

Several commenters argued that certification would not end manufacturers' product liability or raised other product liability issues. Section 4(b)(4) of the OSH Act states:

> Nothing in this Act shall be construed to supersede or in any manner affect any workmen's compensation law or to enlarge or diminish or affect in any other manner the common law or statutory rights, duties, or liabilities of employers and employees under any law with respect to injuries, diseases, or death of employees arising out of or in the course of, employment.

Consequently, termination of common law causes of action would not generally be within OSHA's authority. However, OSHA believes that the PSDI standard will improve press safety and consequently fewer accidents will arise to occasion liability questions.

Several commenters felt the areas covered by the certification requirement should be narrowed and one questioned the competence of certification organizations. As discussed throughout this document, the PSDI standard is based on the recommendations of many experts, the European and OSHA variance experiences, the need for proper integration of components, the need for proper periodic maintenance, and the general support of most commenters. OSHA believes, therefore, that the final regulations are the best approach to PSDI safety and that the scope of certification/validation properly balances an appropriate level of review of equipment and operations without excessive interference in design or employer responsibilities. If experience with PSDI in the workplace indicates a lesser or greater role for certification/validation is needed, OSHA will consider that based on the shopfloor experience.

The Agency currently believes that its approach to OSHA recognition of third-party validation organizations under the PSDI standard attains the proper balance of utilizing a competent and effective third-party validator to improve safety without excessive interference into the details of the program for PSDI safety systems. (OSHA intends to study the long term effectiveness of its certification/validation program resources permitting.) OSHA is reaching no conclusions on the appropriateness of the PSDI approach for other areas. As mentioned above, OSHA has an ongoing rulemaking on third-party certification programs generally and it will reach its final conclusions on the general issue in that rulemaking. OSHA may later change PSDI's approach to recognition to be equivalent to its final decisions on the general issue depending on the evidence and views presented in the general rulemaking. However, OSHA agrees with many of the commenters that an OSHA certification/validation program is needed now for PSDI safety systems so that implementation of PSDI, a safe and productive technology, is not further delayed.

In the comments from States with their own OSHA-approved occupational safety and health programs, or State plans, it was suggested that the Secretary of Labor or the responsible official of a State plan State be notified when a PSDI capability has been added to a press. The reason stated for this was that there would be need for action on the part of the compliance organization to review the installation. Rather than impose a reporting burden on the employer, the procedures for the certification/validation program include provisions for making available, listings of certification/validation actions.

Regarding application of the certification/validation requirements in State plan States, OSHA would consider any State standards which do not provide for the full scope of certification/validation, either is required by this standard or by an equivalent certification/validation program, to be less effective than this standard. A state may alternately accept Federal OSHA approved rather than initiate its own program. OSHA also would anticipate that all State plan States would accept OSHA-recognized third-party validation organizations for the validation of the certification of PSDI safety systems. OSHA will recognize state certification/validation if it is based on a system at least as effective as OSHA's.

For the reasons discussed, OSHA concludes that certification/validation as set forth in this standard is necessary for the safe use of PSDI. OSHA's views are reinforced by the wise range of support from press users, manufacturers, trade associations, insurance companies and a safety association.

Paragraphs (h)(11) (i), (ii), and (iii), respectively, contain the general requirements for the three levels of certification/validation. Because of the technical nature of the standard, and the dependence on the certification/validation process to ensure compliance with the standard, the certification/validation requirements are supplemented by three appendices. Appendix A provides the mandatory requirements pertinent to each provision in the section, and identifies the responsibilities of the employer, the manufacturer, and the validation organization. Appendix B provides nonmandatory guidelines which assist employers, manufacturers and others in understanding and implementing the requirements. Appendix C provides mandatory requirements for OSHA recognition of third-party validation organizations; this appendix lists the procedures for application, review, experience, terms and conditions, and provisions for OSHA recognition. OSHA believes these three appendices provide clearer delineation and understanding of the requirements.

There were no comments received to paragraph (h)(11)(ii), therefore, it remains unchanged from the proposal (50 FR 12179).

Paragraph (h)(11)(iii) received one comment from the Motor Vehicle Manufacturers Association (Ex. 18–45) that suggested a revision to read "any press whose safety system has not been certified or recertified annually should be removed from service until the safety system is recertified." This change, it was said, would help to better implement a plant safety program. OSHA has considered this suggestion and believes the wording of the provisions as published in the proposal is more effective.

Paragraphs (h)(11) (iv) and (v) received no comments.

Paragraph (h)(11)(vi) received two comments. One suggested that OSHA add language to make it plain that this is not a substitute for notification of the Secretary of Labor or the State Plan agency (Exs. 18–19 and 22). OSHA agrees, and the provision is so revised in the final rule. The other commenter requested adding the requirement to notify the manufacturer of any injury as well as the certifier so that they may be "in consultation to determine cause if one can be found" (Ex. 18–25). OSHA is including such notification to the manufacturer in the procedures to be followed by the validation organization, rather than increasing the burden on the employer to do so. The validation organization should be better able to determine which manufacturer(s) of safety system components would be involved in the event of an injury.

Section 1910.217(h)(12), "Die Setting and Work Set-Up." This paragraph addresses the requirements for die setting the work set-up on presses used in the PSDI mode. Paragraph (h)(12)(i) requires conformance with current requirements as well as with the new requirements for PSDI. Paragraph (h)(12)(ii) prohibits the use of PSDI for the actual die setting or set-up. Paragraph (h)(12)(iii) requires checks of the safety distance, supplemental safeguarding, and slide counterbalance adjustment following each die change. It also requires a special tool, available only to authorized personnel, for adjustment of the PSDI presence sensing device.

OSHA concludes these requirements are necessary in order to assure that die setting and work set-up are accomplished safely and without degrading the safety of the PSDI operations. There were no comments on this paragraph. However, in the final rule, paragraph (h)(12)(iii) is revised to refer to adjustments of the *location* of the presence sensing device. This change is necessary in order to prevent confusion with the provisions in paragraph (h)(9)(iv) which address adjustments of the *sensitivity* of the presence sensing device.

Section 1910.217(h)(13), "Operator training." This paragraph supplements the training required by the present standard by requiring additional training for the operator of a press used in the PSDI mode. OSHA recognizes the importance of operator training, and believes that the additional specific training for PSDI operation is necessary in order to ensure operator understanding and capability to perform PSDI safely. The Minster Machine Company (Ex. 18–18) commented on this requirement, pointing out the need for increased training as well as supervision because of the new PSDI requirements, and stating concern that even the present training requirements are not being regularly met or enforced. OSHA agrees that there are more rigorous training requirements needed for PSDI and has incorporated them in the standard. The provisions are enforceable.

The provisions of this final rule give emphasis to this need for more training by specifying in paragraph (h)(13) the specific additional areas where extra training is required. In addition, the certification/validation requirement, in particular, defines a mechanism for the employer to demonstrate conformance with the training requirements as well as with the broad requirements for PSDI. If an employer elects to use PSDI in conformance with this standard, the standard is explicit in defining the continuing training and various methods, practices and responsibilities to do so safely.

Further, in response to the above-mentioned public comment (Ex. 18–18) and several others (Exs. 18–2, –8 and –35) that present training requirements are not being regularly met or enforced, although OSHA does not agree that this is so, a provision is added in the final rule to require certification that employees have been trained. The minimum information required for this certification record is the identity of the trainee, the signature of the employer or the person who conducted the training, and the date the training was completed. This certification is not considered an Information Collection Burden under the terms of the Paperwork Reduction Act.

Appendix A—"Requirements for Certification/Validation of Safety Systems for Presence Sensing Device Initiation of Mechanical Power Presses." This Appendix provides the mandatory requirements for certification/validation of the safety system. The requirements attempt to provide a degree of specificity which can be utilized as a basis for demonstrating and evaluating the capability of a safety system to satisfy the requirements of the standard for safe PSDI.

The requirements from the proposal are more explicitly stated in the final rule in order to better define the relationships between the OSHA-recognized third-party validation organization and the manufacturer and employer or their representatives, for the three categories of certification/validation—design, installation, and recertification/revalidation.

For each category of certification/validation, there is a two-stage process. In simple terms, for design certification/validation, the manufacturer (which can be an employer) certifies that the PSDI safety system meets the requirements of the PSDI standard, and then the OSHA-recognized validation organization validates that certification. For installation certification/validation and recertification/revalidation, the employer certifies that the PSDI safety system meets the requirements of the PSDI standard, and then the OSHA-recognized validation organization validates that certification.

The proposal did not perhaps make the language as clear as was intended between certification by the manufacturer and employer and validation by the validation organization (called the "third-party certification program" in the proposal). The two stages together are referred to as "certification/validation." Moreover, this is the standardized nomenclature in the field. (See ANSI Z34.1–1987, American National Standard for Certification—Third Party Certification Program; Department of Housing and Urban Development (HUD) Administrator Qualifications and Procedures for HUD Building Products Certification Programs; Final Rule, September 20, 1979 (44 FR 54656); and Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Safety Testing or Certification of Certain Workplace Equipment and Materials, Proposed Rulemaking of March 6, 1984 (49 FR 8343).)

This clarification may answer some of the criticism such as by NEMA that OSHA was not fully indicating the design responsibility of the manufacturer. This clarification of language appropriately affirms the primary design and certification responsibility of the manufacturer.

As part of the simplification process, the final version of Appendix A eliminates several paragraphs which cross reference several requirements in other subparagraphs of 29 CFR 1910.217 (a)–(h). Since the cross references were basically to the whole standard, there was essentially no assistance by the cross references to the public and the lists were confusing. However, the elimination of the cross references is not intended to eliminate any existing requirements of 29 CFR 1910.217 (a)–(h).

Many of the comments on Appendix A were the same as those stated on paragraph (h)(11). There were 12 general comments on the Purpose, Scope, and Summary of Appendix A (Exs. 18–66,

–25, –26, –45, –40, –51, –56, –57, –64, –71, –79 and –83). Four of these comments stated that the language should be written more simply (Exs. 18–40, –51, –57, and –83). As an example of these, one commenter stated "I am in favor of the certification and annual recertification. Specifications shuld be written in performance-based language, making use of standards such as those already established in European countries that have years of demonstrated safe history" (Ex. 18–83). Three comments from Sick-Optik-Electroniks (Ex. 18–56, –57, and –78) suggested that all specifications be deleted and left to the third-party certification/validation agency for development. OSHA recognizes and endorses the benefits of using performance language wherever possible in workplace safety standards. A number of revisions are being made in the final rule Appendix in order to better organize the certification/validation requirements and to make them shorter, simpler and more performance-oriented. Some specificity is necessarily retained, however, in order to ensure understanding and effective implementation of the certification/validation function.

AMSA (Ex. 18–64) suggested that the language of the Summary be changed to eliminate the words "* * * shall be performed in a sequential manner and * * *" in order to simplify the certification process and allow flexibility in meeting the requirements. OSHA agrees, and the change is incorporated into the final rule.

In the Summary, paragraph C, reference is made to recertification/revalidation requirements when operational conditions are changed. The American Metal Stamping Association (Ex. 18–64) suggested that "It should be made clear that this does not apply to die changes (application), location of the press where disassembly of the safety system isn't required to move the press (facility changes), or other changes of this nature." OSHA agrees that recertification/revalidation should not be necessary under such conditions, and an appropriate exception is added in the final rule.

Other paragraphs in Appendix A address more specific details of certification/validation. For example, where reference is made to "single human error" in new paragraph A.2., Certification/Validation Program Level of Risk Evaluation Requirements, it was noted by two commenters (Exs. 18–31 and –64) that it should be changed to read "single operator error." As was previously mentioned for §§ 1910.211(d)(62) and 1910.217(h)(8)(i), OSHA agrees, and the change is included in the final rule.

ISB Products Incorporated (Ex. 18–37) stated, regarding this same paragraph, "Redundancy is not enough for a safety system. It should be fail-safe for any single component failure. If the system is safe for a single component failure, then component life specifications are not needed." OSHA agrees that redundancy, per se, is not necessarily an acceptable alternative to the requirement that no single failure point may cause injury. However, the provision considers redundancy as an acceptable, although less preferable, alternative when comparison and/or diagnostic checking is combined in order to ensure continued operating capability of both the primary and the redundant items.

The American Metal Stamping Association (Ex. 18–64) pointed out the desirability for a power press builder or other agent to offer a fully equipped press package that is "design certified" for PSDI operations, which would encourage development of a product line of new PSDI presses and would reduce the cost of design certification by spreading it over a large base of machines. OSHA agrees, and the manufacturer's design certification provisions have been so revised in paragraph A.3., New Design Certification/Validation, in the final rule.

That same commenter also suggested that manufacturers of subsystems should be able to obtain design certification/validation for their subsystems independent of the rest of the subsystems needed in a PSDI system. OSHA agrees that this could enhance flexibility in integrating different subsystems into the safety system, but it would not provide employers with the assurances which certification/validation of the *total* safety system would provide. At this time, OSHA is retaining in the final rule the certification/validation requirements for the safety system in its entirety, with provisions for acceptance of subsystems which are determined by the certification/validation program to be equivalent through similarity analysis. If and when future developments permit equipment sophistication or standardization sufficient for interchangeability, this requirement will be re-evaluated.

There were nine responses to the Manufacturer's Certification Requirements, paragraph D(1)(a)(1) in the proposal, which refer to the definition of "full stop" (Exs. 18–39, –40, –44, –57, –58, –64, –66, –77, –80). All of the comments criticized the wording of the paragraph.

ELKAY Manufacturing Company (Ex. 18–39) was opposed on the basis that the definition of full stop should not be based on deceleration, and it would be difficult to measure the indicated criteria in the average shop. Although that commenter was opposed to a definition based on some low crank speed, other commenters (Exs. 18–40, –44, –57, –64, –77) suggested that the measurement be taken from the crankshaft and not the slide. It was recommended that the rotation of the crankshaft at a low number of revolutions per minute (RPM), such as one or two RPM, be used for the definition of "full stop." As previously stated in comments on paragraph (h)(2) of the standard, OSHA agrees that a more feasible definition of "full stop" is when the crankshaft rotation has slowed to two revolutions per minute, just before stopping completely. Appendix A is so revised in the final rule (new paragraph B.2., Definitions).

The test instrument accuracy requirement for measurement of reaction times to be accurate within 0.0001 seconds was viewed as being too strict by one commenter (Ex. 18–51) who stated that "* * * an instrument accuracy within 0.0001 seconds (Appendix A) seems to be overly restrictive by a whole order of magnitude, with no stated justification for such accuracy." OSHA has considered the comment, noting that an error in a time measurement of 1.0 milliseconds at a hand speed of 63 inches per second (1.6 m/s) equates to a distance of only 0.063 inches in the safety distance calculation, and concurs that the accuracy requirement may be relaxed to 0.001 seconds. In the final rule (new paragraph B.2.), the requirement is so revised.

The majority of the comments received on Appendix A were in reference to paragraph D(2) of the proposal, which involves brake tests. There were 16 comments received, most of which suggested that this paragraph should be deleted (Exs. 18–32, –37, –44, –52, –61, –62 and –79) or changed (Exs. 18–15, –17, –24, –25, –26 and –39). The objections to this paragraph expressed the concern that the requirements was not realistic or meaningful to simulate brake wear by grinding the brake lining. It was suggested instead that visual inspections be required of the brakes.

OSHA believes that considerations of brake wear are valid concerns in the tests defined in paragraph (h)(2)(ii) to determine if the brake system qualifies for high torque capability. Since grinding

of the brake lining to simulate wear may not be realistic and may present other disadvantages, OSHA will accept the manufacturer's recommendations for estimating or simulating brake wear in the stopping time tests to determine torque sufficiency and to meet design certification/validation requirements.

With regard to installation certification/validation and annual recertification/revalidation, however, OSHA believes the stopping time tests should reflect the brake system conditions as they exist at that time. Brakes which are the adjustable type would need to be adjusted properly before the test, and brake wear would not be a factor, other than to evaluate the expectation that the manufacturer's minimum lining depth would not be exceeded before the next annual recertification. Stopping time tests in compliance with paragraph (h)(5)(iii) and (h)(9)(v) would be in this category. Accordingly, Appendix A is so revised in the final rule (new paragraphs B.3. and B.4.).

There were four comments received on proposed paragraph D(4) of the Appendix, which contains the requirements for spring testing. These responses were similar to those received for brake tests, recommending deletion of the test and promoting the use of visual tests and reliance on the brake monitor to ensure stopping time integrity (Exs. 18–39, –46, –58, –64 and –80). One of these commenters, AMSA (Ex. 18–64), stated:

> Simulated tests with one broken spring should be deleted. The standard requires non-interlocking springs and mounting on a rod or in a tube, etc. AMSA has recommended a visual check be conducted of springs prior to the stopping tests in paragraphs (h)(2)(ii) and (h)(5)(iii). Further, a brake monitor is required for PSDI. Its function is to shut down the system if brake performance degrades regardless of cause. A single broken spring is unlikely to cause a catastrophic failure of a brake. Therefore, the brake monitor is capable of addressing this concern.

OSHA agrees. Since the impact of a broken spring on safety is the increase of stopping time, the requirement in the proposal to simulate a broken spring and to evaluate the test on the basis of the torque developed is deleted in the final rule. In its place, Appendix A (new paragraph B.5.) includes provisions for visual checks of the springs prior to stopping time tests, with investigation of the springs as a possible cause of excessive stopping times beyond the brake monitor setting limits defined in paragraph (h)(5)(iii).

One comment was received in reference to paragraph D(1)(a)(7) in the proposal which details the requirements for a hand tool device and object sensitivity. AMSA stated that: "This paragraph should be deleted. The requirement of paragraph (h)(9)(x) is straightforward and not in need of further tests or specifications." OSHA believes that the tests are necessary to determine that the proper hand tool diameters have allowed for variations in minimum object sensitivity response. There is no change in this provision (new paragraph B.8.) in the final rule.

AMSA also addressed proposed paragraph D(1)(b) on Integrated Tests Certification which stated: "Determination that requirements of paragraph (h)(6) are met can be based on analysis, such as failure mode analysis, and/on tests. There should be no absolute requirements for integrated tests if less expensive analysis can provide necessary assurances" (Ex. 18–64). OSHA has carefully reviewed this comment and believes these tests are necessary to assure that the requirements of paragraph (h)(6) have been met. This provision remains unchanged in the final rule (new paragraph B.9.).

Proposed paragraph D(1)(c), Analysis, received one comment referencing failure mode and effect analysis. Peter N. Bosch (Ex. 18–25) stated that "much of the data required for certification, such as failure mode effect analysis, is not available for current press designs, much less for older presses that may be candidates for retrofit." OSHA believes that the data required for these tests can be made available by the manufacturer by using the development tests and the design engineer's experience and knowledge of press components and integrated systems. This provision is retained as new paragraph B.10. in the final rule.

Section E of the proposed Appendix A was concerned with the types of tests acceptable for certification. One response was received to this section which stated "The description of the types of test acceptable for certification seems overly specific. A simple statement that the manufacturer and certification agency shall agree on appropriate tests could be just as effective" (Ex. 18–64). OSHA is of the opinion that guidelines for testing are important to assure that the test methods will be appropriate for providing maximum safety of the components and the entire system. The provision is retained as new paragraph B.11. in the final rule.

Appendix B—"Guidelines for Certification/Validation of Safety Systems for Presence Sensing Device Initiation of Mechanical Power Presses." This Appendix provides nonmandatory guidelines to assist employers, manufacturers, and their representatives in accomplishing the certification process. It supplements the provisions of the standard and the mandatory requirements in Appendix A.

Three comments were received on Appendix B. Exhibit 18–64 stated that "* * * the certification process should be kept as simple and cost-effective as possible." OSHA has attempted to do this and has reviewed and incorporated as many comments that suggested methods to accomplish this goal without sacrificing the safety of the operator while using PSDI.

Two comments from the State of Maryland (Exs. 18–19 and –22) were received on Section F that support deletion of this guideline because: "There is no way that a 'data base' of any kind can be accumulated during a certification program." OSHA believes that the experience with the testing procedures of the certification/validation program will enable those participants to accumulate data based on the results of the various test methods. However, the purpose of Appendix B is not to create a data base, but to give nonmandatory guidance for an effective certification/validation program.

Appendix C—"OSHA Recognition of Third-Party Validation Organizations for the PSDI Standard." This Appendix provides mandatory requirements for OSHA recognition of PSDI-related third-party validation organizations. The proposal discussed OSHA recognition of third-party certification programs (50 FR 12703, 12707, 12712–3). It referred to and incorporated into the PSDI record an earlier OSHA proposal covering OSHA recognition of third-party certification programs generally (Ex. 17, 49 FR 8326, March 6, 1984). OSHA specifically referenced in the PSDI proposal Subparts A, C, D, and I of the proposed Part 1936.

However, the proposal stated that the general approach to OSHA recognition (proposed Part 1936) may not be finalized by the time OSHA had completed work on a final PSDI standard. Therefore, OSHA requested comment on whether an interim approach to OSHA recognition should be incorporated into the PSDI standard to prevent delay in issuing a final PSDI standard. OSHA also expressed an interest in receiving comments on possibly simplifying the process.

Many comments supported OSHA's suggestion that an interim procedure for OSHA recognition of third-party organizations be adopted for PSDI if a

final general procedure had not been adopted by that time. (See the AMSA comment above Ex. 18–64 and Exs. 18–15, –17, –24, etc.)

There was also some general support for simplification from Stampmatic (Ex. 18–46) and Sick-Optik-Electronik (Ex. 18–56). AMSA (Ex. 18–64) commented:

> As an advocate of certification, AMSA is concerned that rulemaking not establish a certification process that is so cumbersome it cannot function. Nothing could destroy incentive to utilize proven, productive, safety-improving technology faster than an inordinately cumbersome series of administrative procedures and/or certification processes.
>
> The type of certification that is needed for PSDI is relatively straightforward. Technically competent people—who are scrupulously unbiased—must review diagrams, tests, failure mode analyses, performance benchmarks, etc., to determine that elements of the safety system are designed, manufactured, integrated, installed and maintained in conformance with requirements of the proposed new paragraph (h). Conflicts of interest must be avoided. And the benefits of "third-party" certification, as opposed to self-certification, are obvious.

There was little or no opposition to simplification. However, there were few specific suggestions on how to simplify the OSHA recognition process. Several suggested that OSHA directly appoint a specific third-party organization. But as discussed above, that does not appear to be appropriate. However, in one significant change in this final rule, the term "validation organization" is used, rather than "certification program," in order to enhance clarity and understanding.

OSHA, to prevent delay, has incorporated a recognition process for PSDI validation organizations because a general recognition process (proposed Part 1936) has not yet been adopted by OSHA. The PSDI certification/validation process is now based only on the proposed Subparts C and D of proposed Part 1936. However, OSHA has substantially simplified the recognition process as set forth in section I of Appendix C from that which was originally proposed for Part 1936.

The reason OSHA has simplified its Part 1936 proposal is that OSHA recognition of third-party validation organizations for PSDI is obviously a much more limited universe than OSHA recognition of programs for a wide variety of different equipment. Secondly, the simplification should make the recognition process take less time. Thirdly, in light of the fairly explicit requirements oif the PSDI standard and Appendix A, it does not appear necessary for OSHA to get involved in the detailed operation of the validation organization. Therefore, for example, provisions have not been included on the validation organization's records management operation, its employee training practices and its security arrangements. A competent third-party validation organization is capable of handling questions like those itself.

Nevertheless, this action is not intended to set any precedents; final decisions on the 1984 proposal will be based on the record of that proposal.

As mentioned, section I of Appendix C of this final rule states procedures for OSHA recognition. An application must be filed and after investigation a preliminary decision is made. Notification of the preliminary decision is published in the **Federal Register**. Public comment is provided for and, if appropriate, a hearing. The final decision on recognition is based on the evidence in the record. Procedures are provided for renewal or expansion of recognition if the program is performing in a satisfactory manner. There is also a provision for withdrawal of recognition if performance is unsatisfactory.

The OSHA recognition provisions are directed towards having third-party validation organization demonstrate to OSHA that they are competent to handle PSDI certification/validation. Accordingly, section II of Appendix C states reasonable qualifications for experience in relevant areas such as press design, test selection and testing. It sets requirements for qualifications of the senior employees of the program and availability of adequate testing equipment. Certain requirements of independence from possible pressure from equipment manufacturers and press users are stated. In addition, the program must be legally authorized to validate certifications, and have a certification/validation mark which can be protected from improper use.

Section III of Appendix C sets certain reasonable requirements for the certification/validation program's procedures. These cover certification and validation procedures, test and certification/validation reports, making available a list of certified/validated systems, follow-up activities and a disputes resolution procedure.

OSHA concludes that the procedures for recognition meet the requirements of law, are fair and are reasonable for determining the competency of the validation organization without excessive delay. OSHA concludes that the provisions for validation organization competency and certification/validation procedures are reasonable for certifying/validating PSDI safety systems. The provisions are based on proposed Part 1936, but with changes to appropriately simplify them and make them responsive to certifying/validating PSDI safety systems. The changes meet the general tenor of comments in the PSDI record and no comments in the PSDI record gave specific comments contradicting this approach to OSHA recognition. (As discussed above, there were criticisms of third-party certification.) As stated before, OSHA does not intend that this approach for PSDI set precedents for other areas.

It should be stated that OSHA's approach to certification/validation of PSDI safety system and recognition of third-party validation organizations is similar to a system which has been utilized successfully by the Department of Housing and Urban Development (HUD) for over six years in its program for certification of building products. Under the program, organizations acceptable to HUD validate manufacturers' certifications that certain building materials or products meet applicable standards. It has been demonstrated that the system works effectively to ensure satisfactory building materials or products, and it is also claimed that liability exposures on the part of both the manufacturer and the validator have been greatly reduced.

Appendix D—"Supplementary Information." This Appendix provides supplementary nonmandatory information to assist in the understanding of paragraph (h) of this section.

One comment was received to Appendix D. ELKAY Manufacturing Association (Ex. 18–39) included comments regarding brake torque tests, which are discussed above in the portion regarding paragraph (h)(2)(ii). As stated there, no changes are made in the discussion of this provision in Appendix D. However, there are other changes in this Appendix. There is additional discussion under 6. *Cycle control and control systems* on the following topics: Extending the PSDI deactivation timer adjustable limit from 15 to 30 seconds; recommending that the presence sensing device on a press equipped for PSDI operation be used as a guarding device in other than the PSDI mode; describing an acceptable method for interlocking supplemental guards; and explaining the prohibition against die-setting in the PSDI mode and against production in the "inch" mode. In addition, a typographical correction is made in 9. *Safeguarding the point of operation.* These changes have all been discussed in their respective portions of this

Summary and Explanation of the Final Rule..

IV. Termination of Experimental Variance

As a result of the implementation of this final rule, OSHA will terminate the experimental variance which was granted to the Interlake Stamping Company (now Interlake Stamping of Ohio, Inc.), to permit presence sensing device initiation on selected mechanical power presses. The effective date of the termination will be left open in order to allow a reasonable time for certification of the PSDI safety systems at Interlake after the establishment of a certification/validation program. This will be the only formal announcement of the termination of the variance.

OSHA wishes to recognize and express appreciation for the contribution which has been made by Mr. Wayne E. Groenstein, President, and the employees of Interlake in initiating and carrying out the experimental variance. Their successful safe implementation of presence sensing device initiation was a significant factor in OSHA's evaluation and decision to enter into a rulemaking action to permit its use.

V. Summary of the Regulatory Impact Analysis and Regulatory Flexibility Assessment

Executive Order 12291 (46 FR 13197, February 19, 1981) requires that a Regulatory Impact Analysis (RIA) be performed for any rule having major economic consequences on the national economy, individual industries, geographical regions, or levels of government. The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) similarly requires the Occupational Safety and Health Administration (OSHA) to consider the impact of the proposed regulation on small entities.

Consistent with these requirements, OSHA has prepared a Regulatory Impact Analysis and Regulatory Flexibility Assessment for the revisions to the OSHA standard governing mechanical power presses. These revisions amend the present standard for mechanical power presses (29 CFR 1910.217) to allow employers to voluntarily adopt presence sensing device initiation (PSDI) on mechanical power presses. OSHA's present standard does not permit presence sensing device initiation. Rather, it requires that a mechanical power press operator physically initiate the stroke of a power press by using hand controls or a foot pedal. This revision will allow, but not require, a presence sensing device to initiate the mechanical stroke automatically when the operator's body is out of the danger zone. The amended standard's provisions cover not only the use of presence sensing devices, but also the entire safety system of the presses that will use these devices.

This RIA describes the industries and workers affected by the standard, the current use of and productivity gains associated with PSDI technology, the costs of compliance with the standard, the expected level of use of PSDI by U.S. industry, and the net savings to the United States from PSDI technology. The primary data source used to prepare this RIA is "A Study of the Proposed Revisions to the OSHA Standard Governing Mechanical Power Pressess" (29 CFR 1910.217) (Ex. 23), which was prepared by Eastern Research Group (ERG) for OSHA in February 1984.

The standard affects mechanical power presses, a type of equipment widely used in various metalworking and other industries. In particular, these machines are extensively used in Fabricated Metal Products (SIC 34), Machinery, Excluding Electrical (SIC 35), and Electrical and Electronic Equipment (SIC 36). The impact of this revision is greater upon Metal Forgings and Stampings (SIC 346), the industry that makes the most intensive use of mechanical power presses. Within SIC 346, Automative Stampings (3465), Crowns and Closures (3466), and Metal Stampings, Not Elsewhere Classified (3469) are the primary users of mechanical power presses. A variety of industries outside the metalworking industries will also be affected by the regulation. Thirteen percent of all machine tools (a category of equipment that includes mechanical power presses) are used in industries other than metalworking industries.

Impact of the Standard

Worker Population

There are about 73,000 employees who will be affected by the standard. Two occupational groups, "punch and stamping press operators" and "job and die setters," contain nearly all the employees now operating the manually fed presses that could be converted to PSDI technology. There are 96,000 employees in the former occupational group and 74,000 in the latter. This total of 170,000 employees includes both operators of non-mechanical presses as well as die setters who do not manually feed the presses. OSHA has estimated that about 60 percent of the first occupational group and 20 percent of the second occupational group work on manually fed power presses. Thus, about 73,000 workers (58,000 "press operatives" and 15,000 "job and die setters) could be affected by the standard.

Technological Feasibility

OSHA is required to assess the technological feasibility of new regulations prior to their promulgation. This standard removes OSHA's prohibition against the use of PSDI on mechanical power presses, but does not require the use of this technology. Under a 1976 OSHA-granted variance, one U.S. metal stamping firm has utilized PSDI technology in a manner consonant with the operational requirements of the standard. This technology has been utilized in Europe for over 30 years. A significant portion of the manually fed mechanical power presses are capable of being retrofitted with PSDI technology. Thus, the safety equipment and work practices contained in the proposed OSHA standard have been demonstrated to be technologically feasible.

Savings and Costs

The current regulatory environment prohibits the use of PSDI on mechanical power presses. OSHA has estimated that allowing employers to convert existing presses to PSDI systems will increase the productivity of each press converted by an average of 24.3 percent. This gain implies that the addition of PSDI technology to an existing press will, on average, annually release about $8,160 worth of resources to the U.S. economy. Multiplying this figure by OSHA's projection of 19,875 conversions of existing mechanical presses indicates that by 1990 this standard would save about $162 million per year.

The net annualized savings to the U.S. economy from the conversion of existing presses to PSDI is the excess of the savings over the cost of these conversions. The cost of these conversions includes: (1) The cost of converting the existing equipment to PSDI technology; (2) the cost of certifying and validating the PSDI safety system; (3) the cost of inspecting and maintaining the PSDI systems; and (4) the cost of training workers. OSHA has estimated these annualized costs at between $49 and $77 million by 1991. Therefore, the estimated net annualized savings from the conversion of existing presses to PSDI is between $85 and $113 million.

OSHA has also estimated that 250 new presses per year will utilize PSDI for an annual productivity increase of $2.04 million. By 1996, after an estimated 2,500 new presses are equipped with PSDI systems, their total annualized

costs will be between $4.1 and $5.5 million and their total annualized savings will be $20.4 million, resulting in a new annualized savings of $14.9 to $16.3 million for new presses. The combined annualized savings from existing and new presses by 1996 is expected to be between $99.8 and $129.1 million.

Economic Feasibility

As stated, there is no requirement for a press owner to convert to this new technology. If the press owner converts, the annual savings from increased productivity are more than twice the annualized costs of the conversion. Consequently, the amended standard is clearly economically feasible.

Impacts on Small Firms

Pursuant to the Regulatory Flexibility Act of 1980 (Pub. L. 96–353, 94 Stat. 1164 (5 U.S.C. 601 *et seq.*)), OSHA is required to consider the impact of the new regulation on small entities. As a result of this review, the Assistant Secretary certifies that the standard would not have an adverse impact upon a significant number of small entities.

The standard will not have any differential adverse impact on small firms. In fact, small firms may have a relatively greater cost savings than those in larger firms because in the affected industries small firms tend to be newer than large firms. Newer firms tend to have newer presses and as the required investment for retrofitting presses with presence sensing devices usually increases with the age of the equipment, newer firms will incur relatively lower costs than those incurred by older firms.

These relative cost savings may be offset to some extent, however, because a large firm would be able to distribute the overhead costs associated with equipment certification and validation and employee training among more presses than would a small firm. In addition, the relative productivity gain may be smaller for new presses.

International Trade Impacts

Pursuant to Executive Order 12291, OSHA has considered the impact of this standard on the U.S. trade balance. The promulgation of the standard may have a positive impact on the U.S. trade balance for fabricated metal products.

Foreign competition in both U.S. manufacturing and finished products markets has contributed to the recent decreased demand for U.S. contract stamping services. The increase in productivity associated with the use of PSDI systems should improve the competitive position of U.S. parts and equipment manufacturers. These gains should reduce the production costs for certain final products of U.S. manufacturers.

VI. Environmental Impact Assessment—Finding of No Significant Impact

This proposed rule and its major alternatives have been reviewed in accordance with the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 *et seq.*), the Guidelines of the Council on Environmental Quality (CEQ) (40 CFR Part 1500), and OSHA's DOL NEPA Compliance regulations (29 CFR Part 11). As a result of this review, the Assistant Secretary for OSHA has determined that the proposed rule will have no significant environmental impact and that the revisions are categorized as excluded actions according to Subpart B, § 11.10 of the DOL NEPA Compliance regulations.

The proposed revisions to 29 CFR 1910.217 would allow the use of presence sensing devices to initiate the stroke of mechanically powered presses after the operator is out of the danger zone. The provisions of the proposal focus on reducing accidents or injuries by the proper use and handling of equipment, by means of work practices and procedures, by certification of equipment, by worker training, as well as by changes in language, definition, and format of the standard. These revisions do not impact on air, water, or soil quality, plant or animal life, the use of land, or other aspects of the environment.

VII. Paperwork Reduction Act

The recordkeeping requirements in this standard have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.* The approval number is 1218–0143 and the approval has been granted until February 29, 1991.

VIII. State Plan Applicability

The 23 States and two territories with their own OSHA-approved occupational safety and health plans must adopt a comparable standard within 6 months of this publication date. These are: Alaska, Arizona, California (for State and local government employees only), Connecticut (for state and local government employees only), Hawaii, Indiana, Iowa, Kentucky, Maryland, Michigan, Minnesota, Nevada, New Mexico, New York (for state and local government employees only), North Carolina, Oregon, Puerto Rico, South Carolina, Tennessee, Utah, Vermont, Virginia, Virgin Islands, Washington, and Wyoming. Until such time as a State standard is promulgated, Federal OSHA will provide interim enforcement assistance, as appropriate, in these States.

IX. Effective Date

The provision for OSHA recognition of third-party validation organizations set forth in Appendix C becomes effective 30 days after date of publication in the **Federal Register**. The other provisions of this standard become effective the later of 90 days after publication in the **Federal Register** or the date of OSHA recognition of a third-party validation organization. As certification/validation is a requirement, PSDI cannot be implemented unit such time as a validation organization has been recognized. A **Federal Register** notice will be published when a third-party validation organization has been recognized by OSHA.

X. Authority

This document was prepared under the direction of John A. Pendergrass, Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, 200 Constitution Ave., NW., Washington DC 20210.

List of Subjects in 29 CFR Part 1910

Certification, Light curtains, Mechanical power presses, Occupational safety and health, Presence sensing device initiation, Safety, Training, Validation.

Accordingly, pursuant to sections 4, 6(b), 8(c) and 8(g) of the Occupational Safety and Health Act of 1970 (84 Stat. 1593, 1599, 1600; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 9–83 (48 FR 35736), and 29 CFR Part 1911, OSHA is amending § 1910.211, § 1910.217 and the authority citation for Subpart O of 29 CFR Part 1910 as set forth below.

Signed at Washington, DC, this 7th day of March 1988.

John A. Pendergrass,

Assistant Secretary of Labor.

PART 1910—[AMENDED]

1. The authority citation for Subpart O of Part 1910 is revised to read as follows:

Authority: Secs. 4, 6, 8, Occupational Safety and Health Act of 1970 (29 U.S.C. 653, 655, 657); Secretary of Labor's Order No. 12–71 (36 FR 8754), 8–76 (41 FR 25059) or 9–83 (48 FR 35736), as applicable. Sections 1910.211 and 1910.217 also issued under 29 CFR Part 1911.

2. Section 1910.211 is hereby amended by revising paragraph (d)(12) and (d)(11)(iii), by removing the period and adding ", or" at the end of paragraph

(d)(11)(iii), and by adding new paragraphs (d)(11)(iv), (d)(61), (d)(62), (d)(63), (d)(64), (d)(65), and (d)(66) to read as follows:

§ 1910.211 Definitions.

* * * * *

(d) * * *

(11) * * *

(iii) Automatically withdraws the operator's hands if the operator's hands are inadvertently within the point of operation as the dies close, or

(iv) Prevents the initiation of a stroke, or stops of stroke in progress, when there is an intrusion through the sensing field by any part of the operator's body or by any other object.

(12) "Presence sensing device" means a device designed, constructed and arranged to create a sensing field or area that signals the clutch/brake control to deactivate the clutch and activate the brake of the press when any part of the operator's body or a hand tool is within such field or area.

* * * *

(61) "Presence sensing device initiation" means an operating mode of indirect manual initiation of a single stroke by a presence sensing device when it senses that work motions of the operator, related to feeding and/or removing parts, are completed and all parts of the operator's body or hand tools are safely clear of the point of operation.

(62) "Safety system" means the integrated total system, including the pertinent elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator, and the environment, designed, constructed and arranged to operate together as a unit, such that a single failure or single operating error will not cause injury to personnel due to point of operation hazards.

(63) "Authorized person" means one to whom the authority and responsibility to perform a specific assignment has been given by the employer.

(64) "Certification" or "certify" means, in the case of design certification/validation, that the manufacturer has reviewed and tested the design and manufacture, and in the case of installation certification/validation and annual recertification/revalidation, that the employer has reviewed and tested the installation, and concludes in both cases that the requirements of § 1910.217 (a) through (h) and Appendix A have been met. The certifications are made to the validation organization.

(65) "Validation" or "validate" means for PSDI safety systems that an OSHA recognized third-party validation organization:

(i) For design certification/validation has reviewed the manufacturer's certification that the PSDI safety system meets the requirements of § 1910.217 (a) through (h) and Appendix A and the underlying tests and analyses performed by the manufacturer, has performed additional tests and analyses which may be required by § 1910.217 (a) through (h) and Appendix A, and concludes that the requirements of § 1910.217 (a) through (h) and Appendix A have been met; and

(ii) For installation certification/validation and annual recertification/revalidation has reviewed the employer's certification that the PSDI safety system meets the requirements of § 1910.217 (a) through (h) and Appendix A and the underlying tests performed by the employer, has performed additional tests and analyses which may be required by § 1910.217 (a) through (h) and Appendix A, and concludes that the requirements of § 1910.217 (a) through (h) and Appendix A have been met.

(66) "Certification/validation" and "certify/validate" means the combined process of certification and validation.

3. Section 1910.217 is hereby amended by revising paragraph (c)(3)(iii)(*b*) and by adding a new paragraph (h), to read as follows:

§ 1910.217 Mechanical power presses.

* * * * *

(c) * * *

(3) * * *

(iii) * * *

(*b*) The device may not be used as a tripping means to initiate slide motion, except when used in total conformance with paragraph (h) of this section.

* * * * *

(h) *Presence sensing device initiation (PSDI)*—(1) *General.* (i) The requirements of paragraph (h) shall apply to all part revolution mechanical power presses used in the PSDI mode of operation.

(ii) The relevant requirements of paragraphs (a) through (g) of this section also shall apply to all presses used in the PSDI mode of operation, whether or not cross referenced in this paragraph (h). Such cross-referencing of specific requirements from paragraphs (a) through (g) of this section is intended only to enhance convenience and understanding in relating to the new provisions to the existing standard, and is not to be construed as limiting the applicability of other provisions in paragraphs (a) through (g) of this section.

(iii) Full revolution mechanical power presses shall not be used in the PSDI mode of operation.

(iv) Mechanical power presses with a configuration which would allow a person to enter, pass through, and become clear of the sensing field into the hazardous portion of the press shall not be used in the PSDI mode of operation.

(v) The PSDI mode of operation shall be used only for normal production operations. Die-setting and maintenance procedures shall comply with paragraphs (a) through (g) of this section, and shall not be done in the PSDI mode.

(2) *Brake and clutch requirements.* (i) Presses with flexible steel band brakes or with mechanical linkage actuated brakes or clutches shall not be used in the PSDI mode.

(ii) Brake systems on presses used in the PSDI mode shall have sufficient torque so that each average value of stopping times (Ts) for stops initiated at approximately 45 degrees, 60 degrees, and 90 degrees, respectively, of crankshaft angular position, shall not be more than 125 percent of the average value of the stopping time at the top crankshaft position. Compliance with this requirement shall be determined by using the heaviest upper die to be used on the press, and operating at the fastest press speed if there is speed selection.

(iii) Where brake engagement and clutch release is effected by spring action, such spring(s) shall operate in compression on a rod or within a hole or tube, and shall be of non-interleaving design.

(3) *Pneumatic systems.* (i) Air valve and air pressure supply/control.

(A) The requirements of paragraphs (b)(7)(xiii), (b)(7)(xiv), (b)(10), (b)(12) and (c)(5)(iii) of this section apply to the pneumatic systems of machines used in the PSDI mode.

(B) The air supply for pneumatic clutch/brake control valves shall incorporate a filter, an air regulator, and, when necessary for proper operation, a lubricator.

(C) The air pressure supply for clutch/brake valves on machines used in the PSDI mode shall be regulated to pressures less than or equal to the air pressure used when making the stop time measurements required by paragraph (h)(2)(ii) of this section.

(ii) Air counterbalance systems.

(A) Where presses that have slide counterbalance systems are used in the PSDI mode, the counterbalance system shall also meet the requirements of paragraph (b)(9) of this section.

(B) Counterbalances shall be adjusted in accordance with the press manufacturer's recommendations to assure correct counterbalancing of the slide attachment (upper die) weight for all operations performed on presses

used in the PSDI mode. The adjustments shall be made before performing the stopping time measurements required by paragraphs (h)(2)(ii), (h)(5)(iii), and (h)(9)(v) of this section.

(4) *Flywheels and bearings.* Presses whose designs incorporate flywheels running on journals on the crankshaft or back shaft, or bull gears running on journals mounted on the crankshaft, shall be inspected, lubricated, and maintained as provided in paragraph (h)(10) of this section to reduce the possibility of unintended and uncontrolled press strokes caused by bearing seizure.

(5) *Brake monitoring.* (i) Presses operated in the PSDI mode shall be equipped with a brake monitor that meets the requirements of paragraphs (b)(13) and (b)(14) of this section. In addition, the brake monitor shall be adjusted during installation certification to prevent successive stroking of the press if increases in stopping time cause an increase in the safety distance above that required by paragraph (h)(9)(v) of this section.

(ii) Once the PSDI safety system has been certified/validated, adjustment of the brake monitor shall not be done without prior approval of the validation organization for both the brake monitor adjustment and the corresponding adjustment of the safety distance. The validation organization shall in its installation validation, state that in what circumstances, if any, the employer has advance approval for adjustment, when prior oral approval is appropriate and when prior approval must be in writing. The adjustment shall be done under the supervision of an authorized person whose qualifications include knowledge of safety distance requirements and experience with the brake system and its adjustment. When brake wear or other factors extend press stopping time beyond the limit permitted by the brake monitor, adjustment, repair, or maintenance shall be performed on the brake or other press system element that extends the stopping time.

(iii) The brake monitor setting shall allow an increase of no more than 10 percent of the longest stopping time for the press, or 10 milliseconds, whichever is longer, measured at the top of the stroke.

(6) *Cycle control and control systems.* (i) The control system on presses used in the PSDI mode shall meet the applicable requirements of paragraphs (b)(7), (b)(8), (b)(13), and (c)(5) of this section.

(ii) The control system shall incorporate a means of dynamically monitoring for decoupling of the rotary position indicating mechanism drive from the crankshaft. This monitor shall stop slide motion and prevent successive press strokes if decoupling occurs, or if the monitor itself fails.

(iii) The mode selection means of paragraph (b)(7)(iii) of this section shall have at least one position for selection of the PSDI mode. Where more than one interruption of the light sensing field is used in the initiation of a stroke, either the mode selection means must have one position for each function, or a separate selection means shall be provided which becomes operable when the PSDI mode is selected. Selection of PSDI mode and the number of interruptions/withdrawals of the light sensing field required to initiate a press cycle shall be by means capable of supervision by the employer.

(iv) A PSDI set-up/reset means shall be provided which requires an overt action by the operator, in addition to PSDI mode selection, before operation of the press by means of PSDI can be started.

(v) An indicator visible to the operator and readily seen by the employer shall be provided which shall clearly indicate that the system is set-up for cycling in the PSDI mode.

(vi) The control system shall incorporate a timer to deactivate PSDI when the press does not stroke within the period of time set by the timer. The timer shall be manually adjustable, to a maximum time of 30 seconds. For any timer setting greater than 15 seconds, the adjustment shall be made by the use of a special tool available only to authorized persons. Following a deactivation of PSDI by the timer, the system shall make it necessary to reset the set-up/reset means in order to reactivate the PSDI mode.

(vii) Reactivation of PSDI operation following deactivation of the PSDI mode from any other cause, such as activation of the red color stop control required by paragraph (b)(7)(ii) of this section, interruption of the presence sensing field, opening of an interlock, or reselection of the number of sensing field interruptions/withdrawals required to cycle the press, shall require resetting of the set-up/reset means.

(viii) The control system shall incorporate an automatic means to prevent initiation or continued operation in the PSDI mode unless the press drive motor is energized in the forward direction of crankshaft rotation.

(ix) The control design shall preclude any movement of the slide caused by operation of power on, power off, or selector switches, or from checks for proper operations as required by paragraph (h)(6)(xiv) of this section.

(x) All components and subsystems of the control system shall be designed to operate together to provide total control system compliance with the requirements of this section.

(xi) Where there is more than one operator of a press used for PSDI, each operator shall be protected by a separate, independently functioning, presence sensing device. The control system shall require that each sensing field be interrupted the selected number of times prior to initiating a stroke. Further, each operator shall be provided with a set-up/reset means that meets the requirements of paragraph (h)(6) of this section, and which must be actuated to initiate operation of the press in the PSDI mode.

(xii) [*Reserved*].

(xiii) The Control system shall incorporate interlocks for supplemental guards, if used, which will prevent stroke initiation or will stop a stroke in progress if any supplemental guard fails or is deactivated.

(xiv) The control system shall perform checks for proper operation of all cycle control logic element switches and contacts at least once each cycle. Control elements shall be checked for correct status after power "on" and before the initial PSDI stroke.

(xv) The control system shall have provisions for an "inch" operating means meeting the requirements of paragraph (b)(7)(iv) of this section. Die-setting shall not be done in the PSDI mode. Production shall not be done in the "inch" mode.

(xvi) The control system shall permit only a single stroke per initiation command.

(xvii) Controls with internally stored programs (e.g., mechanical, electro-mechanical, or electronic) shall meet the requirements of paragraph (b)(13) of this section, and shall default to a predetermined safe condition in the event of any single failure within the system. Programmable controllers which meet the requirements for controls with internally stored programs stated above shall be permitted only if all logic elements affecting the safety system and point of operation safety are internally stored and protected in such a manner that they cannot be altered or manipulated by the user to an unsafe condition.

(7) *Environmental requirements.* Control components shall be selected, constructed, and connected together in such a way as to withstand expected operational and environmental stresses, at least including those outlined in Appendix A. Such stresses shall not so

affect the control system as to cause unsafe operation.

(8) *Safety system.* (i) Mechanical power presses used in the PSDI mode shall be operated under the control of a safety system which, in addition to meeting the applicable requirements of paragraphs (b)(13) and (c)(5) and other applicable provisions of this section, shall function such that a single failure or single operating error shall not cause injury to personnel from point of operation hazards.

(ii) The safety system shall be designed, constructed, and arranged as an integral total system, including all elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator and that part of the environment which has effect on the protection against point of operation hazards.

(9) *Safeguarding the point of operation.* (i) The point of operation of presses operated in the PSDI mode shall be safeguarded in accordance with the requirements of paragraph (c) of this section, except that the safety distance requirements of paragraph (h)(9)(v) of this section shall be used for PSDI operation.

(ii)(A) PSDI shall be implemented only by use of light curtain (photo-electric) presence sensing devices which meet the requirements of paragraph (c)(3)(iii)(*c*) of this section unless the requirements of the following paragraph have been met.

(B) Alternatives to photo-electric light curtains may be used for PSDI when the employer can demonstrate, through tests and analysis by the employer or the manufacturer, that the alternative is as safe as the photo-electric light curtain, that the alternative meets the conditions of this section, has the same long term reliability as light curtains and can be integrated into the entire safety system as provided for in this section. Prior to use, both the employer and manufacturer must certify that these requirements and all the other applicable requirements of this section are met and these certifications must be validated by an OSHA-recognized third-party validation organization to meet these additional requirements and all the other applicable requirements of paragraphs (a) through (h) and Appendix A of this section. Three months prior to the operation of any alternative system, the employer must notify the OSHA Directorate of Safety Standards Programs of the name of the system to be installed, the manufacturer and the OSHA-recognized third-party validation organization immediately. Upon request, the employer must make available to that office all tests and analyses for OSHA review.

(iii) Individual sensing fields of presence sensing devices used to initiate strokes in the PSDI mode shall cover only one side of the press.

(iv) Light curtains used for PSDI operation shall have minimum object sensitivity not to exceed one and one-fourth inches (31.75 mm). Where light curtain object sensitivity is user-adjustable, either discretely or continuously, design features shall limit the minimum object sensitivity adjustment not to exceed one and one-fourth inches (31.75 mm). Blanking of the sensing field is not permitted.

(v) The safety distance (Ds) from the sensing field of the presence sensing device to the point of operation shall be greater than or equal to the distance determined by the formula:

$$Ds = Hs \times (Ts + Tp + Tr + 2Tm) + Dp$$

Where:

Ds = Minimum safety distance.

Hs = Hand speed constant of 63 inches per second (1.6 m/s).

Ts = Longest press stopping time, in seconds, computed by taking averages of multiple measurements at each of three positions (45 degrees, 60 degrees, and 90 degrees) of crankshaft angular position; the longest of the three averages is the stopping time to use. (Ts is defined as the sum of the kinetic energy dissipation time plus the pneumatic/magnetic/hydraulic reaction time of the clutch/brake operating mechanism(s).)

Tp = Longest presence sensing device response time, in seconds.

Tr = Longest response time, in seconds, of all interposing control elements between the presence sensing device and the clutch/brake operating mechanism(s).

Tm = Increase in the press stopping time at the top of the stroke, in seconds, allowed by the brake monitor for brake wear. The time increase allowed shall be limited to no more than 10 percent of the longest press stopping time measured at the top of the stroke, or 10 milliseconds, whichever is longer.

Dp = Penetration depth factor, required to provide for possible penetration through the presence sensing field by fingers or hand before detection occurs. The penetration depth factor shall be determined from Graph h–1 using the minimum object sensitivity size.

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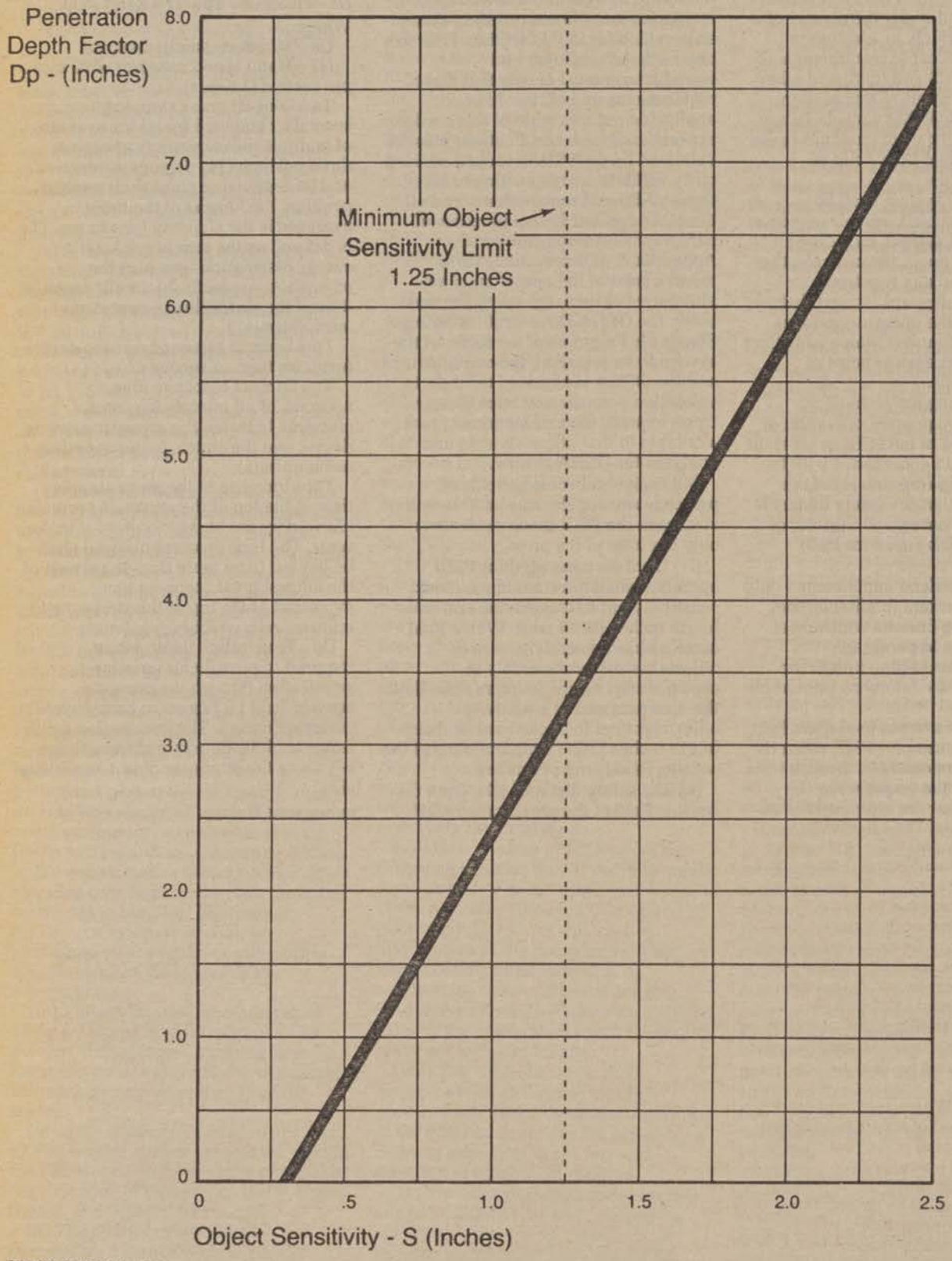
Penetration Depth Factor Calculation

$Dp = 3.4 (S-0.276)$



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(vi) The presence sensing device location shall either be set at each tool change and set-up to provide at least the minimum safety distance, or fixed in location to provide a safety distance greater than or equal to the minimum safety distance for all tooling set-ups which are to be used on that press.

(vii) Where presence sensing device location is adjustable, adjustment shall require the use of a special tool available only to authorized persons.

(viii) Supplemental safeguarding shall be used to protect all areas of access to the point of operation which are unprotected by the PSDI presence sensing device. Such supplemental safeguarding shall consist of either additional light curtain (photo-electric) presence sensing devices or other types of guards which meet the requirements of paragraphs (c) and (h) of this section.

(A) Presence sensing devices used as supplemental safeguarding shall not initiate a press stroke, and shall conform to the requirements of paragraph (c)(3)(iii) and other applicable provisions of this section, except that the safety distance shall comply with paragraph (h)(9)(v) of this section.

(B) Guards used as supplemental safeguarding shall conform to the design, construction and application requirements of paragraph (c)(2) of this section, and shall be interlocked with the press control to prevent press PSDI operation if the guard fails, is removed, or is out of position.

(ix) Barriers shall be fixed to the press frame or bolster to prevent personnel from passing completely through the sensing field, where safety distance or press configuration is such that personnel could pass through the PSDI presence sensing field and assume a position where the point of operation could be accessed without detection by the PSDI presence sensing device. As an alternative, supplemental presence sensing devices used only in the safeguard mode may be provided. If used, these devices shall be located so as to detect all operator locations and positions not detected by the PSDI sensing field, and shall prevent stroking or stop a stroke in process when any supplemental sensing field(s) are interrupted.

(x) Hand tools. Where tools are used for feeding, removal of scrap, lubrication of parts, or removal of parts that stick on the die in PSDI operations:

(A) The minimum diameter of the tool handle extension shall be greater than the minimum object sensitivity of the presence sensing device(s) used to initiate press strokes; or

(B) The length of the hand tool shall be such as to ensure that the operator's hand will be detected for any safety distance required by the press set-ups.

(10) *Inspection and maintenance.* (i) Any press equipped with presence sensing devices for use in PSDI, or for supplemental safeguarding on presses used in the PSDI mode, shall be equipped with a test rod of diameter specified by the presence sensing device manufacturer to represent the minimum object sensitivity of the sensing field. Instructions for use of the test rod shall be noted on a label affixed to the presence sensing device.

(ii) The following checks shall be made at the beginning of each shift and whenever a die change is made.

(A) A check shall be performed using the test rod according to the presence sensing device manufacturer's instructions to determine that the presence sensing device used for PSDI is operational.

(B) The safety distance shall be checked for compliance with (h)(9)(v) of this section.

(C) A check shall be made to determine that all supplemental safeguarding is in place. Where presence sensing devices are used for supplemental safeguarding, a check for proper operation shall be performed using the test rod according to the presence sensing device manufacturer's instructions.

(D) A check shall be made to assure that the barriers and/or supplemental presence sensing devices required by paragraph (h)(9)(ix) of this section are operating properly.

(E) A system or visual check shall be made to verify correct counterbalance adjustment for die weight according to the press manufacturer's instructions, when a press is equipped with a slide counterbalance system.

(iii) When presses used in the PSDI mode have flywheel or bullgear running on crankshaft mounted journals and bearings, or a flywheel mounted on back shaft journals and bearings, periodic inspections following the press manufacturer's recommendations shall be made to ascertain that bearings are in good working order, and that automatic lubrication systems for these bearings (if automatic lubrication is provided) are supplying proper lubrication. On presses with provision for manual lubrication of flywheel or bullgear bearings, lubrication shall be provided according to the press manufacturer's recommendations.

(iv) Periodic inspections of clutch and brake mechanisms shall be performed to assure they are in proper operating condition. The press manufacturer's recommendations shall be followed.

(v) When any check of the press, including those performed in accordance with the requirements of paragraphs (h)(10)(ii), (iii) or (iv) of this section, reveals a condition of noncompliance, improper adjustment, or failure, the press shall not be operated until the condition has been corrected by adjustment, replacement, or repair.

(vi) It shall be the responsibility of the employer to ensure the competence of personnel caring for, inspecting, and maintaining power presses equipped for PSDI operation, through initial and periodic training.

(11) *Safety system certification/validation.* (i) Prior to the initial use of any mechanical press in the PSDI mode, two sets of certification and validation are required:

(A) The design of the safety system required for the use of a press in the PSDI mode shall be certified and validated prior to installation. The manufacturer's certification shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of paragraphs (a) through (h) and Appendix A of this section.

(B) After a press has been equipped with a safety system whose design has been certified and validated in accordance with paragraph (h)(11)(i) of this section, the safety system installation shall be certified by the employer, and then shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of paragraphs (a) through (h) and Appendix A of this section.

(ii) At least annually thereafter, the safety system on a mechanical power press used in the PSDI mode shall be recertified by the employer and revalidated by an OSHA-recognized third-party validation organization to meet all applicable requirements of paragraphs (a) through (h) and Appendix A of this section. Any press whose safety system has not been recertified and revalidated within the preceding 12 months shall be removed from service in the PSDI mode until the safety system is recertified and revalidated.

(iii) A label shall be affixed to the press as part of each installation certification/validation and the most recent recertification/revalidation. The label shall indicate the press serial number, the minimum safety distance (Ds) required by paragraph (h)(9)(v) of this section, the fulfillment of design certification/validation, the employer's signed certification, the identification of the OSHA-recognized third-party

validation organization, its signed validation, and the date the certification/validation and recertification/revalidation are issued.

(iv) Records of the installation certification and validation and the most recent recertification and revalidation shall be maintained for each safety system equipped press by the employer as long as the press is in use. The records shall include the manufacture and model number of each component and subsystem, the calculations of the safety distance as required by paragraph (h)(9)(v) of this section, and the stopping time measurements required by paragraph (h)(2)(ii) of this section. The most recent records shall be made available to OSHA upon request.

(v) The employer shall notify the OSHA-recognized third-party validation organization within five days whenever a component or a subsystem of the safety system fails or modifications are made which may affect the safety of the system. The failure of a critical component shall necessitate the removal of the safety system from service until it is recertified and revalidated, except recertification by the employer without revalidation is permitted when a non-critical component or subsystem is replaced by one of the same manufacture and design as the original, or determined by the third-party validation organization to be equivalent by similarity analysis, as set forth in Appendix A.

(vi) The employer shall notify the OSHA-recognized third-party validation organization within five days of the occurrence of any point of operation injury while a press is used in the PSDI mode. This is in addition to the report of injury required by paragraph (g) of this section; however, a copy of that report may be used for this purpose.

(12) *Die setting and work set-up.* (i) Die setting on presses used in the PSDI mode shall be performed in accordance with paragraphs (d) and (h) of this section.

(ii) The PSDI mode shall not be used for die setting or set-up. An alternative manual cycle initiation and control means shall be supplied for use in die setting which meets the requirements of paragraph (b)(7) of this section.

(iii) Following a die change, the safety distance, the proper application of supplemental safeguarding, and the slide counterbalance adjustment (if the press is equipped with a counterbalance) shall be checked and maintained by authorized persons whose qualifications include knowledge of the safety distance, supplemental safeguarding requirements, and the manufacturer's specifications for counterbalance adjustment. Adjustment of the location of the PSDI presence sensing device shall require use of a special tool available only to the authorized persons.

(13) *Operator training.* (i) The operator training required by paragraph (f)(2) of this section shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode.

(A) The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by paragraph (h)(10)(i) of this section.

(B) The safety distance required.

(C) The operation, function and performance of the PSDI mode.

(D) The requirements for hand tools that may be used in the PSDI mode.

(E) The severe consequences that can result if he or she attempts to circumvent or by-pass any of the safeguard or operating functions of the PSDI system.

(ii) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health.

4. Appendices A–D are added to § 1910.217 to read as follows:

Appendix A to § 1910.217.—Mandatory Requirements for Certification/Validation of Safety Systems for Presence Sensing Device Initiation of Mechanical Power Presses

Purpose

The purpose of the certification/validation of safety systems for presence sensing device initiation (PSDI) of mechanical power presses is to ensure that the safety systems are designed, installed, and maintained in accordance with all applicable requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A.

General

The certification/validation process shall utilize an independent third-party validation organization recognized by OSHA in accordance with the requirements specified in Appendix C of this section.

While the employer is responsible for assuring that the certification/validation requirements in §1910.217(h)(11) are fulfilled, the design certification of PSDI safety systems may be initiated by manufacturers, employers, and/or their representatives. The term "manufacturers" refers to the manufacturer of any of the components of the safety system. An employer who assembles a PSDI safety system would be a manufacturer as well as employer for purposes of this standard and Appendix.

The certification/validation process includes two stages. For design certification, in the first stage, the manufacturer (which can be an employer) certifies that the PSDI safety system meets the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A, based on appropriate design criteria and tests. In the second stage, the OSHA-recognized third-party validation organization validates that the PSDI safety system meets the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A and the manufacturer's certification by reviewing the manufacturer's design and test data and performing any additional reviews required by this standard or which it believes appropriate.

For installation certification/validation and annual recertification/revalidation, in the first stage the employer certifies or recertifies that the employer is installing or utilizing a PSDI safety system validated as meeting the design requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A by an OSHA-recognized third-party validation organization and that the installation, operation and maintenance meet the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A. In the second stage, the OSHA-recognized third-party validation organization validates or revalidates that the PSDI safety system installation meets the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A and the employer's certification, by reviewing that the PSDI safety system has been certified; the employer's certification, designs and tests, if any; the installation, operation, maintenance and training; and by performing any additional tests and reviews which the validation organization believes is necessary.

Summary

The certification/validation of safety systems for PSDI shall consider the press, controls, safeguards, operator, and environment as an integrated system which shall comply with all of the requirements in 29 CFR 1910.217 (a) through (h) and this Appendix A. The certification/validation process shall verify that the safety system complies with the OSHA safety requirements as follows:

A. Design Certification/Validation

1. The major parts, components and subsystems used shall be defined by part number or serial number, as appropriate, and by manufacturer to establish the configuration of the system.

2. The identified parts, components and subsystems shall be certified by the manufacturer to be able to withstand the

functional and operational environments of the PSDI safety system.

3. The total system design shall be certified by the manufacturer as complying with all requirements in 29 CFR 1910.217 (a) through (h) and this Appendix A.

4. The third-party validation organization shall validate the manufacturer's certification under paragraphs 2 and 3.

B. Installation Certification/Validation

1. The employer shall certify that the PSDI safety system has been design certified and validated, that the installation meets the operational and environmental requirements specified by the manufacturer, that the installation drawings are accurate, and that the installation meets the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A. (The operational and installation requirements of the PSDI safety system may vary for different applications.)

2. The third-party validation organization shall validate the employer's certifications that the PSDI safety system is design certified and validated, that the installation meets the installation and environmental requirements specified by the manufacturer, and that the installation meets the requirements of 29 CFR 1910.217 (a) through (h) and this Appendix A.

C. Recertification/Revalidation

1. The PSDI safety system shall remain under certification/validation for the shorter of one year or until the system hardware is changed, modified or refurbished, or operating conditions are changed (including environmental, application or facility changes), or a failure of a critical component has occurred.

2. Annually, or after a change specified in paragraph 1., the employer shall inspect and recertify the installation as meeting the requirements set forth under B., Installation Certification/Validation.

3. The third-party validation organization, annually or after a change specified in paragraph 1., shall validate the employer's certification that the requirements of paragraph B., Installation Certification/Validation have been met.

(**Note:** Such changes in operational conditions as die changes or press relocations not involving disassembly or revision to the safety system would not require recertification/revalidation.)

Certification/Validation Requirements

A. General Design Certification/Validation Requirements

1. *Certification/Validation Program Requirements.* The manufacturer shall certify and the OSHA-recognized third-party validation organization shall validate that:

(a) The design of components, subsystems, software and assemblies meets OSHA performance requirements and are ready for the intended use; and

(b) The performance of combined subsystems meets OSHA's operational requirements.

2. *Certification/Validation Program Level of Risk Evaluation Requirements.* The manufacturer shall evaluate and certify, and the OSHA-recognized third-party validation organization shall validate, the design and operation of the safety system by determining conformance with the following:

a. The safety system shall have the ability to sustain a single failure or a single operating error and not cause injury to personnel from point of operation hazards. Acceptable design features shall demonstrate, in the following order or precedence, that:

(1) No single failure points may cause injury; or

(2) Redundancy, and comparison and/or diagnostic checking, exist for the critical items that may cause injury, and the electrical, electronic, electromechanical and mechanical parts and components are selected so that they can withstand operational and external environments. The safety factor and/or derated percentage shall be specifically noted and complied with.

b. The manufacturer shall design, evaluate, test and certify, and the third-party validation organization shall evaluate and validate, that the PSDI safety system meets appropriate requirements in the following areas.

(1) Environmental Limits

(a) Temperature

(b) Relative humidity

(c) Vibration

(d) Fluid compatability with other materials

(2) Design Limits

(a) Power requirements

(b) Power transient tolerances

(c) Compatability of materials used

(d) Material stress tolerances and limits

(e) Stability to long term power fluctuations

(f) Sensitivity to signal acquisition

(g) Repeatability of measured parameter without inadvertent initiation of a press stroke

(h) Operational life of components in cycles, hours, or both

(i) Electromagnetic tolerance to:

(*1*) Specific operational wave lengths; and

(*2*) Externally generated wave lengths

(3) *New Design Certification/Validation.* Design certification/validation for a new safety system, i.e., a new design or new integration of specifically identified components and subsystems, would entail a single certification/validation which would be applicable to all identical safety systems. It would not be necessary to repeat the tests on individual safety systems of the same manufacture or design. Nor would it be necessary to repeat these tests in the case of modifications where determined by the manufacturer and validated by the third-party validation organization to be equivalent by similarity analysis. Minor modifications not affecting the safety of the system may be made by the manufacturer without revalidation.

Substantial modifications would require testing as a new safety system, as deemed necessary by the validation organization.

B. Additional Detailed Design Certification/Validation Requirements

1. *General.* The manufacturer or the manufacturer's representative shall certify to and submit to an OSHA-recognized third-party validation organization the documentation necessary to demonstrate that the PSDI safety system design is in full compliance with the requirements of 29 CFR 1910.217(a)–(h) and this Appendix A, as applicable, by means of analysis, tests, or combination of both, establishing that the following additional certification/validation requirements are fulfilled.

2. *Reaction Times.* For the purpose of demonstrating compliance with the reaction time required by §1910.217(h), the tests shall use the following definitions and requirements:

a. "Reaction time" means the time, in seconds, it takes the signal, required to activate/deactivate the system, to travel through the system, measured from the time of signal initiation to the time the function being measured is completed.

b. "Full stop" or "No movement of the slide or ram" means when the crankshaft rotation has slowed to two or less revolutions per minute, just before stopping completely.

c. "Function completion" means for, electrical, electromechanical and electronic devices, when the circuit produces a change of state in the output element of the device.

d. When the change of state is motion, the measurement shall be made at the completion of the motion.

e. The generation of the test signal introduced into the system for measuring reaction time shall be such that the initiation time can be established with an error of less than 0.5 percent of the reaction time measured.

f. The instrument used to measure reaction time shall be calibrated to be accurate to within 0.001 second.

3. *Compliance with § 1910.217(h)(2)(ii).* For compliance with these requirements, the average value of the stopping time, Ts, shall be the arithmetic mean of at least 25 stops for each stop angle initiation measured with the brake and/or clutch unused, 50 percent worn, and 90 percent worn. The recommendations of the brake system manufacturer shall be used to simulate or estimate the brake wear. The manufacturer's recommended minimum lining depth shall be identified and documented, and an evaluation made that the minimum depth will not be exceeded before the next (annual) recertification/revalidation. A correlation of the brake and/or clutch degradation based on the above tests and/or estimates shall be made and documented. The results shall document the conditions under which the brake and/or clutch will and will not comply with the requirement. Based upon this determination, a scale shall be developed to indicate the allowable 10 percent of the stopping time at the top of the stroke for slide or ram overtravel due to brake wear. The scale shall be marked to indicate that brake adjustment and/or replacement is required. The explanation and use of the scale shall be documented.

The test specification and procedure shall be submitted to the validation organization for review and validation prior to the test. The validation organization representative shall witness at least one set of tests.

4. *Compliance with §§ 1910.217(h)(5)(iii) and (h)(9)(v).* Each reaction time required to calculate the Safety Distance, including the brake monitor setting, shall be documented in separate reaction time tests. These tests shall specify the acceptable tolerance band

sufficient to assure that tolerance build-up will not render the safety distance unsafe.

a. Integrated test of the press fully equipped to operate in the PSDI mode shall be conducted to establish the total system reaction time.

b. Brakes which are the adjustable type shall be adjusted properly before the test.

5. *Compliance with § 1910.217(h)(2)(iii).* a. Prior to conducting the brake system test required by paragraph (h)(2)(ii), a visual check shall be made of the springs. The visual check shall include a determination that the spring housing or rod does not show damage sufficient to degrade the structural integrity of the unit, and the spring does not show any tendency to interleave.

b. Any detected broken or unserviceable springs shall be replaced before the test is conducted. The test shall be considered successful if the stopping time remains within that which is determined by paragraph (h)(9)(v) for the safety distance setting. If the increase in press stopping time exceeds the brake monitor setting limit defined in paragraph (h)(5)(iii), the test shall be considered unsuccessful, and the cause of the excessive stopping time shall be investigated. It shall be ascertained that the springs have not been broken and that they are functioning properly.

6. *Compliance with § 1910.217(h)(7).* a. Tests which are conducted by the manufacturers of electrical components to establish stress, life, temperature and loading limits must be tests which are in compliance with the provisions of the National Electrical Code.

b. Electrical and/or electronic cards or boards assembled with discreet components shall be considered a subsystem and shall require separate testing that the subsystems do not degrade in any of the following conditions:

(1) Ambient temperature variation from −20° C to +50° C.

(2) Ambient relative humidity of 99 percent.

(3) Vibration of 45G for one millisecond per stroke when the item is to be mounted on the press frame.

(4) Electromagnetic interference at the same wavelengths used for the radiation sensing field, at the power line frequency fundamental and harmonics, and also from outogenous radiation due to system switching.

(5) Electrical power supply variations of ±15 percent.

c. The manufacturer shall specify the test requirements and procedures from existing consensus tests in compliance with the provisions of the National Electrical Code.

d. Tests designed by the manufacturer shall be made available upon request to the validation organization. The validation organization representative shall witness at least one set of each of these tests.

7. *Compliance with § 1910.217(h)(9)(iv).* a. The manufacturer shall design a test to demonstrate that the prescribed minimum object sensitivity of the presence sensing device is met.

b. The test specifications and procedures shall be made available upon request to the validation organization.

8. *Compliance with § 1910.217(h)(9)(x).* a. The manufacturer shall design a test(s) to establish the hand tool extension diameters allowed for variations in minimum object sensitivity response.

b. The test(s) shall document the range of object diameter sizes which will produce both single and double break conditions.

c. The test(s) specifications and procedures shall be made available upon request to the validation organization.

9. *Integrated Tests Certification/Validation.* a. The manufacturer shall design a set of integrated tests to demonstrate compliance with the following requirements:

Sections 1910.217(h)(6) (ii); (iii); (iv); (v); (vi); (vii); (viii); (ix); (xi); (xii); (xiii); (xiv); (xv); and (xvii).

b. The integrated test specifications and procedures shall be made available to the validation organization.

10. *Analysis.* a. The manufacturer shall submit to the validation organization the technical analysis such as Hazard Analysis, Failure Mode and Effect Analysis, Stress Analysis, Component and Material Selection Analysis, Fluid Compatibility, and/or other analyses which may be necessary to demonstrate, compliance with the following requirements:

Sections 1910.217(h)(8) (i) and (ii); (h)(2) (ii) and (iii); (h)(3)(i) (A) and (C), and (ii); (h)(5) (i), (ii) and (iii); (h)(6) (i), (iii), (iv), (vi), (vii), (viii), (ix), (x), (xi), (xiii), (xiv), (xv), (xvi), and (xvii); (h)(7) (i) and (ii); (h)(9) (iv), (v), (viii), (ix) and (x); (h)(10) (i) and (ii).

11. *Types of Tests Acceptable for Certification/Validation.* a. Test results obtained from development testing may be used to certify/validate the design.

b. The test results shall provide the engineering data necessary to establish confidence that the hardware and software will meet specifications, the manufacturing process has adequate quality control and the data acquired was used to establish processes, procedures, and test levels supporting subsequent hardware design, production, installation and maintenance.

12. *Validation for Design Certification/Validation.* If, after review of all documentation, tests, analyses, manufacturer's certifications, and any additional tests which the third-party validation organization believes are necessary, the third-party validation organization determines that the PSDI safety system is in full compliance with the applicable requirements of 29 CFR 1910.217(a) through (h) and this Appendix A, it shall validate the manufacturer's certification that it so meets the stated requirements.

C. Installation Certification/Validation Requirements

1. The employer shall evaluate and test the PSDI system installation, shall submit to the OSHA-recognized third-party validation organization the necessary supporting documentation, and shall certify that the requirements of § 1910.217(a) through (h) and this Appendix A have been met and that the installation is proper.

2. The OSHA-recognized third-party validation organization shall conduct tests, and/or review and evaluate the employer's installation tests, documentation and representations. If it so determines, it shall validate the employer's certification that the PSDI safety system is in full conformance with all requirements of 29 CFR 1910.217(a) through (h) and this Appendix A.

D. Recertification/Revalidation Requirements

1. A PSDI safety system which has received installation certification/validation shall undergo recertification/revalidation the earlier of:

a. Each time the systems hardware is significantly changed, modified, or refurbished;

b. Each time the operational conditions are significantly changed (including environmental, application or facility changes, but excluding such changes as die changes or press relocations not involving revision to the safety system);

c. When a failure of a significant component has occurred or a change has been made which may affect safety; or

d. When one year has elapsed since the installation certification/validation or the last recertification/revalidation.

2. *Conduct or recertification/revalidation.* The employer shall evaluate and test the PSDI safety system installation, shall submit to the OSHA-recognized third-party validation organization the necessary supporting documentation, and shall recertify that the requirements of § 1910.217(a) through (h) and this Appendix are being met. The documentation shall include, but not be limited to, the following items:

a. Demonstration of a thorough inspection of the entire press and PSDI safety system to ascertain that the installation, components and safeguarding have not been changed, modified or tampered with since the installation certification/validation or last recertification/revalidation was made.

b. Demonstrations that such adjustments as may be needed (such as to the brake monitor setting) have been accomplished with proper changes made in the records and on such notices as are located on the press and safety system.

c. Demonstration that review has been made of the reports covering the design certification/validation, the installation certification/validation, and all recertification/revalidations, in order to detect any degradation to an unsafe condition, and that necessary changes have been made to restore the safety system to previous certification/validation levels.

3. The OSHA-recognized third-party validation organization shall conduct tests, and/or review and evaluate the employer's installation, tests, documentation and representations. If it so determines, it shall revalidate the employer's recertification that the PSDI system is in full conformance with all requirements of 29 CFR 1910.217(a) through (h) and this Appendix A.

Appendix B to § 1910.217—Nonmandatory Guidelines for Certification/Validation of Safety Systems for Presence Sensing Device Initiation of Mechanical Power Presses

Objectives

This Appendix provides employers, manufacturers, and their representatives, with nonmandatory guidelines for use in developing certification documents.

Employers and manufacturers are encouraged to recommend other approaches if there is a potential for improving safety and reducing cost. The guidelines apply to certification/validation activity from design evaluation through the completion of the installation test and the annual recertification/revalidation tests.

General Guidelines

A. The certification/validation process should confirm that hazards identified by hazard analysis, (HA), failure mode effect analysis (FMEA), and other system analyses have been eliminated by design or reduced to an acceptable level through the use of appropriate design features, safety devices, warning devices, or special procedures. The certification/validation process should also confirm that residual hazards identified by operational analysis are addressed by warning, labeling safety instructions or other appropriate means.

B. The objective of the certification/validation program is to demonstrate and document that the system satisfies specification and operational requirements for safe operations.

Quality Control

The safety attributes of a certified/validated PSDI safety system are more likely to be maintained if the quality of the system and its parts, components and subsystem is consistently controlled. Each manufacturer supplying parts, components, subsystems, and assemblies needs to maintain the quality of the product, and each employer needs to maintain the system in a non-degraded condition.

Analysis Guidelines

A. Certification/validation of hardware design below the system level should be accomplished by test and/or analysis.

B. Analytical methods may be used in lieu of, in combination with, or in support of tests to satisfy specification requirements.

C. Analyses may be used for certification/validation when existing data are available or when test is not feasible.

D. Similarity analysis may be used in lieu of tests where it can be shown that the article is similar in design, manufacturing process, and quality control to another article that was previously certified/validated in accordance with equivalent or more stringent criteria. If previous design, history and application are considered to be similar, but not equal to or more exacting than earlier experiences, the additional or partial certification/validation tests should concentrate on the areas of changed or increased requirements.

Analysis Reports

The analysis reports should identify: (1) The basis for the analysis; (2) the hardware or software items analyzed; (3) conclusions; (4) safety factors; and (5) limit of the analysis. The assumptions made during the analysis should be clearly stated and a description of the effects of these assumptions on the conclusions and limits should be included.

Certification/validation by similarity analysis reports should identify, in addition to the above, application of the part, component or subsystem for which certification/validation is being sought as well as data from previous usage establishing adequacy of the item. Similarity analysis should not be accepted when the internal and external stresses on the item being certified/validated are not defined.

Usage experience should also include failure data supporting adequacy of the design.

Appendix C to § 1910.217—Mandatory Requirements for OSHA Recognition of Third-Party Validation Organizations for the PSDI Standard

This Appendix prescribes mandatory requirements and procedures for OSHA recognition of third-party validation organizations to validate employer and manufacturer certifications that their equipment and practices meet the requirements of the PSDI standard. The scope of the Appendix includes the three categories of certification/validation required by the PSDI standard: Design Certification/Validation, Installation Certification/Validation, and Annual Recertification/Revalidation.

If further detailing of these provisions will assist the validation organization or OSHA in this activity, this detailing will be done through appropriate OSHA Program Directives.

I. Procedure for OSHA Recognition of Validation Organizations

A. Applications

1. *Eligibility.* a. Any person or organization considering itself capable of conducting a PSDI-related third-party validation function may apply for OSHA recognition.

b. However, in determining eligibility for a foreign-based third-party validation organization, OSHA shall take into consideration whether there is reciprocity of treatment by the foreign government after consultation with relevant U.S. government agencies.

2. *Content of application.* a. The application shall identify the scope of the validation activity for which the applicant wishes to be recognized, based on one of the following alternatives:

(1) Design Certification/Validation, Installation Certification/Validation, and Annual Recertification/Revalidation;

(2) Design Certification/Validation only; or

(3) Installation/Certification/Validation and Annual Recertification/Revalidation.

b. The application shall provide information demonstrating that it and any validating laboratory utilized meet the qualifications set forth in section II of this Appendix.

c. The applicant shall provide information demonstrating that it and any validating laboratory utilized meet the program requirements set forth in section III of this Appendix.

d. The applicant shall identify the test methods it or the validating laboratory will use to test or judge the components and operations of the PSDI safety system required to be tested by the PSDI standard and Appendix A, and shall specify the reasons the test methods are appropriate.

e. The applicant may include whatever enclosures, attachments, or exhibits the applicant deems appropriate. The application need not be submitted on a Federal form.

f. The applicant shall certify that the information submitted is accurate.

3. *Filing office location.* The application shall be filed with: PSDI Certification/Validation Program, Office of Variance Determination, Occupational Safety and Health Administration, U.S. Department of Labor, Room N3653, 200 Constitution Avenue, NW., Washington, DC 20210.

4. *Amendments and withdrawals.* a. An application may be revised by an applicant at any time prior to the completion of the final staff recommendation.

b. An application may be withdrawn by an applicant, without prejudice, at any time prior to the final decision by the Assistant Secretary in paragraph I.B.8.b.(4) of this Appendix.

B. Review and Decision Process

1. *Acceptance and field inspection.* All applications submitted will be accepted by OSHA, and their receipt acknowledged in writing. After receipt of an application, OSHA may request additional information if it believes information relevant to the requirements for recognition have been omitted. OSHA may inspect the facilities of the third-party validation organization and any validating laboratory, and while there shall review any additional documentation underlying the application. A report shall be made of each field inspection.

2. *Requirements for recognition.* The requirements for OSHA recognition of a third-party validation organization for the PSDI standard are that the program has fulfilled the requirements of section II of this Appendix for qualifications and of section III of this Appendix for program requirements, and the program has identified appropriate test and analysis methods to meet the requirements of the PSDI standard and Appendix A.

3. *Preliminary approval.* If, after review of the application, any additional information, and the inspection report, the applicant and any validating laboratory appear to have met the requirements for recognition, a written recommendation shall be submitted by the responsible OSHA personnel to the Assistant Secretary to approve the application with a supporting explanation.

4. *Preliminary disapproval.* If, after review of the application, additional information, and inspection report, the applicant does not appear to have met the requirements for recognition, the Director of the PSDI certification/validation program shall notify the applicant in writing, listing the specific requirements of this Appendix which the applicant has not met, and the reasons.

5. *Revision of application.* After receipt of a notification of preliminary disapproval, the applicant may submit a revised application for further review by OSHA pursuant to subsection I.B. of this Appendix or may request that the original application be submitted to the Assistant Secretary with a statement of reasons supplied by the applicant as to why the application should be approved.

6. *Preliminary decision by Assistant Secretary.* a. The Assistant Secretary, or a special designee for this purpose, will make a preliminary decision whether the applicant has met the requirements for recognition based on the completed application file and the written staff recommendation, as well as the statement of reasons by the applicant if there is a recommendation of disapproval.

b. This preliminary decision will be sent to the applicant and subsequently published in the **Federal Register.**

7. *Public review and comment period.* a. The **Federal Register** notice of preliminary decision will provide a period of not less than 60 calendar days for the written comments on the applicant's fulfillment of the requirements for recognition. The application, supporting documents, staff recommendation, statement of applicant's reasons, and any comments received, will be available for public inspection in the OSHA Docket Office.

b. If the preliminary decision is in favor of recognition, a member of the public, or if the preliminary decision is against recognition, the applicant may request a public hearing by the close of the comment period, if it supplies detailed reasons and evidence challenging the basis of the Assistant Secretary's preliminary decision and justifying the need for a public hearing to bring out evidence which could not be effectively supplied through written submissions.

8. *Final decision by Assistant Secretary—*
a. *Without hearing.* If there are no valid requests for a hearing, based on the application, supporting documents, staff recommendation, evidence and public comment, the Assistant Secretary shall issue the final decision (including reasons) of the Department of Labor on whether the applicant has demonstrated by a preponderance of the evidence that it meets the requirements for recognition.

b. *After hearing.* If there is a valid request for a hearing pursuant to paragraph I.B.7.b. of this Appendix, the following procedures will be used:

(1) The Assistant Secretary will issue a notice of hearing before an administrative law judge of the Department of Labor pursuant to the rules specified in 29 CFR Part 1905, Subpart C.

(2) After the hearing, pursuant to Subpart C, the administrative law judge shall issue a decision (including reasons) based on the application, the supporting documentation, the staff recommendation, the public comments and the evidence submitted during the hearing (the record), stating whether it has been demonstrated, based on a preponderance of evidence, that the applicant meets the requirements for recognition. If no exceptions are filed, this is the final decision of the Department of Labor.

(3) Upon issuance of the decision, any party to the hearing may file exceptions within 20 days pursuant to Subpart C. If exceptions are filed, the administrative law judge shall forward the decision, exceptions and record to the Assistant Secretary for the final decision on the application.

(4) The Assistant Secretary shall review the record, the decision by the administrative law judge, and the exceptions. Based on this, the Assistant Secretary shall issue the final decision (including reasons) of the Department of Labor stating whether the applicant has demonstrated by a preponderance of evidence that it meets the requirements for recognition.

b. *Publication.* A notification of the final decision shall be published in the **Federal Register.**

C. Terms and Conditions of Recognition, Renewal and Revocation

1. The following terms and conditions shall be part of every recognition:

a. The recognition of any validation organization will be evidenced by a letter of recognition from OSHA. The letter will provide the specific details of the scope of the OSHA recognition as well as any conditions imposed by OSHA, including any Federal monitoring requirements.

b. The recognition of each validation organization will be valid for five years, unless terminated before or renewed after the expiration of the period. The dates of the period of recognition will be stated in the recognition letter.

c. The recognized validation organization shall continue to satisfy all the requirements of this Appendix and the letter of recognition during the period of recognition.

2. A recognized validation organization may change a test method of the PSDI safety system certification/validation program by notifying the Assistant Secretary of the change, certifying that the revised method will be at least as effective as the prior method, and providing the supporting data upon which its conclusions are based.

3. A recognized validation organization may renew its recognition by filing a renewal request at the address in paragraph I.A.3. of this Appendix, above, not less than 180 calendar days, nor more than one year, before the expiration date of its current recognition. When a recognized validation organization has filed such a renewal request, its current recognition will not expire until a final decision has been made on the request. The renewal request will be processed in accordance with subsection I.B. of this Appendix, above, except that a reinspection is not required but may be performed by OSHA. A hearing will be granted to an objecting member of the public if evidence of failure to meet the requirements of this Appendix is supplied to OSHA.

4. A recognized validation organization may apply to OSHA for an expansion of its current recognition to cover other categories of PSDI certification/validation in addition to those included in the current recognition. The application for expansion will be acted upon and processed by OSHA in accordance with subsection I.B. of this Appendix, subject to the possible reinspection exception. If the validation organization has been recognized for more than one year, meets the requirements for expansion of recognition, and there is no evidence that the recognized validation organization has not been following the requirements of this Appendix and the letter of recognition, an expansion will normally be granted. A hearing will be granted to an objecting member of the public only if evidence of failure to meet the requirements of this Appendix is supplied to OSHA.

5. A recognized validation organization may voluntarily terminate its recognition, either in its entirety or with respect to any area covered in its recognition, by giving written notice to OSHA at any time. The written notice shall indicate the termination date. A validation organization may not terminate its installation certification and recertification validation functions earlier than either one year from the date of the written notice, or the date on which another recognized validation organization is able to perform the validation of installation certification and recertification.

6.a. OSHA may revoke its recognition of a validation organization if its program either has failed to continue to satisfy the requirements of this Appendix or its letter of recognition, has not been performing the validation functions required by the PSDI standard and Appendix A, or has misrepresented itself in its applications. Before proposing to revoke recognition, the Agency will notify the recognized validation organization of the basis of the proposed revocation and will allow rebuttal or correction of the alleged deficiencies. If the deficiencies are not corrected, OSHA may revoke recognition, effective in 60 days, unless the validation organization requests a hearing within that time.

b. If a hearing is requested, it shall be held before an administrative law judge of the Department of Labor pursuant to the rules specified in 29 CFR Part 1905, Subpart C.

c. The parties shall be OSHA and the recognized validation organization. The decision shall be made pursuant to the procedures specified in paragraphs I.B.8.b.(2) through (4) of this Appendix except that the burden of proof shall be on OSHA to demonstrate by a preponderance of the evidence that the recognition should be revoked because the validation organization either is not meeting the requirements for recognition, has not been performing the validation functions required by the PSDI standard and Appendix A, or has misrepresented itself in its applications.

D. Provisions of OSHA Recognition

Each recognized third-party validation organization and its validating laboratories shall:

1. Allow OSHA to conduct unscheduled reviews or on-site audits of it or the validating laboratories on matters relevant to PSDI, and cooperate in the conduct of these reviews and audits;

2. Agree to terms and conditions established by OSHA in the grant of recognition on matters such as exchange of data, submission of accident reports, and assistance in studies for improving PSDI or the certification/validation process.

II. Qualifications

The third-party validation organization, the validating laboratory, and the employees of each shall meet the requirements set forth in this section of this Appendix.

A. Experience of Validation Organization

1. The third-party validation organization shall have legal authority to perform certification/validation activities.

2. The validation organization shall demonstrate competence and experience in either power press design, manufacture or use, or testing, quality control or certification/validation of equipment comparable to power presses and associated control systems.

3. The validation organization shall demonstrate a capability for selecting, reviewing, and/or validating appropriate standards and test methods to be used for validating the certification of PSDI safety systems, as well as for reviewing judgements on the safety of PSDI safety systems and their conformance with the requirements of this section.

4. The validating organization may utilize the competence, experience, and capability of its employees to demonstrate this competence, experience and capability.

B. Independence of Validation Organization

1. The validation organization shall demonstrate that:

a. It is financially capable to conduct the work;

b. It is free of direct influence or control by manufacturers, suppliers, vendors, representatives of employers and employees, and employer or employee organizations; and

c. Its employees are secure from discharge resulting from pressures from manufacturers, suppliers, vendors, employers or employee representatives.

2. A validation organization may be considered independent even if it has ties with manufacturers, employers or employee representatives if these ties are with at least two of these three groups; it has a board of directors (or equivalent leadership responsible for the certification/validation activities) which includes representatives of the three groups; and it has a binding commitment of funding for a period of three years or more.

C. Validating Laboratory

The validation organization's laboratory (which organizationally may be a part of the third-party validation organization):

1. Shall have legal authority to perform the validation of certification;

2. Shall be free of operational control and influence of manufacturers, suppliers, vendors, employers, or employee representatives that would impair its integrity of performance; and

3. Shall not engage in the design, manufacture, sale, promotion, or use of the certified equipment.

D. Facilities and Equipment

The validation organization's validating laboratory shall have available all testing facilities and necessary test and inspection equipment relevant to the validation of the certification of PSDI safety systems, installations and operations.

E. Personnel

The validation organization and the validating laboratory shall be adequately staffed by personnel who are qualified by technical training and/or experience to conduct the validation of the certification of PSDI safety systems.

1. The validation organization shall assign overall responsibility for the validation of PSDI certification to an Administrative Director. Minimum requirements for this position are a Bachelor's degree and five years professional experience, at least one of which shall have been in responsible charge of a function in the areas of power press design or manufacture or a broad range of power press use, or in the areas of testing, quality control, or certification/validation of equipment comparable to power presses or their associated control systems.

2. The validating laboratory, if a separate organization from the validation organization, shall assign technical responsibility for the validation of PSDI certification to a Technical Director. Minimum requirements for this position are a Bachelor's degree in a technical field and five years of professional experience, at least one of which shall have been in responsible charge of a function in the area of testing, quality control or certification/validation of equipment comparable to power presses or their associated control systems.

3. If the validation organization and the validating laboratory are the same organization, the administrative and technical responsibilities may be combined in a single position, with minimum requirements as described in E.1. and 2. for the combined position.

4. The validation organization and validating laboratory shall have adequate administrative and technical staffs to conduct the validation of the certification of PSDI safety systems.

F. Certification/Validation Mark or Logo.

1. The validation organization or the validating laboratory shall own a registered certification/validation mark or logo.

2. The mark or logo shall be suitable for incorporation into the label required by paragraph (h)(11)(iii) of this section.

III. Program Requirements

A. Test and Certification/Validation Procedures

1. The validation organization and/or validating laboratory shall have established written procedures for test and certification/validation of PSDI safety systems. The procedures shall be based on pertinent OSHA standards and test methods, or other publicly available standards and test methods generally recognized as appropriate in the field, such as national consensus standards or published standards of professional societies or trade associations.

2. The written procedures for test and certification/validation of PSDI systems, and the standards and test methods on which they are based, shall be reproducible and be available to OSHA and to the public upon request.

B. Test Reports

1. A test report shall be prepared for each PSDI safety system that is tested. The test report shall be signed by a technical staff representative and the Technical Director.

2. The test report shall include the following:

a. Name of manufacturer and catalog or model number of each subsystem or major component.

b. Identification and description of test methods or procedures used. (This may be through reference to published sources which describe the test methods or procedures used.)

c. Results of all tests performed.

d. All safety distance calculations.

3. A copy of the test report shall be maintained on file at the validation organization and/or validating laboratory, and shall be available to OSHA upon request.

C. Certification/Validation Reports

1. A certification/validation report shall be prepared for each PSDI safety system for which the certification is validated. The certification/validation report shall be signed by the Administrative Director and the Technical Director.

2. The certification/validation report shall include the following:

a. Name of manufacturer and catalog or model number of each subsystem or major component.

b. Results of all tests which serve as the basis for the certification.

c. All safety distance calculations.

d. Statement that the safety system conforms with all requirements of the PSDI standard and Appendix A.

3. A copy of the certification/validation report shall be maintained on file at the validation organization and/or validating laboratory, and shall be available to the public upon request.

4. A copy of the certification/validation report shall be submitted to OSHA within 30 days of its completion.

D. Publications System

The validation organization shall make available upon request a list of PSDI safety systems which have been certified/validated by the program.

E. Follow-up Activities

1. The validation organization or validating laboratory shall have a follow-up system for inspecting or testing manufacturer's production of design certified/validated PSDI safety system components and subassemblies where deemed appropriate by the validation organization.

2. The validation organization shall notify the appropriate product manufacturer(s) of any reports from employers of point of operation injuries which occur while a press is operated in a PSDI mode.

F. Records

The validation organization or validating laboratory shall maintain a record of each certification/validation of a PSDI safety system, including manufacturer and/or employer certification documentation, test and working data, test report, certification/validation report, any follow-up inspections or testing, and reports of equipment failures, any reports of accidents involving the equipment, and any other pertinent information. These records shall be available

for inspection by OSHA and OSHA State Plan offices.

G. Dispute Resolution Procedures

1. The validation organization shall have a reasonable written procedure for acknowledging and processing appeals or complaints from program participants (manufacturers, producers, suppliers, vendors and employers) as well as other interested parties (employees or their representatives, safety personnel, government agencies, etc.), concerning certification or validation.

2. The validation organization may charge any complainant the reasonable charge for repeating tests needed for the resolution of disputes.

Appendix D to § 1910.217—Nonmandatory Supplementary Information

This Appendix provides nonmandatory supplementary information and guidelines to assist in the understanding and use of 29 CFR 1910.217(h) to allow presence sensing device initiation (PSDI) of mechanical power presses. Although this Appendix as such is not mandatory, it references sections and requirements which are made mandatory by other parts of the PSDI standard and appendices.

1. General

OSHA intends that PSDI continue to be prohibited where present state-of-the-art technology will not allow it to be done safely. Only *part revolution* type mechanical power presses are approved for PSDI. Similarly, only presses with a configuration such that a person's body cannot completely enter the bed area are approved for PSDI.

2. Brake and Clutch

Flexible steel band brakes do not possess a long-term reliability against structural failure as compared to other types of brakes, and therefore are not acceptable on presses used in the PSDI mode of operation.

Fast and consistent stopping times are important to safety for the PSDI mode of operation. Consistency of braking action is enhanced by high brake torque. The requirement in paragraph (h)(2)(ii) defines a high torque capability which should ensure fast and consistent stopping times.

Brake design parameters important to PSDI are high torque, low moment of inertia, low air volume (if pneumatic) mechanisms, non-interleaving engagement springs, and structural integrity which is enhanced by over-design. The requirement in paragrpah (h)(2)(iii) reduces the possibility of significantly increased stopping time if a spring breaks.

As an added precaution to the requirements in paragraph (h)(2)(iii), brake adjustment locking means should be secured. Where brake springs are externally accessible, lock nuts or other means may be provided to reduce the possibility of backing off of the compression nut which holds the springs in place.

3. Pneumatic Systems

Elevated clutch/brake air pressure results in longer stopping time. The requirement in paragraph (h)(3)(i)(*C*) is intended to prevent degradation in stoping speed from higher air pressure. Higher pressures may be permitted, however, to increase clutch torque to free "jammed" dies, provided positive measures are provided to prevent the higher pressure at other times.

4. Flywheels and Bearings

Lubrication of bearings is considered the single greatest deterrent to their failure. The manufacturer's recommended procedures for maintenance and inspection should be closely followed.

5. Brake Monitoring

The approval of brake monitor adjustments, as required in paragraph (h)(5)(ii), is not considered a *recertification*, and does not necessarily involve an on-site inspection by a representative of the validation organization. It is expected that the brake monitor adjustment normally could be evaluated on the basis of the effect on the safety system certification/validation documentation retained by the validation organization.

Use of a brake monitor does not eliminate the need for periodic brake inspection and maintenance to reduce the possibility of catastrophic failures.

6. Cycle Control and Control Systems

The PSDI set-up/reset means required by paragraph (h)(6)(iv) may be initiated by the actuation of a special momentary pushbutton or by the actuation of a special momentary pushbutton and the initiation of a first stroke with two hand controls.

It would normally be preferable to limit the adjustment of the time required in paragraph (h)(6)(vi) to a maximum of 15 seconds. However, where an operator must do many operations outside the press, such as lubricating, trimming, deburring, etc., a longer interval up to 30 seconds is permitted.

When a press is equipped for PSDI operation, it is recommended that the presence sensing device be active as a guarding device in other production modes. This should enhance the reliability of the device and ensure that it remains operable.

An acceptable method for interlocking supplemental guards as required by paragraph (h)(6)(xiii) would be to incorporate the supplemental guard and the PSDI presence sensing device into a hinged arrangement in which the alignment of the presence sensing device serves, in effect, as the interlock. If the supplemental guards are moved, the presence sensing device would become misaligned and the press control would be deactivated. No extra microswitches or interlocking sensors would be required.

Paragraph (h)(6)(xv) of the standard requires that the control system have provisions for an "inch" operating means; that die-setting not be done in the PSDI mode; and that production not be done in the "inch" mode. It should be noted that the sensing device would be by-passed in the "inch" mode. For that reason, the prohibitions against die-setting in the PSDI mode, and against production in the "inch" mode are cited to emphasize that "inch" operation is of reduced safety and is not compatible with PSDI or other production modes.

7. Environmental Requirements

It is the intent of paragraph (h)(7) that control components be provided with inherent design protection against operating stresses and environmental factors affecting safety and reliability.

8. Safety system

The safety system provision continues the concept of paragraph (b)(13) that the probability of two independent failures in the length of time required to make one press cycle is so remote as to be a negligible risk factor in the total array of equipment and human factors. The emphasis is on an integrated total system including all elements affecting point of operation safety.

It should be noted that this does not require redundancy for press components such as structural elements, clutch/brake mechanisms, plates, etc., for which adequate reliability may be achieved by proper design, maintenance, and inspection.

9. Safeguarding the Point of Operation

The intent of paragraph (h)(9)(iii) is to prohibit use of mirrors to "bend" a single light curtain sensing field around corners to cover more than one side of a press. This prohibition is needed to increase the reliability of the presence sensing device in initiating a stroke only when the desired work motion has been completed.

"Object sensitivity" describes the capability of a presence sensing device to detect an object in the sensing field, expressed as the linear measurement of the smallest interruption which can be detected at any point in the field. Minimum object sensitivity describes the largest acceptable size of the interruption in the sensing field. A minimum object sensitivity of one and one-fourth inches (31.75 mm) means that a one and one-fourth inch (31.75 mm) diameter object will be continuously detected at all locations in the sensing field.

In deriving the safety distance required in paragraph (h)(9)(v), all stopping time measurements should be made with clutch/brake air pressure regulated to the press manufacturer's recommended value for full clutch torque capability. The stopping time measurements should be made with the heaviest upper die that is planned for use in the press. If the press has a slide counterbalance system, it is important that the counterbalance be adjusted correctly for upper die weight according to the manufacturer's instructions. While the brake monitor setting is based on the stopping time it actually measures, i.e., the normal stopping time at the top of the stroke, it is important that the safety distance be computed from the longest stopping time measured at any of the indicated three downstroke stopping positions listed in the explanation of Ts. The use in the formula of twice the stopping time increase, Tm, allowed by the brake monitor for brake wear allows for greater increases in the downstroke stopping time than occur in normal stopping time at the top of the stroke.

10. Inspection and Maintenance. [Reserved]

11. Safety System Certification/Validation

Mandatory requirements for certification/validation of the PSDI safety system are provided in Appendix A and Appendix C to this standard. Nonmandatory supplementary information and guidelines relating to certification/validation of the PSDI safety system are provided to Appendix B to this standard.

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March 14, 1988

Part IV

Department of Transportation

Federal Aviation Administration

14 CFR Parts 61, 63, 65, 121, and 135
Anti-Drug Program for Personnel Engaged in Specified Aviation Activities; Notice of Proposed Rulemaking

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 61, 63, 65, 121, and 135

[Docket No. 25148, Notice No. 88-4]

Anti-Drug Program for Personnel Engaged in Specified Aviation Activities

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This notice proposes rules to require domestic and supplemental air carriers, commercial operators of large aircraft, air taxi operators, commercial operators, certain contractors to these operators, and air traffic control facilities not operated by FAA or the U.S. military to have an anti-drug program for employees who perform sensitive safety and security-related functions. Testing under these proposed rules would be conducted prior to employment, periodically, randomly, after an accident and based on reasonable cause. This notice also requests comments on how to provide employers with the maximum flexibility in designing company-specific programs. In addition, these proposed rules seek comments on a regulatory alternative for the rehabilitation to be offered to employees. The proposed rules are needed to prohibit the presence of a prohibited drug in an employee's system at any time. The proposed rules are intended to ensure a drug-free aviation environment and to eliminate drug abuse in commercial aviation.

DATE: Comments must be received on or before June 13, 1988. The FAA is considering holding a public hearing on this proposal.

ADDRESS: Send or deliver comments on this notice in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-204), Room 915G, Docket No. 25148, 800 Independence Avenue, SW., Washington, DC 20591. Comments must be marked Docket No. 25148. Comments may be examined in the Rules Docket between 8:30 a.m. and 5 p.m. on weekdays, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Dr. Robert S. Bartanowicz, Assistant Manager, Safety Regulations Division (APR-200), Office of Program and Regulations Management, Federal Aviation Administration, 800 Independence Avenue, SW., Washington DC 20591. Telephone (202) 267-9679

SUPPLEMENTARY INFORMATION:

Comments Invited

This notice of Proposed Rulemaking (NPRM) is issued under the Federal Aviation Administration's (FAA) policy of soliciting public participation in rulemaking proceedings. Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Communications should identify the regulatory docket or notice number and be submitted in duplicate to the address above. All communications received on or before the closing date for comments will be considered by the Administrator before taking further rulemaking action. Persons wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must submit with those comments a pre-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 25148." The postcard will be dated and time stamped and returned to the commenter. All comments submitted will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket.

Availability of NPRM

Any person may obtain a copy of this NPRM by submitting a request to the Federal Aviation Administration, Office of Public Affairs, Attention: Public Inquiry Center (APA-230), 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-3484. Requests must identify the notice number of this NPRM. Persons interested in being placed on the mailing list for future NPRM's should also request a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedures.

Background

In an attempt to gather information on how the FAA might combat drug and alcohol abuse in both commercial and general aviation, the FAA on December 4, 1986, issued an Advanced Notice of Proposed Rulemaking (ANPRM) No. 86-20, entitled "Control of Drug and Alcohol Use for Personnel Engaged in Commercial and General Aviation Activities" (51 FR 44432; December 9, 1986), inviting comments on drug and alcohol abuse by personnel in the aviation industry and options available for regulatory or other actions in the interest of aviation safety.

The Drug Problem in American Society

Drug abuse constitutes a major societal problem. Statistics have been compiled and reported by the National Institute on Drug Abuse (NIDA) and by media polls, all of which indicate use of drugs such as marijuana to be widespread. While the problem appears to be "youth centered" because the majority of users are in the younger age categories, the problem also exists with older groups. For instance, data from the 1985 NIDA "National Survey on Drug Abuse" based on scientific random sampling and using population projections, indicates the following national results:

1. In the age 18 to 25 category:

(a) Sixty (60) percent reported using marijuana sometime during their life;

(b) Twenty-two (22) percent reported using marijuana within the past month;

(c) Twenty-five (25) percent reported using cocaine sometime during their lifetime; and

(d) Eight (8) percent reported using cocaine within the past month.

2. In the age 26 and over category:

(a) Twenty-seven (27) percent reported using marijuana sometime during their life;

(b) Six (6) percent reported using marijuana within the past month;

(c) Nine (9) percent reported using cocaine sometime during their life; and

(d) Two (2) percent reported using cocaine within the past month.

Because of statistics like these, many members of the public are concerned that the abuse of drugs by others may jeopardize their personal safety. A recently issued special report from the Comptroller General of the United States titled "Controlling Drug Abuse: A Status Report" (1988 GAO Report) states that "Drug abuse in the United States has persisted at a very high level throughout the 1980's. Drug abuse is a serious national problem that adversely affects all parts of our society * * *."

There is widespread public sentiment and belief that persons in safety-sensitive occupations should not be drug abusers. A May-June 1986 national survey conducted by Populous Incorporated of Greenwich, Connecticut, and Decision/Making/Information of McLean, Virginia, showed the following results:

1. 88 percent of the respondents favored testing of airline pilots and air traffic controllers;

2. 85 percent of the respondents favored testing of police and other law enforcement agents; and

3. 81 percent of the respondents favored testing of bus drivers.

The survey indicated that respondents favor testing people who are responsible for the physical safety of others.

Another survey, conducted by American Viewpoint, Inc., on August 6–19, 1986, examined the public's attitude toward drug abuse and drug testing and produced informative results. Specifically, "By a margin of 76 percent—22 percent, Americans agree that the drug crisis today is serious enough for mandatory testing." The American Viewpoint survey used a "forced choice" list and asked which groups should submit to mandatory drug testing. While the generic transportation modes (e.g., railroads, aviation, highways, urban mass transportation, and marine or maritime activities) were not included in the survey, safety-related occupations were at the top of the list. Eighty-four percent of the respondents favor testing of police and firefighters; 81 percent favor testing of armed forces personnel; and 81 percent favor testing of doctors and nurses. Another interesting fact was that 80 percent of the respondents indicate that they would participate in voluntary testing if asked to do so by their employer.

These surveys suggest that the majority of the public is concerned about drug abuse and favors the mandatory testing of persons in certain safety-related occupations.

The Drug Problem in Aviation

The FAA, in its regulatory role, has no evidence to suggest that the aviation community differs significantly from the overall population in terms of drug abuse. The public expects, and is entitled to, a drug-free environment in those aviation activities that involve their personal safety. Allegations that certain air carrier crewmembers have used illegal drugs have raised questions about the overall degree of drug abuse in the industry and whether crewmembers are flying after having used drugs, and thus jeopardizing the personal safety of passengers and others.

The available data indicate that drugs have been a factor in general aviation fatalities, but not in commercial aviation fatalities. These data were presented in tabular form in ANPRM No. 86–20. The updated table, including 1986 statistics, follows:

TABLE 1— DRUGS FOUND IN DECEASED GENERAL AVIATION PILOTS BY CLASSIFICATION 1976–1986 [1]

Year	Deceased Pilots	Legal therapeutic drugs [2]	Legal drugs of abuse [3]	Illegal drugs of abuse [4]
1976	377	1	0	1
1977	394	2	1	1
1978	410	2	2	0
1979	388	4	3	2
1980	384	10	0	3
1981	431	5	2	3
1982	389	2	2	3
1983	412	6	0	3
1984	399	2	1	2
1985	412	9	3	4
1986	380	7	7	6
Total	4,376	50	21	28

Notes:

[1] The presence of drugs in an individual's system may, or may not, have been a factor in a fatal accident. For instance, an individual might have been taking a legal therapeutic drug, but could have been abusing it by taking it at more frequent intervals than prescribed. For this reason, the FAA reports all drugs found in fatalities.

[2] This would include over-the-counter drugs, such as aspirin and diet pills, as well as those drugs prescribed by physicians.

[3] A legal drug of abuse is a drug that may be prescribed by a physician or purchased over-the-counter, but which has properties that may result in psychological or physiological dependencies or addiction.

[4] Illegal drugs of abuse would include drugs such as marijuana and cocaine.

As stated in the ANPRM, "there have not been any fatal accidents involving commercial airline pilots where drugs were shown to be factors."

Additional data has been gathered since the ANPRM was issued. Specifically, regarding cargo-carrying aircraft, a fatal accident with a Gates Learjet, Model 25 took place on March 30, 1983, at Newark International Airport. The accident report revealed that the pilot and copilot had used, or been exposed to, marijuana.

One aviation company (a Part 121 and a Part 135 certificate holder), in its comment on the ANPRM, reports that upon initiation of an unannounced testing program, 2.5 percent of its pilots and 4 percent of its mechanics tested positive for a trace or more of illegal drugs. This was based on a population of 180 pilots and 240 mechanics. Although this data group is small and cannot be considered statistically representative of all pilots and mechanics, it does indicate the presence of illegal drugs and the possibility of drug abuse. Data also were provided by some members of the airline industry regarding pre-employment drug screening. These data, however, do not distinguish between specific occupational categories of employees (e.g., pilots, baggage handlers, etc.). The data show that the number of positive tests range from 4.2 percent to 20 percent and that some individual geographic locations reported a positive test range of 25 percent to 30 percent.

In February 1987, the FAA began performing drug tests in connection with periodic medical examinations required of certain sensitive safety and security-related agency employees. As of March 3, 1988, 21,983 samples have been tested pursuant to the periodic testing program. Specimens for 35 employees have been determined to include one or more illegal drugs. In addition, the Department implemented its employee random drug testing program on September 8, 1987. As of February 26, 1988, DOT has conducted 1,191 urinalysis tests pursuant to its random drug testing program for DOT employees occupying critical sensitive safety and security-related positions. Eight employees have tested positive for illegal drugs. These employees are currently in counseling or rehabilitation programs and have been relieved of their critical safety duties pending successful completion of these

programs. In addition, since the inception of the DOT program, four employees out of six have tested positive for illegal drugs as a result of reasonable cause drug testing.

It is acknowledged that the above data are sparse and are not conclusive. There are no data indicating drug abuse by Part 121 and Part 135 crewmembers or other employees involved in fatal or major aircraft accidents. Conversely, fatal accidents cannot be the only basis to judge whether there is a problem with drug abuse. For example, there is no way to gauge how many near accidents there are due to pilot impairment. The issue is problematic. A responsive anti-drug program would provide the public with the necessary protection while enabling the FAA to achieve a statistically valid representation and understanding of the Problem. The FAA cannot wait for a problem to reveal itself before acting to protect the public from the problem's consequences.

The absence of more detailed data may be due to several factors. First, the use of drugs is something that persons may go to great lengths to conceal. For commercial pilots, the discovery of their drug use by supervisors or other crewmembers could result in loss of jobs, and individuals would be careful to conceal drug use for fear of detection. The same economic rationale (loss of jobs) would hold true for others who earn their living through aviation. Second, detection is not easy in some situations, such as those of some commercial pilots who may not see their supervisors on a regular basis. In the case of pilots who operate at numerous locations full-time surveillance by the FAA or others is neither practical nor economically feasible. Third, even when there is supervision or surveillance of individuals, not everyone, including fellow crewmembers, is trained to detect drug abuse by observing behavioral or performance cues. As one commenter to the ANPRM states "We have been surprised by the persons who have tested positive. Employees whose personal habits, appearances, and lifestyles appear to be above reproach have tested positive for drugs and subsequently admitted their use." Fourth, it is possible that there are individuals who may serve as "enablers" by tolerating or covering for a person with a drug problem, especially if that person might lose his or her job and suffer adverse financial consequences. Finally, the FAA does not dispute the professionalism of the vast majority of commercial and general aviation pilots and other professionals in aviation and their commitment to a drug-free aviation environment. However, the current situation as it involves drugs can be likened to the 1970's when alcoholism among airline pilots was sometimes ignored or denied. Only after the industry and the affected individuals admitted that a problem existed was the issue faced and action taken.

Comments to the ANPRM

The ANPRM encouraged comments, through a series of questions, to assist the FAA with information gathering in pertinent areas to ensure an aviation environment free of alcohol and drugs. Some of the topics addressed in the ANPRM included:

1. To what extent alcohol and drugs are abused by occupational categories;
2. Whether the consumption of legal drugs is sufficiently monitored;
3. How off-duty alcohol use impacts aviation safety;
4. What kinds of mandatory alcohol and drug testing programs should be required, if any;
5. Who should be tested;
6. Whether regulations should be extended to safety-related occupations not presently covered by the FAA's drug and alcohol rules;
7. What should be included in an Employee Assistance Program;
8. Under what circumstances testing should be conducted based on "reasonable suspicion;"
9. By what means the FAA can achieve an alcohol- and drug-free environment throughout the industry; and,
10. Whether the FAA should request legislation to gain access to the National Driver Register to identify aviation personnel who have convictions for driving under the influence of alcohol or drugs.

The responses to the ANPRM were numerous; over 650 comments were received. Due consideration has been given to all comments received. The information and views received in response to the notice are summarized below.

General Summary of Comments Received

For purposes of general discussion, the comments may be grouped into three categories: Aviation industry organizations and members; Aviation labor organizations and members; and, other commenters. Comments by individuals have been assigned to one of the three categories based on an analysis of the comment. The FAA has noted both the common themes expressed by members of these groups and the many variations on, and exceptions to, these themes. The major themes that were addressed most frequently show that: (1) The vast majority of commenters oppose random drug testing but favor testing based on reasonable suspicion or following accidents; (2) a large majority believe that more thorough enforcement of present regulations will eliminate a minimal drug problem; (3) many commenters urge the FAA to endorse employee assistance programs (EAP's) in lieu of chemical testing programs; and (4) a significant number question the constitutionality of testing for drugs and, in particular, random testing. Basically, all three groups of commenters are against drug and alcohol abuse in the aviation environment and are committed to safety. Whatever differences exist among the groups are principally based on the means by which to best accomplish this objective.

Industry

Among those participating in the comment process are: Air Transport Association of America (ATA); National Business Aircraft Association, Inc. (NBAA); Northwest Airlines, Inc.; American Cyanamid Co.; Continental Airlines, Inc.; Regional Airline Association; ERA Helicopters, Inc., DHL Airways, Inc./Worldwide Express; Federal Express Corporation; and National American Wholesale Grocers' Association. Aviation industry organizations and their members generally believe there is a problem and favor rulemaking. One exception to this near consensus of organizations that favor rulemaking is the position taken by the NBAA, representing over 2,900 companies who operate approximately 5,500 aircraft. NBAA bases its opposition to rulemaking on what it considers to be the debatable constitutionality of regulation in this area. The commonly held position of the other industry commenters, however, is best reflected by ATA, representing a number of the air carriers that carry the majority of air travelers. ATA endorses regulatory action.

ATA submitted, along with its comments, a draft regulatory proposal addressing some of the issues on which comments were requested by the ANPRM. ATA advocates testing before employment, after an accident or incident, and based on "reasonable suspicion." Although ATA itself favors the use of random drug testing, member carriers differ on whether this testing should be mandated or expressly permitted. One such member carrier, for example, believes that the Government should set minimum standards for such

categories as mandatory random drug testing. On most other issues, the carrier concurs with the ATA position.

Another issue where the aviation industry organizations are in agreement is in extending the categories of employees to be tested. These organizations want certificated and noncertificated crewmembers, mechanics, and any other employees whose duties could affect the safety of aviation to be tested—generally, those employees participating in operations, maintenance, engineering, and aircraft servicing activities.

ATA believes that there is little similarity between issues and problems surrounding the control of drugs and alcohol usage in the airline industry as compared to general aviation. This organization believes that each should be addressed in a separate rulemaking proceeding; others outside the organization, (e.g., Federal Express) agree with this position.

A number of industry organizations expressed concerns about EAP's. Several carriers believe that EAP's for drug abuse should not be mandated by the FAA; one association suggests that requiring the establishment of EAP's is not an appropriate function of the FAA.

While concurring with the overall views of the industry on EAP's, one carrier suggests that if the FAA does mandate the EAP's, there should be a stipulation that would require limiting the availability of these programs to only those employees who seek treatment prior to becoming involved in a rule violation. For example, an individual who tests positive for a prohibited drug, as a result of testing based on an observed violation of a specific rule or prohibition, should not benefit from the protection of an EAP. For the most part, ATA members believe that participation in EAP's should be limited to only those employees who admit voluntarily to being drug or alcohol dependent.

The issue of whether the FAA should request legislation to exchange information with the National Driver Register (NDR) receive mixed comments. This exchange would identify those pilots with convictions for driving under the influence of drugs or alcohol. The following breakdown describes the position of the commenters: (1) Many express no views on the subject; (2) others support the exchange; and (3) one opposes access to NDR information entirely. Another commenter opposes access to these records by the FAA, but supports records being made available only to employers for pre-employment review of applicants.

Labor

A good cross section of the labor organizations, professional associations, and their membership participated in the public comment process. Among those responding were: Transport Workers Union of America, AFL–CIO; Air Line Pilots Association; Association of Flight Attendants, AFL–CIO; Brotherhood of Railway, Airline and Steamship Clerks, Freight Handlers, Express and Stations Employees, AFL–CIO–CLC; Union of Flight Attendants; Aircraft Owners and Pilots Association; Allied Pilots Association; International Association of Machinists and Aerospace Workers; and International Brotherhood of Teamsters, Chauffeurs, Warehousemen, and Helpers of America.

With notable exceptions, the aviation labor organizations generally contend that there are sufficient existing regulations to address the problem of drug abuse. One such organization, representing a large membership of both certificated and noncertificated employees, supports FAA's goal to achieve a drug-free environment in commercial aviation but believes that this goal can be more readily achieved by more thorough enforcement of the present FAA regulations.

Many commenters strongly oppose any program for mandatory random or across-the-board testing. These commenters base their views on the lack of statistics to warrant such "drastic" measures. They acknowledge that an airman who is impaired while on duty creates a potential hazard but emphatically submit that no concrete data of any such abuse in commercial aviation exist. Others in this group concur with that position. They believe that crewmembers are already subject to testing under current Parts 65 and 91 of the Federal Aviation Regulations (FAR) and believe that these provisions are adequate. To substantiate their position, they cite that there is no recorded incident or accident attributable to drug or alcohol impairment involving a commercial cockpit crewmember.

While categorically opposing random drug testing, one major labor association could, however, support testing under the following circumstances: (1) Preemployment evaluations; (2) testing for probable cause; (3) testing after an accident or incident, and (4) random testing as part of aftercare monitoring.

If testing is mandated, several commenters support expanding coverage to all airline employees, the opinion being that personnel working in operations, maintenance, scheduling, loading, controlling, and management all have an impact on safety.

Typically, the labor organizations question the accuracy of methods proposed for testing. Their concerns center around the various drug tests' purported "high" error rate, which could result in suspension and stigmatization of crewmemers accused after less-than-accurate results. The representatives believe that such testing would not provide assurances of lack of impairment or otherwise contribute to the safety of the flying public. Some organizations suggest that they already have successful systems for making management aware of crewmembers suspected of impairment.

The issue of regulating off-duty drug use received numerous comments. Most commenters oppose any attempt to regulate the off-duty conduct of aviation personnel by amending the rules. Nevertheless, one large organization believes strongly that the use of illicit drugs, on or off duty, must be "strictly forbidden."

Most agreement is reached in the area of EAP's. Commenters from labor unequivocally support such programs in lieu of random chemical testing for drugs. Many commenters suggest the need for improving and standardizing existing EAP's. Others believe that labor must actively participate in EAP's to ensure that the programs work well to assist employees with drug problems. Primarily, however, commenters believe that if the programs are to succeed, then the EAP's must be both comprehensive and nonpunitive.

Other Commenters

The last category of commenters encompasses an extensive and varied group: Private citizens, some unaffiliated but more often members of aviation organizations; other governmental agencies; industrial relations firms; public advocacy groups; organizations representing general aviation firms; and recreational pilot associations. This group tends to have many of the same concerns, often with corresponding responses. A substantial number from this group believe that the FAA should make every reasonable effort to enforce present regulations, which they assert adequately prohibit personnel from acting as crewmembers while under the influence of drugs. These commenters believe that the FAA should resort to other measures addressed in the ANPRM only if enforcement of present regulations proves to be ineffective.

A significant number of these commenters share views similar to those of labor. For example, many from this

group contend that there is no concrete data available to indicate widespread illegal drug and alcohol abuse within the aviation community. They believe that aviation is being unfairly singled out over other transportation modes who license operators of vehicles.

With few exceptions, this large group opposes random and scheduled testing for drugs and alcohol and views it as bordering on intrusive and unconstitutional action.

Comments received from commercial pilots cite that there has never been an accident involving commercial aviation attributable to either drugs or alcohol. Moreover, the commenters recount that this profession is more closely monitored than any other profession in the country. This belief is founded on requirements set for commercial pilots that include frequent proficiency tests and examinations.

Many commenters echo the perception that there is no evidence to support testing, especially for general aviation pilots who conduct only personal, noncommercial flights. Consequently, the financial burden that random and scheduled testing would impose on general aviation is seen as excessive. Also problematic for some commenters is whether the general aviation population, which lacks geographical concentration, would be readily accessible for testing.

There is, however, abundant support among this group to test for probable cause, after an accident, before employment, and following participation in a rehabilitation program.

Opinions vary on which occupations to include for testing. One association favors inclusion of anyone in contact with, or having access to, aircraft. This group would include flight crewmembers, mechanics, security personnel, and baggage handlers. However, this same association supports exclusion from testing for management personnel.

Another commenter, with considerable experience in airport operations, relates that he has observed extensive alcohol and drug abuse within operations and maintenance departments. The abuse he witnessed extends to top-level management personnel. Therefore, the commenter proposes that all individuals be subject to testing and that the tests include random, scheduled, and pre-employment testing to effectively eliminate the problem.

A few commenters tend to support a strong Federal role. They firmly believe it is their constitutional right, as members of the traveling public, to have their safety protected, by whatever means necessary, from persons whose judgment and motor skills may be impaired by the use of alcohol or drugs.

Most commenters, however, dismiss the "by whatever means necessary" approach and insist that the FAA deal with the drug-abuse problem in a lawful, prudent, and humane manner.

Commenters predominantly oppose exchanging information with the NDR. Many base their objection on the lack of correlation between highway actions and subsequent flying actions. Also, commenters caution the FAA on the possibility of misunderstanding and misuse of this information. Several commenters, however, urge the FAA to seek legislative authority to use the NDR to identify aviation personnel whose driver's licenses have been suspended or revoked for drug- or alcohol-related offenses. They contend that substance abusers, in general, will act irresponsibly in more than one situation. Furthermore, they propose that off-duty alcohol and drug use can affect aviation safety. Still, most commenters vehemently oppose extending the regulations to monitor off-duty activities. Some argue that no data has surfaced to connect off-duty use with impaired on-duty performance. Other commenters cite the absence of a test to accurately measure drug-induced impairment.

Notably, the issue that received near-unanimous support was in the area of EAP's. Those commenters that addressed this subject indicate that EAP's are the most effective means to combat drug and alcohol problems. One professional association, although taking no position for or against drug testing, states that drug testing, by itself, will not control substance abuse in the long term.

A substantial number of commenters are not convinced of the accuracy of drug testing. They perceive the testing to be unreliable and encourage the FAA to require EAP's, citing the programs' success within the private sector.

A good many commenters from all three categories share and appreciate the FAA's concern that the general problems of drug and alcohol abuse in our society may spill over into the aviation system and, therefore, impact air safety. As the comments reflect, the issue no longer is simply whether it is reasonable to implement substance abuse programs; rather, the central issue is how such programs should be constructed to operate fairly and effectively.

Overview of the Proposed Anti-Drug Program

The FAA recognizes the complex issues and burdens involved in developing effective anti-drug programs. The FAA also recognizes the serious impact of the proposed program and the concerns of those who are subject to the proposed rule. Conversely, the public interest in a safe and drug-free aviation environment is paramount and will not be overlooked by the FAA. To meet the statutory mandate to promote safety of flight of civil aircraft in air commerce, the FAA must engage in a preventive program to combat drug use and abuse in aviation activities.

The FAA is proposing that employers develop a drug program for sensitive safety and security-related employees: All scheduled and nonscheduled Part 121 and Part 135 certificate holders; those entities that, by contract, provide employees who perform sensitive safety and security-related functions for the Part 121 and Part 135 certificate holders and other aviation operators; including those entities that employ individuals in the capacity of aviation security screeners (also referred to as "airport pre-departure screeners") and control tower operators. Certain persons who conduct operations for compensation or hire who are currently exempt from the requirements of Part 135 would be required to implement, or participate in, an anti-drug program. These individuals conduct the following types of operations: Student instructions; nonstop sightseeing flights that begin and end at the same airport and are conducted within 25 miles of that airport; ferry or training flights; aerial work operations, including crop dusting, seeding, spraying, bird chasing, banner towing, aerial photography or survey, fire fighting, helicopter operations in construction or repair, and powerline or pipeline patrol operations, or similar types of patrol approved by the Administrator; sightseeing flights conducted in hot-air balloons; nonstop flights conducted within 25 miles of the takeoff airport carrying persons for intentional parachute jumps; specified helicopter flights conducted within 25 miles of the takeoff airport; rotorcraft external-load operation pursuant to Part 133; and the carriage of candidates in Federal elections. The FAA invites comments on the proposed range of covered employees. The FAA is not considering covering persons conducting the following types of operations under § 135.1 (b)(8) or (b)(9): Foreign civil aircraft navigated within the United States pursuant to Part 375; and

emergency mail service under section 405(h) of the Federal Aviation Act of 1958. For the purposes of this notice, and the proposed rule, the persons who conduct operations under Part 135 and who would be required to implement a drug program under the proposed rules have been defined as "operators."

These employers would test employees who are required to hold a certificate issued by the FAA or who perform specified sensitive safety and security-related functions, either directly or indirectly, for those employers. These employees would include the following occupational groups: Pilots; flight engineers; flight navigators; aircraft dispatchers; mechanics: repairmen; parachute riggers; ground instructors; flight attendants; security coordinators, and aviation security screeners (airport pre-departure screeners); individuals who perform air traffic control duties who are not employed by, or under contract to, the FAA or by the U.S. military.

Under the proposed anti-drug program, the employer would be required to conduct the following types of testing: Pre-employment testing for all applicants for sensitive safety and security-related jobs; periodic testing for those employees required by Federal Regulation to have periodic medical examinations; random testing; post-accident testing for employees whose performance may have contributed to an accident; and testing based on reasonable cause.

The proposed rule would not require that an employer's anti-drug program be effective immediately. Employers would have 120 days from the effective date in which to develop and submit a proposed anti-drug plan acceptable to the Administrator. The FAA would review an employer's proposed anti-drug program for compliance with the criteria and requirements contained in the proposed appendix to Part 121. The FAA's silence would be tantamount to approval because the FAA will respond only if the plan is not acceptable. The plan must be implemented 180 days after the deadline for submitting the program to the FAA. Thereafter, periodic progress reports must be sent to the FAA according to a predetermined schedule. Employers would be free to submit amendments to their anti-drug programs as warranted. The FAA would respond within 120 days following submission of the amendment if the plan is not "acceptable"; otherwise the amendment would be considered approved. In the final rule, the FAA would specify which of its organizational elements would be responsible for reviewing all plans and reports. FAA also would be able to order an employer to amend an approved program if it is determined that safety and the public interest require it. While the FAA would not prohibit employers from taking independent actions beyond those required by the proposed rule, such actions would not be authorized by the FAA. Additional or more stringent procedures, therefore, would not be considered as part of an employer's approved anti-drug program.

The program would be composed of two distinct parts: The first part is testing for drugs to detect users and to deter future use; the second part is an ongoing and active "preventive" program that would offer EAP services including rehabilitation, education, and training. The two parts of the program are complementary and mutually supportive because the problem of drug abuse is attacked from all directions. Minimum requirements for rehabilitation, education, and training have been included in the proposed rule.

It must be recognized that an EAP, by itself, would not seriously deter drug use and abuse. To do so, it must be accompanied by the threat of drug testing and detection to encourage voluntary referral. An example of a voluntary EAP, unsupported by drug testing, which did not deter drug usage includes a program instituted by the Coast Guard.

From 1980 to 1982 the Coast Guard Drug Exemption Program encouraged uniformed personnel (members) to seek rehabilitation by voluntary disclosure of past illegal drug use. A Commanding Officer's grant of a one-time exemption, following disclosure, precluded disciplinary action and any administrative action other than an honorable discharge. Rehabilitation for members who were retained included counselling, education, and inpatient treatment at U.S. Navy facilities for members who were diagnosed as drug dependent. Users detected without voluntary disclosure were subject to disciplinary or adverse administrative action.

The Drug Exemption Program failed to deter usage. The Coast Guard cancelled the program and initiated a drug testing program that resulted in a decrease in the number of routine confirmatory urinalysis tests from 103 per 1,000 in 1983 to 29 per 1,000 in 1986. Based on this information, the FAA believes that the threat of detection through testing would help reduce the incidence of drug use and motivate those who are drug users to seek help through either EAP's or other referral sources.

The proposed anti-drug program is intended to create a drug-free aviation environment. Therefore, an individual may not use illicit drugs at any time, even off duty. An individual who uses drugs off duty and is tested for drug use upon returning to duty and is found to have such drugs in his or her system would violate this proposed rule even if there is no basis for concluding that an individual is impaired on the job. The absolute prohibition against drug use is based on fundamental safety concerns about the effects of possible impairment on the performance of an individual who uses illicit drugs or abuses illicit drugs. Drug use either on or off duty is prohibited since certain drugs can remain in a person's system long after use and may impair performance. It is clearly in the public interest to ensure that individuals impaired by drug use or abuse are identified before they jeopardize air safety. The FAA considers impairment due to drug use or abuse a serious safety problem because neither the individual nor his or her colleagues may be able to detect the subtle and varying degrees of impairment to motor skills and judgment that are critical to aircraft operation or performance of sensitive safety and security-related duties.

It is important to emphasize that this notice is not intended to alter or contradict the current restrictions contained in the Federal Aviation Regulations (FAR) regarding the use of drugs in aviation-related activities. The FAA has always recognized that even if over-the-counter or prescription drugs are used according to instructions or a physician's orders, these drugs, nevertheless, may impair an individual's job performance or adversely affect critical safety functions. Although the FAA will not require an employer to test for over-the-counter or prescription drugs, section 91.11 will continue to provide that a crewmember may not perform functions for an employer while using any drug that affects the person's faculties in any way contrary to safety.

The question of alcohol abuse was raised in the ANPRM to determine what additional actions might be required, if any, to address the overall issue. After review of the current regulations dealing with the use of alcohol, §§ 61.15, 61.16, 63.12, 63.12a, 65.12 and 91.11 of the FAR, the FAA determined that these regulations are clear and are understood by both employees and employers. In the case of alcohol, an individual would be allowed to consume alcohol off duty as long as he or she complies with

§ 91.11 of the FAR. The FAA is not proposing any changes in this NPRM regarding the use of alcohol. In addition, the idea of testing for alcohol using urinalysis was rejected based on the inadequacies of urinalysis as a truly acceptable method of testing for the presence of alcohol. The preferable method for testing for alcohol is either a breath measurement device or drawing blood from the individual, the latter method preferred for scientific accuracy. Therefore, if tests were run for alcohol, two different types of tests (breath measurement and blood alcohol concentration) would have to be conducted. This would greatly complicate the process as well as increase costs. Also, the blood test method generally is considered an invasive procedure and would not be favorably received by those being tested. Finally, it is easier to identify someone who abuses alcohol and reports for work impaired than someone who uses drugs. As such, the issue of testing for alcohol was removed from consideration in the rulemaking proceeding. FAA will continue to review the effectiveness of its alcohol abatement programs.

Who Would Establish an Anti-Drug Program

The major issue in determining who should be required to establish an anti-drug program centered around the issue of public trust. The FAA believes that those aviation entities who operate for compensation or hire and who provide services to the public clearly are dependent on public trust and should take steps toward ensuring a drug-free aviation environment. The ANPRM solicited comments regarding other activities, including general aviation operations. While these activities require FAA certification, the FAA believes that they are not subject to the same degree of public trust. In the case of general aviation pilots, the FAA determined that they are private individuals, engaged in a private activity, and, thus, did not fall within the public trust criterion. It is recognized that the exclusion of general aviation pilots will spark controversy, as the FAA acknowledged in the ANPRM, because the major evidence of drug abuse in aviation has been attributed to the general aviation sector. However, at this time the FAA does not propose requirements for general aviation pilots.

Based on these considerations, the FAA is proposing that all scheduled and nonscheduled Part 121 and Part 135 certificate holders, "operators" as defined in this notice, and contractors whose employees perform specific sensitive safety and security-related functions for a certificate holder would be required to establish an anti-drug program. This would include those entities who employ individuals to perform the functions of control tower operators and aviation security screeners. The FAA recognized that nonscheduled Part 135 certificate holders and "operators" as defined in this notice may find it difficult to incorporate any anti-drug program because they only have a small number of employees, are self-employed, or operate in remote locations. The FAA invites comments as to what methods might be used to facilitate the inclusion of small entities in the program and whether there are special considerations FAA should take into account in requiring small entities to develop and implement a program. Commenters who believe that the rule should not cover small entities, either in whole or in part, should explain the basis for their views and describe how they would define small entity for this purpose. The proposed rule calls for all employers, including small operators, to file a drug testing plan with the FAA which describes the details of the anti-drug program. In the case of small operators, they may wish to explore the possibility of working with local drug testing programs or with larger certificate holders who might include them in their anti-drug program.

Substances For Which Testing Must Be Conducted

The FAA would require that an employer test for the five most widely abused drugs. These drugs are cocaine, marijuana, opiates, phencyclidine (PCP), and amphetamines. The proposed rule would not prohibit employers from testing for certain other drugs of abuse. The FAA invites comments as to which additional drugs, if any, should be included. Commenters also should provide cost and benefit data regarding additional drug groups.

Who Would Be Tested

The decision regarding who would be tested under the proposed rules was based on those commercial occupations that have the greatest responsibility for safety. The FAA determined that certain individuals employed by Part 121 and Part 135 certificate holders, "operators" as defined in this notice, and other entities who provide contractual services to these employers have such a responsibility and should be tested. Based on safety considerations, the FAA is proposing that all certificated airmen who are required to perform key safety functions should be included in an anti-drug program. The fact that the FAA requires certification of these individuals demonstrates that the occupation requires specific knowledge and skills which are critical to safe aircraft operation. Individuals in this category are:

Pilots, flight engineers, flight navigators, aircraft dispatchers, mechanics, repairmen, parachute riggers, ground instructors, and control tower operators. Noncertified individuals that would be included in an anti-drug program are flight attendants and aviation security screeners and security coordinators. The flight attendants are included because they perform functions sensitive safety and security-related enough to warrant inclusion. Likewise, employees responsible for aviation security are included based on the requirement for vigilance and attention to detail. Consideration was also given to including employees in other occupational categories who might directly or indirectly affect safety, including aircraft servicing personnel, airport firefighters, police and others, but the FAA concluded that these employees do not perform functions senstive safety and security-related enough to warrant inclusion. In the case of personnel exercising the privileges of the Control Tower Operator (CTO) certificate, the FAA determined that those non-Federal entities that operate control towers should have an anti-drug program for personnel performing CTO duties. Excluded from this requirement would be: FAA employees; private employees in FAA contract towers; active-duty, military CTO holders; and civilian CTO holders employed by the U.S. military. To the extent this group of excluded CTO holders would be covered by the drug testing programs already in place by their employers, they would not be covered by this proposal. The list of employees subject to testing under this proposed rule could be changed based on further information and data gathered during the comment period. Comments are requested on how FAA should define sensitive safety and security-related for purposes of this proposal and whether this definition should include non-certificated, individuals, such as flight attendants, aviation security screeners, and security coordinators. Commenters addressing these issues should provide empirical evidence to support their comments.

Goals of Drug Testing

The overall goal of drug testing is to foster a drug-free aviation environment which merits public confidence. Drug

testing serves as a significant deterrent to drug abuse by identifying users or forcing them to seek help based on a fear of detection through drug testing. Reporting the results of these programs would enable the FAA to collect statistically valid and representative data on the extent of drug abuse. In turn, this data would enable the FAA to assist the industry in its rehabilitation, education, training, and efforts to combat drug abuse.

When Testing Would Be Conducted

There are five basic situations when testing would be conducted: before employment, periodically, after an accident, randomly, and based on reasonable cause. The five situations involve different circumstances which form a part of a deterrent or anti-drug prevention program.

1. Preemployment testing would be required of all applicants for specified sensitive safety and security-related positions. The purpose of testing applicants is twofold: One, it would convey a clear message that the employer is serious about establishing and maintaining a drug-free environment; and two, it would help identify those who are either addicted to or so dependent upon drugs that they cannot abstain from drug use. All screens that produce positive results for drugs would be confirmed using a superior method of testing as specified in proposed Appendix I to Part 121. Applicants would be informed that tests will be conducted to determine the presence of drugs. The effectiveness of preemployment testing is flawed to some extent because individuals can avoid detection by abstinence. However, data received in response to the ANPRM indicates that preemployment testing in the air carrier industry still reveals positive test results from some selected carriers. As such, preemployment testing provides a valuable service in the selection of employees.

The FAA specifically requests comment on the proposed requirements that the certificate holder keep no records of an application for employment that has been withdrawn because of a failed drug test and on the proposed requirement that the certificate holder not disclose the results of the test to any other person. We have made these proposals because we believe they are appropriate policies for the implementation of an effective and non-punitive anti-drug program. Comments are invited to the extent to which these proposals are necessary or justified.

2. Periodic testing would be conducted during required physical examinations. Employees who are required by regulation to have periodic medical examinations would be advised that urine specimens submitted during the examinations would be subjected to testing for drugs. Those specimens would be collected and handled in accordance with chain-of-custody procedures. Although advance notice of periodic testing may enable drug users to avoid detection through abstinence, periodic testing is an important component of an effective anti-drug program. The FAA invites comments on alternatives to the proposed periodic testing requirement, such as randomly selecting only a portion of the samples for testing.

3. Random testing is expected to be the primary deterrent method in the anti-drug program. Random testing avoids potential bias toward and selective harassment of an employee because every employee has an equal chance for selection at any time. Random selection is usually accomplished through scientifically accepted methods such as the use of a random number table or computer-based, random number generator. Both methods select individuals by matching these random numbers against an employee's social security number or payroll account number.

With random testing, abstinence is the only way to avoid the risk of detection of drug use. Random drug testing requires a specific implementation plan to deter drug use. The rules propose to use a sampling rate of up to 125 percent of employees performing specific sensitive safety and security-related functions. The 125 percent sampling rate is based on the Coast Guard testing program. A 125 percent rate for random testing would have certain advantages. This testing rate has been shown to be a viable deterrent in the Coast Guard program to future drug use and has been proven effective in reducing the present incidence of drug use. The Coast Guard's random testing program of its uniformed personnel resulted in reducing detected drug use by 75 percent in the five years since the program was implemented. This testing rate currently is the best evidence available to the FAA regarding a successful random testing program. The FAA is proposing 125 percent as a potential maximum testing rate. At the same time, the FAA recognizes that the higher the sampling rate, the higher the costs of the program. The FAA invites comments on how low a sampling percentage could be adopted while still maintaining a credible deterrent. In particular, the FAA is interested in information on documented, effective random testing programs and the sampling rates that were used as measured against the incidence of drug use on a year-to-year basis, and information that would provide updated estimates of the relative costs and effectiveness associated with various sampling rates. The FAA also requests commenters to address whether the experience of uniformed personnel in the Coast Guard program is a valid indicator of how sensitive safety and security-related aviation employees would respond to a similar program.

A sampling rate of 125 percent would mean that a population of 10,000 would provide 12,500 annual samples. Similarly, a sampling rate of 12.5 percent would provide 1,250 samples from the same population. Using true random selection, employees selected for each weekly or monthly increment would be returned to the pool of those eligible for testing and would be subject to reselection. The vulnerability for reselection deters drug abuse because an individual selected early in the testing cycle would still be equally subject to testing throughout the remainder of the year and would still risk detection if he or she used drugs after the first test. One feature of this plan is that some employees might not be selected at all during the first year and others could be selected more than once. Another issue in this area is the matter of "randomness" among small or isolated populations. What, for example, is the meaning of a random test to an employee population consisting of only one employee, or a few employees? This problem is particularly acute if the owner or manager of the business is also the sole person, or one of only a few persons, subject to testing. Similarly, although surprise is an essential feature of true random selection, how can this be achieved when the employee is located in a remote location and must be transported some distance to provide a sample? This could result in the loss of the element of surprise in many cases. The FAA seeks comments how to deal with these problems.

4. Employers would be required to obtain urine samples from sensitive safety and security-related employees whose performance contributed to an accident. For the purposes of defining "accident," the FAA proposes to use the definition contained in the regulations of the National Transportation Safety Board (NTSB) (49 CFR 830.2). Should this or any other definition of accident be used instead?

In administering a drug test after an accident, the FAA proposes to authorize employers to test sensitive safety and security-related employees for any Schedule I or Schedule II drug, even though many of these substances would not be tested for in a preemployment, random, or periodic test. This is the same practice as would be followed by the FAA in testing its employees under the proposed Department of Health and Human Services (HHS) guidelines.

It could be both wasteful and intrusive to require testing without some indication that the tested person might have been a cause of the accident. Therefore, it may be desirable to establish a mechanism through which determination would be made about who would be required to undergo a drug test after an accident. Testing after some accidents could be unwarranted, either because the damage is so slight that it is not justified economically, or because the circumstances indicate that human error was not a factor. The FAA invites comment on how the decision would be made. Should the employer decide whether testing is necessary? Should there be a presumption that all employees at the scene should be tested, unless, for example, two company officials concur otherwise? Would these officials have to be supervisors? There may be situations where only one supervisor is available or the only persons at the scene are not supervisors. Should at least one official involved in the decision concerning whom to test be trained in detecting drug use? Are there any practical problems to this approach? What about employees such as mechanics, who may have caused the accident, but who may be far from the scene at the time of the accident? In small companies, what if the deciding officials are involved in the accident? Should the FAA be involved in the decision? Again, how would this be put into practice?

It is important that drug tests be administered as promptly as possible following an accident. The decision whether to test employees should be made quickly so that tests can be administered while evidence of drug use, if any, is still in the employee's system. Should all sensitive safety and security-related employees involved in an accident be tested unless deciding officials determine within a given period of time that certain employees could not have contributed to the accident and can be excluded? Within what period of time would the decision to exclude certain employees be made? The Federal Railroad Administration requires post-accident testing within 4 hours. In their experience, this time constraint is difficult to meet. For employees to be tested, the FAA recognizes that there may be serious logistical problems in administering a drug test as quickly as might be desired. We are therefore proposing that post-accident tests be given as soon as possible and in no event later than 24 hours after an accident. This 24-hour period is intended to be an absolute maximum, and any delay, even within this period, could seriously reduce the value of the test.

5. Testing based on reasonable cause would be based on a reasonable and articulable belief that a sensitive safety and security-related employee is using drugs. Even if no mistakes are made at work, the employee may demonstrate a change in character or behavior that could be symptomatic of drug use. Such changes are normally characterized by mood swings and changes in appearance, attitude, and speech. Because of the subjectivity of the criteria and the possibility of employee harassment, at least two of the employee's supervisory personnel would have to concur in the decision to test an employee based on a reasonable suspicion of drug use. At least one of these supervisors would have to be trained in detecting symptoms of drug use. Are there practical problems to this approach? Should the observers have to be supervisors? There may be situations where only one supervisor is available or the only person in a position to observe an employee is the supervisor? The FAA invites comments on whether there should be exceptions to the two-supervisor rule. If so, what other criteria could be used that would protect a disfavored employee from potential harassment through drug testing? Should there be a limit to the number of times an employee can be subjected to reasonable cause testing in order to prevent unwarranted harrassment? Should there be specified circumstances, such as particular rule violations, under which drug testing would be automatic? If so, what kind of rule violations would suggest a drug problem and should trigger reasonable cause testing? We note in this regard that the Federal Railroad Administration has specified, in its existing drug rule, the types of incidents that could justify requiring an employee to undergo drug testing. Could a similar program work in the aviation industry?

FAA proposes to authorize employers to test sensitive safety and security-related employees for any Schedule I or Schedule II drug when there is reasonable cause to believe a particular drug was used, even though many of the Schedule I and II substances would not be tested for in a preemployment, random, or periodic test. This is the same practice as would be followed by the FAA in testing its employees under the proposed HHS guidelines.

Medical Review Officers

Employers would be required to appoint or designate a Medical Review Officer (MRO). The MRO would perform several functions, including review of the results of the employer's drug testing program; interpretation of each confirmed positive test result; and evaluation of an individual for referral to an EAP rehabilitation program. The FAA also seeks comments on the MRO's appropriate role in determining when an individual might be returned to duty. The proposed rule requires that a MRO be a licensed medical doctor. The MRO could be a currently employed company physician or could be a private physician who performs MRO services for the employer on a contractual basis.

EAP Services

The FAA has determined that properly managed EAP's benefit both management and employees and can be a positive factor in anti-drug programs. The FAA recognizes that individually established EAP's may be beyond the fiscal resources of some employers. However, the employer has a responsibility to employees and the public to provide a drug-free environment to the maximum extent practical. As such, in certain circumstances, employers would provide EAP services or make such services available through one of the following means: Company-operated EAP; contractor or consortium arrangement; or arrangements with local community service organizations for voluntary referrals or employer-directed referrals. Other alternatives to the above must be approved by the FAA and would have to provide an equivalent level of EAP service to employees.

The proposed rule would require that an EAP provide education, training for employees and supervisory personnel, and an opportunity for rehabilitation. An employee must successfully complete a rehabilitation program before being returned to his or her previous duties. The FAA is not proposing to require employers to pay the cost of rehabilitation. At this time, the proposed rule does not impose any limits on the amount of time that an employee may use to complete a rehabilitation program. However, the

FAA recognizes that requiring an employer to hold a position open or adjust operations for an indefinite period, while an employee is enrolled in a rehabilitation, may result in inconvenience and hardship for some employers, especially smaller companies. Therefore, the FAA solicits comments on an equitable and appropriate amount of time for an employee to complete a rehabilitation progam to be specified in the rule, and whether the amount of time should be different for smaller companies. The FAA is particularly interested in time frames that have been shown to be appropriate from other documented rehabilitation programs, taking into account how long it may take for an employee to be admitted to a rehabilitation program. Commenters also should address whether employees involved in EAP programs could be employed in nonsensitive safety and security-related positions during the rehabilitation process. The proposed rule does not require the employer to offer these same opportunities to a repeat offender, to persons not currently employed by the employer who fail a preemployment test, or persons who have been found to use illicit drugs on the job.

The NPRM proposes three different options concerning the circumstances under which employees would be given an opportunity to seek rehabilitation. Under the first option, an employee who comes forward voluntarily or tests positive for drugs for the first time would be eligible for rehabilitation rather than be discharged. Non-employees given a pre-employment drug test need not be given an opportunity for rehabilitation. Once rehabilitated, the employees would be reinstated into his or her prior position. The second option would provide rehabilitation rights to employees who come forward voluntarily or who are identified as drug users during periodic or random tests; but would not require that the same opportunity be afforded to drug users identified in post-accident or reasonable cause tests; those not afforded the right to rehabilitation could be discharged. In the third option, only volunteers could claim rehabilitation rights. Anyone testing positive for drugs (regardless of the circumstances, e.g., random, periodic, post-accident, reasonable cause) could be fired immediately. In all cases, employers would be free to offer more rehabilitation options than the minimum we proposed. Thus, for example, an employer could voluntarily offer two chances at rehabilitation rather than one.

Each of these approaches has its own merits. For example, the broad rehabilitation program anticipated by the first alternative is likely to maximize both the costs and the benefits to society, by ensuring that more drug users will get the help they need. If users are simply fired, they will often lose access to, and perhaps incentive to use rehabilitation services, and they may continue to be drug users. However, it could be argued that employees who are found to be drug users through post-accident or reasonable cause tests are less deserving of an opportunity for rehabilitation, and the second alternative would therefore exclude them. The third alternative is likely to be the lowest in direct costs, because rehabilitation would be required only for employees who seek it voluntarily, but for the same reason, however, this alternative might produce less in societal benefits. Commenters should address whether, and to what extent the third alternative would encourage drug users to identify themselves before they are tested, in contrast to the first and second alternatives, which appear to provide less incentives for drug users to identify themselves before they are discovered through the testing process.

We specifically invite comment on which of these or other alternatives offer the greatest benefits at the lowest cost.

Under any of these options, if the individual was successfully rehabilitated, the program would require that he or she be offered the opportunity to return to his or her former position. The NPRM does not specify who makes the decision concerning whether the individual has been successfully rehabilitated, however. The FAA seeks comments on whether the final rule should so specify.

If the final rule does specify who makes this decision, who should the decision-maker be? Should it be the medical review officer, the head of the EAP, the head of the drug rehabilitation program in which the employee participated, an independent physician, the FAA (e.g., through the office of the Federal Air Surgeon) for certain types of employees, or some combination of these persons? Are there other individuals that should be permitted or required to make the decision?

The FAA also seeks comments on whether the rule should contain standards for making this determination. If so, what should they be? Should the employer, the FAA, or both have a procedure through which the employee can contest a determination that he or she had not been rehabilitated?

Post-rehabilitation Testing

Once an employee has undergone rehabilitation, there may be a need to conduct tests to ensure continued disassociation from drugs. At the time of the adoption of a final rule in this proceeding, we intend to provide procedures for the conduct of such tests. We invite public comment on what the final rule should contain.

For example, should there be a uniform testing period after rehabilitation, or should this be determined on a case-by-case basis? Who should make such a determination: The medical review officer, the EAP counselor, or both together? Should the employee be involved? How could employee involvement be accomplished? If we adopt a uniform post-rehabilitation period, how long should it be? Is six months reasonable? Would longer periods constitute an unacceptable burden on employees and on the employer? Others might argue that a longer follow-up period, such as one year, is called for. Should the length of the follow-up period depend on the kind of drug that was detected? Should it depend on the severity of the individual's drug problem, as indicated by the kind of treatment that was found to be necessary? For example, should someone undergoing inpatient rehabilitation be subject to post-rehabilitation testing for a longer time than someone who needs only abatement counseling?

During the post-rehabilitation period, should we prescribe the minimum and/or maximum number of tests to be administered? We would want to ensure that any necessary tests would be given frequently enough to ensure that the employee is free of drugs. At the same time, however, we do not want drug testing to become an instrument of harassment of the employee or an undue burden on the employer. Here again is the issue of whether the number of tests given should vary with the kind of drug used and the severity of the employee's problem.

One alternative, on which we also invite comments, is a specified post-rehabilitation testing period that would apply only if the employee, the EAP counselor, and perhaps the employer failed to agree on an individualized program. Such a fall-back system could provide, for example, for up to four additional tests over the 12 months following rehabilitation.

Temporary Employees

Although the rehabilitation of drug users is a cornerstone of this program,

we believe that there may be some employees in the industry whose normal period of employment is too short to make it practical to require rehabilitation and reemployment. For example, even if a short-term hire seeks rehabilitation, the end of the scheduled employment term might come before the completion of a rehabilitation program. Therefore, we are considering not requiring employers to offer an opportunity for rehabilitation to temporary employees who are hired for a period of less than 90 days. That is, if such employees are found to be drug users, it would be permissible to dismiss these persons immediately.

However, we recognize that some employees hired on a "temporary" basis are actually regularly reemployed. Some of these employees are recurring seasonal hires, others are continually reemployed at the end of each specified term. These persons are regular members of the industry, and thus, should not be excluded from the opportunity for rehabilitation and reemployment. Under the proposal, an employee would not be considered temporary for the purposes of rehabilitation, if he of she is eligible for reemployment by the same employer within 90 days following the end of the employment term. We specifically request comments on (1) the merits of excluding temporary employees from the opportunity for rehabilitation, and (2) the definition of temporary employees. Commenters also should address how the rules should be applied to striking employees or employees scheduled for layoffs. Definitions of these terms also should be addressed.

Implementation

The FAA must exercise oversight over the establishment of individual programs to ensure their effectiveness. This oversight can best be implemented by requiring each employer to submit a plan acceptable to the Administrator that would set forth the specific details of an anti-drug program. The employer's proposed anti-drug plan would have to be submitted to the FAA within 120 days after the effective date of the final rule. The FAA would respond only if a plan was considered inadequate. The FAA would complete its review within 60 days after submission of an employer's program and would notify those employers with inadequate plans within that 60-day period. The anti-drug program would be required to be implemented 180 days after the deadline for submitting the program.

Reporting Requirements

Semiannual and annual reports of the results under each program would be required under the proposed rule. The report would contain demographic data of drug abuse by occupational category, drugs detected, and geographic locations.

Those semi-annual and annual progress reports would be sent to FAA. The FAA is proposing that the reports should provide the following summary information for each type of testing performed: Occupational group of tested employees' the specific drugs detected and the disposition of employees (e.g., termination, rehabilitation, resignation, and other categories as applicable, such as leave without pay). Confidentiality must be afforded to all information regarding drug abuse by employees. This data would be used by the FAA only to summarize trends and determine if additional actions or changes may be required to combat drug use and abuse in aviation. We invite comments on the frequency and content of reports to be filed.

Employer Flexibility

The FAA recognizes that drug use is a complex problem that requires dynamic, responsive solutions. The FAA believes that its proposed program meets the agency's statutory mandate to promote the safety of civil aircraft flying in air commerce and that it responds to the public's need for a safe and drug-free aviation environment. The FAA is also interested in comments on whether there are ways to increase flexibility in the program or reduce costs without decreasing safety. For example, should the FAA allow covered employers the option of submitting to the Administrator for approval a company-specific anti-drug program in lieu of complying with the FAA proposed rule?

Would allowing for company-specific anti-drug programs be consistent with the FAA's mandate for ensuring a safe and drug-free aviation environment? In other areas, such as those dealing with aircraft maintenance, flight operations, airport security, and carry-on baggage, the FAA has permitted airlines and other aviation companies to develop and implement safety programs tailored to meet requirements particular to that company. The FAA reviews such programs for their consistency with FAA safety goals. These programs have made it possible to give increased flexibility to companies while continuing to ensure that the programs are carried out in a manner that ensures safety for the travelling public. Is there any way in which the FAA may best afford employers subject to the proposed drug abatement rule similar flexibility? What would be the likely cost savings, if any, associated with a flexible approach?

The FAA recognizes the costs and burdens associated with drug abatement in general, and wants to ensure that aviation anti-drug programs are as cost-effective as practicable. Would providing for company-specific programs encourage the development of innovative solutions that may be less costly and more effective? How? Could similar innovations be developed under the proposal set forth in this notice? How can the FAA ensure that its final rule will promote the development of efficient and more effective solutions?

The proposed FAA program includes a required random sampling rate that could range as high as 125 percent of the tested population. This level has proven to be effective in reducing drug use among Coast Guard personnel, but we have asked for comments on how low a testing percentage could be adopted without undermining the deterrent effect of the testing program. Whatever sampling rate is chosen as the industry-wide norm, would it be possible for a company-specific program to be designed in a way that would allow employers who can justify a need to test at a lower or higher sampling rate to test at that rate. How could this be accomplished?

The FAA also requests comments on whether employers could also limit the size of the population subject to a full range of testing strategies to those sub-groups of employees where an initial round of testing has revealed a more serious drug-use program. In such a case, the employers may be able to rely on a less costly set of requirements to ensure that employees in sub-groups with less serious or more easily determined problems, remain risk-free. In addition, are there ways employers may avail themselves of less costly and less intrusive technologies as such advances are made while ensuring an appropriate-level of safety. Are there other types of flexibility that the FAA should consider? Commenters are requested to submit any empirical data that support their views.

Could the current proposal provide similar flexibility by simply providing a waiver for companies that, for example, ask to use a test they establish achieves an equivalent level of safety? What, if any, fundamental requirements should be present in an acceptable company-specific drug abatement program, and what guidelines would the FAA use in reviewing requests for waivers or amendments if such modifications are

allowed? Should, for example, the FAA be required to approve any modifications that are designed to achieve a safe and drug-free aviation environment? Should these requirements or review guidelines be different from modifications submitted by small companies? Should the FAA be required to act on an application for approval of a company-specific program, an amendment, or a waiver request, within a set time period? What form should the application take? What impact would allowing these alternatives for increasing flexibility have on the FAA?

Access to Employee Drug Use Information

The proposed rule would regulate access to information about an employee's drug testing history under the anti-drug program by subsequent employers or employers in other transportation modes. The FAA specifically requests public comment on what procedures, if any, should be included in the rules to safeguard the privacy of persons tested under the anti-drug program. As noted above, we are considering a variety of options with respect to preemployment drug tests, including mandatory destruction of the documents for employees not hired. The results of drug tests performed for other reasons, however, also raise important privacy questions. Therefore, we specifically invite comments about whether there are circumstances under which we should permit the disclosure of drug test data to persons other than the employer and the employee (such as future employers). If, in the final rule, we were to allow such disclosure, there would appear to be a number of options. First, the data could be released only at the specific requests of the future employer, at either the discretion of the employer conducting the test, or only at the request of the employee. Under another option, a subsequent employer could require that an applicant either disclose prior drug test results or give the employer permission to obtain prior drug test results as a condition of employment. A final option under consideration by the FAA is authorizing the release of test results to future employers only in specified circumstances. For example, confirmed positive test results would be released to subsequent employers where an employee had been discharged for a refusal to participate in a rehabilitation program or an employee had failed a drug test after completing rehabilitation. Interested persons also should comment on whether the proposed rules should treat the privacy issues related to preemployment tests differently from random, reasonable cause, and periodic tests.

The potential release of data highlights the importance of an employee's right to contest the test results. A urine sample that had been subject to tampering could unjustly end an employee's career. An employee should have an opportunity to challenge the integrity of the testing process, for example, by contesting whether the positive test result arose from a tampering incident or other error in the testing process. The FAA, therefore, requests comments on what procedures should be adopted. Commenters also should address whether the types of procedures afforded an employee should vary depending upon the consequences of a positive test and whether the burden or proof on the validity of test results should be borne by the employee or the employer.

In addition to future employers, other individuals may want access to the results of drug tests conducted under the proposed rules. The FAA could prohibit access to test results by the general public, including the news media. Moreover, other government agencies may want the data for statistical, regulatory, or law enforcement purposes. The FAA requests comments on whether the rule can and should prohibit access to the results of the anti-drug program to individuals other than the employer and the employee.

A related issue involves whether the FAA should distinguish between general statistical data (the total number of positive tests at a company in a month or a year) and particularized data (name-specific data). Small operators who employ few individuals will have difficulty concealing the identity of individuals tested under the proposed anti-drug program. Since small operators will have few individuals to test in any given time period, even seemingly neutral statistical data would result in identification of an individual employee who was dismissed as a result of a confirmed positive test result. This potential may be exacerbated if the FAA requires that only a small percentage of employees be tested each year.

HHS Guidelines

On August 14, 1987, the Department of Health and Human Services (HHS) published proposed guidelines for drug testing procedures and standards for certifying drug testing laboratories (52 FR 30638; a final version of the guidelines is expected to be published before the final rule based on this NPRM). As drafted, the guidelines apply to drug testing programs conducted by Federal agencies themselves. This NPRM would direct regulated parties to conduct their drug-testing programs according to these guidelines as well.

The HHS guidelines include proposed solutions to concerns such as the integrity of the sample collection process, maintaining a proper chain of custody, and ensuring that laboratories that do drug testing are qualified to do so.

The HHS guidelines would establish what illegal drugs are to be tested for (e.g., marijuana, cocaine, amphetamines, PCP, and opiates) and the levels of drug metabolites in a sample that would result in a positive test being reported. The guidelines specify the types of tests that would be required for initial screening tests (an immunoassay test) and confirmatory tests (a gas chromatography/mass spectrometry test).

The guidelines also specify collection procedures. These include the use of toilet bluing agents, temperature monitoring, and other steps to ensure the integrity of the sample without requiring observation of the individual while he or she is providing the sample. The sample collection procedures also include filling out a chain-of-custody form to accompany the sample as it goes to the laboratory.

The guidelines for laboratory processing of samples cover both technical and procedural steps designed to ensure that a proper chain of custody is maintained and that the test is conducted accurately. Intralaboratory chain-of-custody forms would be used; only authorized personnel would have access to the sample. Records concerning the calibration of testing instruments would be maintained. Laboratories would report test results to the employer in a timely manner, and statistics on the tests would be retained by the laboratory for 2 years.

In addition to setting forth qualifications for key laboratory personnel and quality control procedures for the laboratories, the guidelines include standards and procedures through which HHS certifies laboratories. Regulated parties would be required to use only those laboratories which HHS has certified pursuant to these standards.

There are a few particulars in which the proposed rule differs from the proposed HHS guidelines. For example, medical review officers (MROs) are assigned duties in Appendix I in addition to those in the guidelines. There are also additional requirements concerning inspections of laboratories by both the employer and the FAA and

concerning employee requests for retesting.

Discussion of Proposed Rules

Performance of Duties by Persons Using Certain Drugs

Proposed §§ 121.455(b) and 135.249(b) would prohibit Part 121 and 135 certificate holders and "operators" as defined in this notice from knowingly using any person to perform, and prohibit any person from performing, a function listed in proposed new Appendix I to Part 121 while that person has a prohibited drug, as defined in Schedules I and II of the Controlled Substances Act, in his or her system. This requirement also would apply to persons performing these functions under contract for the certificate holder or operator. This requirement would not apply if the individual was lawfully using a drug according to a medical prescription unless such use would affect the employee's faculties in any way contrary to safety.

A similar requirement would be added as new § 65.46(c) to apply to an air traffic control facility not operated by, or under contract with, the FAA or the U.S. military.

Use of Persons Failing a Test for Prohibited Drugs

Proposed §§ 121.445(c) and 135.249(c) would prohibit Part 121 and 135 certificate holders and "operators" as defined in this notice from knowingly using any person to perform, and prohibit any person from performing, a function listed in proposed new Appendix I to Part 121, if that person has failed a required drug test specified in that appendix. This rule would also apply to contractors. An Employee who is required to hold a medical certificate issued under Part 67 of this chapter and who fails a drug test under an FAA approved drug program is subject to suspension or revocation of that certificate if the results of the drug test indicate drug use and the tested employee is found to be drug dependent.

The requirement would not apply to persons who have successfully completed an approved rehabilitation program after notification of failing a drug test, who have received a recommendation for return to duty as a result of that rehabilitation program, and who have not subsequently failed another drug test. Similar provisions for air traffic control tower operators would appear in proposed § 65.46.

Drug Testing Program

A new Appendix I would be added to Part 121. It would contain the requirements with respect to who must be tested and what tests must be conducted. It would provide for testing pursuant to the procedures and requirements set out in the proposed HHS guidelines. The proposed appendix would set out the required content of EAP's, including specifying which employees would be given an opportunity for rehabilitation. It would require an education program and a training program, and state what must be included in each.

Required Testing

Proposed §§ 121.457, 135.251, and 65.46 would require Part 121 and Part 135 certificate holders, "operators" as defined in this notice, and air traffic control facilities not operated by, or under contract with, the FAA or the U.S. military to test each of its employees who perform a function specified in proposed Appendix I in accordance with that appendix. None of these employers would be allowed to use any contractor to perform a function specified in the proposed appendix unless that contractor tests each employee performing such a function in accordance with that appendix.

Required Training

Part 121 and Part 135 certificate holders, "operators" as defined in this notice, and air traffic control facilities not operated by, or under contract with, the FAA or the U.S. military would be required to provide specified training to each employee performing a function listed in proposed Appendix I, and his or her supervisor, with the training specified in the appendix. This training would include instructions on the effects and consequences of drug use on personal health, safety, and work environment, as well as the manifestations and behavioral clues that may indicate drug use. None of these employers would be allowed to use any contractor to perform a function specified in that appendix unless that contractor provides the same training to its employees who perform those functions.

Refusal to Submit to a Test

New Provisions would be added to Parts 61, 63, and 65 to provide that refusal to take a required drug test by a person who performs a function listed in Appendix I when requested to do so by his or her employer under that appendix would be grounds for denial of an application for a certificate. Such a refusal would also be grounds for suspension or revocation of a certificate.

Implementation

Appendix I would require the employer to submit a drug testing plan to the FAA for review within 120 days after the effective date of the final rule, or 120 days after issuance of a certificate under Part 121 or Part 135 to the employer, whichever is later. Operators would be required to submit a drug-testing plan to the FAA for review within 120 days after the effective date of the final rule, or 120 days after beginning covered operations listed in § 135.1(b), whichever is later. Each contractor who provides employees who perform a function listed in that appendix would have to submit a drug testing plan within 120 days after the effective date of the final rule or within 120 days after award of a contract, whichever is later. The plan would have to specify, among other things, the methods by which the employer will comply with the FAA rule. It would also have to specify the procedures and personnel the employer will use to ensure that a determination is made as to the veracity of test results and any possible legitimate explanation for an employee failing a test.

The employer would be allowed to consider its drug testing plan to be acceptable to the Administrator unless notified to the contrary by the FAA within 60 days of the implementation date.

Implementation Date

It is proposed to require that an employer's anti-drug program be implemented 180 days after the deadline for submitting the program to the FAA.

Economic Summary

The following is a summary of the preliminary industry cost impact and benefit evaluation for the regulatory changes proposed in this notice to require domestic and supplemental air carriers, commercial operators of large aircraft, air taxi operators, commercial operators, certain contractors to these operators, air traffic control facilities not operated by, or under contract with, the FAA or by the U.S. military, and certain organizations and individuals operating aircraft for compensation or hire under specified categories listed in § 135.1(b) to have an anti-drug program for employees who perform specific sensitive safety and security-related functions. The proposed rules are needed to prohibit, absolutely, the presence of a prohibited drug in an employee's system at any time. The proposed rules are intended to foster a drug-free aviation environment and to

eliminate drug abuse in commercial aviation.

Under these proposed rules, testing would be conducted prior to employment, periodically, randomly, after an accident, and based on reasonable cause. In addition, these proposed rules would require that an employer provide an Employee Assistance Program (EAP) for its employees. The FAA has determined that the proposed rulemaking is a major rule under Executive Order 12291 because the proposed requirements are likely to result in an annual effect on the economy of over $100 million.

In developing its program, the FAA is considering three alternatives concerning requirements for rehabilitation. All three have been analyzed for costs and benefits using 125 percent and 12.5 percent annual sampling rates for random testing. Under the first option, an employee who comes forward voluntarily or tests positive for illicit drug use for the first time would be eligible for rehabilitation. Once rehabilitated, the employee be reinstated into his or her prior position. The second option would afford rehabilitation rights to employees identified as illicit drug users during periodic or random tests, but would not require employers to afford the same opportunity to drug users identified in post-accident or reasonable cause tests. Under the third option, only volunteers who self identify or are referred by a co-worker would be afforded rehabilitation rights. The employer would have the right to dismiss anyone testing positive for drugs (i.e., periodically, randomly, after an accident, and based on reasonable cause).

One basic assumption the FAA used in developing Option 3 is that there would be a greater number of individuals volunteering for rehabilitation at a higher sampling rate than at lower ones based on fear of detection. Of course, employers would be free to offer more rehabilitation options than the minimums required by this notice. A detailed analysis of these options is presented in the Regulatory Impact Analysis and is contained in the docket. Also, the total cost of compliance with the three different rehabilitation options at different sampling rates are shown in Exhibit A of this summary. The assumptions used in preparing the economic impact estimates of the proposed changes have been developed by the FAA. Cost factors were obtained from information received in response to an earlier Advance Notice of Proposed Rulemaking, and additional data furnished by air carrier industry trade associations, public institutions, and major chemical laboratories. These estimates of cost impact may be revised before the final Regulatory Impact Analysis is issued based on public comment and other information that becomes available.

The proposals to amend Part 121 would affect the 146 currently active scheduled and nonscheduled Part 121 certificate holders and certain entities who provide contractual services to them. The notice also affects the 3,614 scheduled-service and on-demand Part 135 operators and certain entities who provide contractual services to them. In addition, these proposals would also affect an undetermined number of organizations engaging in the types of operations listed under § 135.1(b). Because of the highly diversified and multipurpose nature of operations listed in § 135.1(b), it has not been possible to determine the exact number of organizations that engage in these types of operations. Nevertheless, the FAA has used the 850 currently active pilot schools as the basis for estimating the impact of these proposals on those entities listed under § 135.1(b). While the actual number of these organizations may be higher, the FAA believes that the 850 pilot schools selected represent the majority of organizations conducting operations listed in § 135.1(b). Comments are requested on these estimates.

EXHIBIT A.—AGGREGATE COMPLIANCE COSTS, 1989–97

Option 1

	125% sampling rate		12.5% sampling rate
Employee rehabilitation cost	$600,979,772		$75,130,727
Drug testing program cost	245,885,672		64,700,785
Aggregate compliance cost (10 years—1987 dollars)	846,865,444		139,831,512
(10 years 10% present worth)	597,356,865		98,633,513

Option 2

	125% sampling rate		12.5% sampling rate
Employee rehabilitation cost	599,822,204		74,986,015
Drug testing program cost	245,885,672		64,700,785
Aggregate compliance cost (10 years—1987 dollars)	845,707,876		139,686,800
(10 years 10% present worth)	596,304,520		98,497,933

Option 3

	125% sampling rate		
	10% voluntary	20% voluntary	30% voluntary
Employee rehabilitation cost	79,264,722	158,529,444	237,794,166

EXHIBIT A.—AGGREGATE COMPLIANCE COSTS, 1989-97—Continued

Drug testing program cost	245,885,672	245,885,672	245,885,672
Aggregate compliance cost (10 years—1987 dollars)	325,150,394	404,415,116	483,679,838
(10 years 10% present worth)	203,824,979	258,718,344	313,611,710
	12.5% sampling rate		
	1% voluntary	2% voluntary	3% voluntary
Employee rehabilitation cost	980,894	1,961,788	2,942,674
Drug testing program cost	64,700,785	64,700,785	64,700,785
Aggregate compliance cost (10 years—1987 dollars)	65,681,679	66,662,573	67,643,459
(10 years 10% present worth)	44,353,326	45,033,344	45,713,357

These entities will incur additional costs because they will be required to comply with the proposed anti-drug programs specified in proposed Appendix I to Part 121. The FAA believes that three major benefits would accrue from these proposals. First, the proposal could help to prevent potential fatalities and property loss resulting from an accident attributed to neglect or error on the part of an individual whose judgment or motor skills may be impaired by the presence of illicit substances in his or her system. Second, benefits would accrue to affected employers from the potential reduction in absenteeism, lost worker productivity, medical and insurance costs, and improved general safety in the work place. Lastly, the reduction of drug abuse in a vital and socially important industry such a commercial aviation would represent a broad benefit to air commerce. The FAA has been unable to estimate quantitatively the extent to which the proposed rule would reduce drug use in the commercial aviation industry, and thus would enhance aviation safety or directly promote the commercial aviation industry and air commerce. A review of the safety record indicates that there have not been any fatal accidents involving passenger carrying commercial airline pilots where drugs or alcohol were shown to be factors. In the absense of statistical data depicting the extent of drug abuse in commercial aviation, and in light of the potential risks associated with drug use, however, the FAA does not consider this safety record to be the only indicator of the potential threat posed to aviation safety by drug use. The FAA believes that drug use, unless stemmed, could be a major threat to aviation safety in the future. The FAA invites commenters to identify other indicators of the risks associated with the drug use by sensitive safety and security-related aviation employees.

As shown in a June 1984 U.S. Department of Health and Human Services report entitled "Economic Costs to Society of Alcohol and Drug Abuse and Mental Illness: 1980", the economic cost to society at large from drug abuse is estimated to be $66 billion annually. Using this annual figure, the total cost to society from drug abuse over the 10-year period following 1988 would be $405.5 billion (discounted) more if corrective measures are not taken. The 1988 GAO Report cited a Research Triangle Institute study, "Economic Costs to Society of Alcohol and Drug Abuse and Mental Illness", which estimated that the economic cost of drug abuse to the United States during 1983 was $59.7 billion. This study, prepared for the Alcohol, Drug Abuse and Mental Health Administration (ADAMHA), estimated "the costs of drug abuse to society for crime * * *, reduced productivity, treatment, and other items. The estimate did not include items such as social costs (e.g., family conflict, suicide) and the value of the illicit drugs consumed." A copy of the GAO report has been placed in the docket. As the FAA obtains other data on drug use, it will place that data in the docket.

The estimated 511,628 employees in the commercial aviation industry covered by these proposals represent approximately two-tenths of one percent of the United States population of 236,000,000. Thus, if these proposals induce current drug users in the commercial aviation industry to abandon drug use over the 10-year period following enactment of the proposed rules, and if drug use is as prevalent in the aviation industry as society at large, the FAA estimates that there be a discounted savings to society of $879.0 million. Of course, if drug use is not as prevalent among covered aviation employees as it is in society at large, the benefits would be correspondingly smaller. The opposite would be true if drug use is more prevalent. The FAA does not have enough information on which to base an estimate of the incidence of drug use among aviation employees. Absent more accurate data, the FAA assumes, for the purpose of this proposal, that the aviation drug problem is similar to that found among the general population. Should more accurate data become available to the docket, the FAA may revise this analysis as warranted. Commenters are specifically invited to submit data on the incidence of drug use among sensitive safety and security-related aviation employees.

Information available on sampling rates to the FAA indicates that random testing conducted in a work-related environment at a sampling rate of 125 percent of the affected population has been an effective deterrent to drug abuse. Accordingly, the FAA is assuming for the purposes of this analysis that maximum potential benefit to be realized from implementation of any of the proposed options at a rate of 125 percent is $879.0 million. The FAA, however, does not have information on which to base an estimate of the deterrence of a lower sampling rate. However, for purposes of this analysis, the FAA assumed that the potential benefit of testing at 12.5 percent is estimated to be $87.9 million; this is based on the assumption that there would be a tenfold reduction of the overall discounted savings. However, FAA recognizes that lower sampling rates may produce higher or lower benefits. Therefore, the FAA specifically requests comments on this assumption and any relevant data on the

effectiveness of a lower sampling rate. Exhibit B, below, shows a comparison of the benefit to cost relationship of these options and using the assumptions outlined above the rate that each would need to be effective in deterring drug abuse for benefits to equal costs.

EXHIBIT B.—SUMMARY OF BENEFITS AND COSTS

[In millions of dollars]

Option 1

	125% random sampling		12.5% random Sampling
Present value:			
Costs	$597.3		$98.6
Benefits	$879.0		$87.9
Benefit/cost ratio	$1.5		$.89
Effectiveness rate (percent)	68		112

Option 2

	125% random sampling		12.5% random Sampling
Costs	$596.3		$98.4
Benefits	$879.0		$87.9
Benefit/cost ratio	$1.4		$.89
Effectiveness rate (percent)	68		112

Option 3

125% random sampling

	10% voluntary	20% voluntary	30% voluntary
Costs	$203.1	$258.7	$313.6
Benefits	$879.0	$879.0	$879.0
Benefit/cost ratio	$4.3	$3.4	$2.8
Effectiveness rate (percent)	23	29	36

12.5% random sampling

	1% voluntary	2% voluntary	3% voluntary
Costs	$44.3	$45.0	$45.7
Benefits	$87.9	$87.9	$87.9
Benefit/cost ratio	$2.0	$2.0	$1.9
Effectiveness rate (percent)	50	51	52

As shown in Exhibit B, the $597.0 million estimated discounted cost on implementing rehabilitation at a random testing sampling rate of 125 percent would be recovered if this alternative were 68 percent effective in eliminating drug use in the commercial aviation industry over the ensuing ten-year period following enactment of the proposed rule. Conversely, the $44.7 million estimated discounted cost of adopting the least costly rehabilitation option at a 12.5 percent random sampling rate, and a 3 percent voluntary EAP enrollment, would be recovered if this option were 52 percent effective in deterring drug abuse. Depending on the effectiveness of a lower testing rate on reducing drug use, the first option may provide more benefits to society by ensuring that more drug users will obtain needed help. These benefits would be provided, however at a much greater cost. If users are simply fired, they may lose access to rehabilitation services and may be more likely to continue to be drug users. On the other hand, a lower sampling rate of 12.5 percent and voluntary EAP enrollment may see fewer individuals motivate (through fear of detection by random testing) to volunteer for rehabilitation. For this reason, adoption of this option may be less costly but could produce lower societal benefits.

Finally, option 3 will probably induce more drug users to self-identify than do options 1 and 2. To the extent that this happens, would the rule achieve a given level of drug abatement, and therefore provide more benefits at a lower sampling rate than would be required under either option 1 or 2?

The FAA lacks information on which to base an assessment of the deterrent effect of the proposed rehabilitation options presented in the proposed program. The FAA, therefore, specifically seeks comments on the effect on the cost and benefits of the proposed program examined in the regulatory evaluation as follows:

(1) What is the deterrent effect of sampling rates of 125 percent versus 12.5 percent? How would different sampling rates affect the numbers of drug users who volunteer for rehabilitation under each of the rehabilitation options? Is there any evidence to support alternative assumptions regarding the rates at which drug users would volunteer for rehabilitation?

(2) What is the lowest sampling rate for random testing that would be effective in deterring drug use?

(3) Would higher sampling rates in sufficiently higher benefits justify the costs?

(4) Do lower sampling rates necessarily result in lower benefits? Is it reasonable to assume that benefits are directly proportional to the sampling rate?

(5) Would higher sampling rates add sufficient deterrence to reduce the costs of and need for rehabilitation?

(6) Who should be afforded EAP services and under what circumstances?

(7) What is the estimated level of voluntary enrollment in EAP rehabilitation services under each rehabilitation option?

(8) What are the estimated costs of individual EAP services at sampling rates of 125 percent and at 12.5 percent under each rehabilitation option?

(9) To what extent would each of the three alternatives raise or lower costs and benefits? Is it reasonable to assume that more drug users would self-identify under option 3 than under either of the other two options?

(10) Are the costs of required rehabilitation programs warranted by the reduction in societal costs resulting from drug abuse?

(11) Over 50 percent of the $66 billion estimate of the cost of drug abuse in society at large is in the form of reduced income of drug users compared with those who do not use drugs. Is it reasonable to assume that a corresponding percentage of benefits would result from increased productivity of the covered aviation employees? Are there more accurate estimates and estimating methodologies that should be used in estimating the potential benefits associated with this proposal?

The FAA has no statistical data on which to base an assessment on how many individuals will be referred for testing due to reasonable cause. Therefore, the FAA solicits data, views, etc., concerning industry training programs to be provided to supervisors and managers on how to detect drug abuse. Specific comments are requested as follows:

(1) Name and source of training program? Costs of programs?

(2) Identity of methods employed to detect drug abuse?

(3) What is the success rate of these programs? Are success rates different for different classes of illicit drugs? Different types of employees?

(4) Did the number of referrals for testing based on reasonable cause increase after supervisors and employees were trained on how to detect signs of illicit drug abuse, and, what were the referral rates prior to training, and following training?

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 requires a review of proposed rules to assess their impact on small entities. In consideration of the cost information discussion under the Regulatory Impact Analysis, the FAA concludes that these proposed rules could have a significant economic impact on a substantial

number of small entities. However, the FAA knows of no practicable alternatives for small employers to adopt that would reduce the cost of compliance yet achieve the levels of protection sought by these proposals. A regulatory flexibility analysis discussing this issue in more detail has been placed in the docket.

International Trade Impact Statement

While these proposals would only affect domestic operators, the costs imposed by these proposals may impact on trade opportunities for U.S. firms doing business overseas on foreign firms doing business in the United States insofar as those firms have employees who work both in foreign and domestic markets and administrative programs that bridge domestic and foreign markets. An assessment of those impacts will be placed in the docket.

Paperwork Reduction Act Approval

Proposed Appendix I Part 121 would require the employer to maintain testing records on each employee and to provide the FAA with periodic written reports summarizing test results. In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96–511), the record keeping and reporting provisions contained in this notice will be submitted for approval to the Office of Management and Budget (OMB). Comments on these requirements should be submitted to the Office of Information and Regulatory Affairs (OMB), New Executive Office Building, Room 3001, Washington, DC 20503; Attention: FAA Desk Officer (Telephone 202–395–7340). A copy should be submitted to the FAA Docket. Commenters should especially provide their views on the accuracy of FAA's estimates of the burdens associated with these requirements, the practical utility of the information obtained, and less burdensome reporting alternatives to those proposed in this notice.

Federalism Implications

The regulations proposed herein would not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Thus, in accordance with Executive Order 12612, preparation of a Federalism Assessment is not warranted.

Significance

These proposals, if adopted, are likely to result in an annual effect on the economy of $100 million or more and a major increase in costs for consumers, industry, or Federal, State, or local Government agencies. Accordingly, the FAA has determined that this proposal involves proposed regulations that may be major regulations under Executive Order 12291. Since the proposals concern an issue on which there is substantial public interest, the FAA has also determined that this action is significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 2, 1979).

A draft Regulatory Impact Analysis of the proposals has been placed in the regulatory docket. A copy may be obtained by contacting the person identified under **"FOR FURTHER INFORMATION CONTACT."**

List of Subjects

14 CFR Part 61

Air safety, Air transportation, Aviation safety, Drug abuse, Narcotics, Safety.

14 CFR Part 63

Air safety, Air transportation, Airmen, Aviation safety, Drug abuse, Narcotics, Safety, Transportation.

14 CFR Part 65

Air safety, Air transportation, Airmen, Aviation safety, Drug abuse, Narcotics, Safety.

14 CFR Part 121

Aircraft pilots, Airmen, Aviation safety, Drugs, Narcotics, Pilots, Safety.

14 CFR Part 135

Air carriers, Air transportation, Airmen, Aviation safety, Safety, Drugs, Narcotics, Pilots.

Proposed Amendment

Accordingly, the FAA proposes to amend Parts 61, 63, 65, 121, and 135 of the Federal Aviation Regulations (14 CFR Parts 61, 63, 65, 121, and 135) as follows:

PART 61—CERTIFICATION: PILOTS AND FLIGHT INSTRUCTORS

1. The authority citation for Part 61 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1421, 1422, and 1427; 49 U.S.C. 106(g) (Revised, Pub. L. 97–449, January 12, 1983).

2. By adding a new § 61.14 to read as follows:

§ 61.14 Refusal to submit to a drug test.

(a) This section applies to—

(1) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a Part 121 or 135 certificate holder; and

(2) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a person conducting an operation listed in § 135.1(b) of this part for compensation or hire. An employee of a person conducting operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958 is excluded from the requirements of this section.

(b) Refusal to take a test for a drug specified in Appendix I to Part 121 of this chapter when requested by the employer, by a local law enforcemet officer under his or her own authority, or by an FAA inspector, under the circumstances specified in that appendix, is grounds for—

(1) Denial of an application for any certificate or rating issued under this part for a period of up to 1 year after the date of that refusal; and

(2) Suspension or revocation of any certificate or rating issued under this part.

PART 63—CERTIFICATION: FLIGHT CREWMEMBERS OTHER THAN PILOTS

3. The authority citation for Part 63, Subpart A, is revised to read as follows:

Authority: 49 U.S.C. 1354, 1355, 1421, 1422, and 1427; 49 U.S.C. 106(g) (Revised, Pub. L. 97–449, January 12, 1983).

4. By adding a new § 63.12b to read as follows:

§ 63.12b Refusal to submit to a drug test.

(a) This section applies to—

(1) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a Part 121 or 135 certificate holder; and

(2) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a person conducting an operation listed in § 135.1(b) of this part for compensation or hire. An employee of a person conducting operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958 is excluded from the requirements of this section.

(b) Refusal to take a test for a drug specified in Appendix I to Part 121 of this chapter when requested by the employer, by a local law enforcement officer under his or her own authority, or by an FAA inspector, under the circumstances specified in the appendix, is grounds for—

(1) Denial of an application for any certificate or rating issued under this part for a period of up to 1 year after the date of that refusal; and

(2) Suspension or revocation of any certificate or rating issued under this part.

PART 65—CERTIFICATION: AIRMEN OTHER THAN FLIGHT CREWMEMBERS

5. The authority citation for Part 65 continues to read as follows:

Authority: 49 U.S.C. 1354, 1355, 1421, 1422, and 1427; 49 U.S.C. 106(g) (Revised, Pub. L. 97–449, January 12, 1983).

6. By adding a new § 65.23 to read as follows:

§ 65.23 Refusal to submit to a drug test.

(a) This section applies to—

(1) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a Part 121 or 135 certificate holder; and

(2) An employee who performs a function listed in Appendix I to Part 121 of this chapter for a person conducting an operation listed in § 135.1(b) of this part for compensation or hire. An employee of a person conducting operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958 is excluded from the requirements of this section.

(3) An employee of an air traffic control facility not operated by, or under contract with, the FAA or the U.S. military.

(b) Refusal by the holder of a certificate issued under this part to take a test for a drug specified in Appendix I to Part 121 of this chapter when requested by a Part 121 or 135 certificate holder, an operator as defined in § 135.1(c) of this chapter, an employer as defined in § 65.46 of this part, a local law enforcement officer under his or her own authority, or an FAA inspector, under the circumstances specified in that appendix, is grounds for—

(1) Denial of an application for any certificate or rating issued under this part for a period of up to 1 year after the date of that refusal; and

(2) Suspension or revocation of any certificate or rating issued under this part.

7. By adding a new § 65.46 to read as follows:

§ 65.46 Use of prohibited drugs.

(a) For the purpose of this section:

An "employee" is a person who performs an air traffic control function for an employer.

An "employer" means an air traffic control facility not operated by, or under contract with, the FAA or the U.S. military that employs a person to perform an air traffic control function.

(b) Each employer shall provide each employee and his or her supervisor with the training specified in Appendix I to Part 121 of this chapter. No employer may use any contractor to perform an air traffic control function unless that contractor provides each of its employees performing that function for the employer and his or her supervisor with the training specified in that appendix.

(c) No employer may knowingly use, either directly or by contract, any person to perform, nor may any person perform for an employer, any air traffic control function while that person has a prohibited drug, as defined in Appendix I to Part 121 of this chapter, in his or her system.

(d) Except as provided in paragraph (e) of this section, no employer may knowingly use any person to perform, nor may any person perform for an employer, any air traffic control function, either directly or by contract, if that person failed a test required by Appendix I to Part 121 of this chapter given by an employer or a Part 121 or 135 certificate holder.

(e) Paragraph (d) of this section does not apply to a person listed in section VIII.A.1. of Appendix I to Part 121 of this chapter who has successfully completed a rehabilitation program under that Appendix and has received a recommendation for return to duty as a result of that rehabilitation program, and who has not failed a test required by that appendix for any employer or Part 121 or 135 certificate holder after the first time he or she completed such a program.

(f) Each employer shall test each of its employees in accordance with Appendix I to Part 121 of this chapter. No employer may use any contractor to perform any air traffic control function unless that contractor tests each employee performing such a function for the employer in accordance with that appendix.

PART 121—CERTIFICATION AND OPERATIONS: DOMESTIC, FLAG, AND SUPPLEMENTAL AIR CARRIERS AND COMMERCIAL OPERATORS OF LARGE AIRCRAFT

8. The authority citation for Part 121 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1356, 1357, 1401, 1421–1430, 1472, 1485, and 1502; 49 U.S.C. 106(g) (Revised, Pub. L. 97–449, January 12, 1983).

9. By adding a new § 121.429 to read as follows:

§ 121.429 Prohibited drugs.

(a) Each certificate holder shall provide each employee performing a function listed in Appendix I to this part and his or her supervisor with the training specified in that appendix.

(b) No certificate holder may use any contractor to perform a function listed in Appendix I to this part unless that contractor provides each of its employees performing that function for the certificate holder and his or her supervisor with the training specified in that appendix.

10. By adding a new § 121.455 to read as follows:

§ 121.455 Use of prohibited drugs.

(a) This section applies to persons who perform a function listed in Appendix I to this part for the certificate holder. For the purpose of this section, a person who performs such a function pursuant to a contract with the certificate holder is considered to be performing that function for the certificate holder.

(b) No certificate holder may knowingly use any person to perform, nor may any person perform for a certificate holder, any function listed in Appendix I to this part while that person has a prohibited drug, as defined in that appendix, in his or her system.

(c) Except as provided in paragraph (d) of this section, no certificate holder may knowingly use any person to perform, nor may any person perform for a certificate holder, any function listed in Appendix I to this part if that person failed a test required by that appendix for any employer.

(d) Paragraph (c) of this section does not apply to a person listed in section VIII.A.1. of Appendix I to this part who has successfully completed a rehabilitation program under that appendix and has received a recommendation for return to duty as a result of that rehabilitation program, and who has not failed a test required by that appendix for any employer after the first time he or she completed such a program.

11. By adding a new § 121.457 to read as follows:

§ 121.457 Testing for prohibited drugs.

(a) Each certificate holder shall test each of its employees who perform a

function listed in Appendix I to this part in accordance with that appendix.

(b) No certificate holder may use any contractor to perform a function listed in Appendix I to this part unless that contractor tests each employee performing such a function for the certificate holder in accordance with that appendix.

12. By adding a new Appendix I to Part 121 to read as follows:

Appendix I—Drug Testing Program

This appendix contains the standards and components that must be included in a drug testing program required by this chapter.

I. HHS Guidelines

Drug testing programs subject to this regulation shall be operated consistent with the "Scientific and Technical Guidelines for Federal Drug Testing Programs and Standards for Certification of Laboratories Engaged in Urine Drug Testing for Federal Agencies" proposed by the Department of Health and Human Services (52 FR 30638, August 14, 1987).[1] Terms and concepts referenced in this appendix shall have the same meaning as in those guidelines. Where the guidelines refer to "Federal agencies" or "the agency," this shall mean "the employer" for the purpose of this regulation. This appendix contains requirements for drug testing programs additional to those in the HHS guidelines. Drug testing programs governed by the regulation shall use only drug testing laboratories certified by the Department of Health and Human Services under the guidelines.

II. Definitions

For the purpose of this appendix, the following definitions apply:

"Accident" means an aircraft accident as defined in the regulations of the National Transportation Safety Board (49 CFR 830.2).

"Employee" is a person who performs, either directly or by contract, a function listed in section III of this appendix for a Part 121 or Part 135 certificate holder, a person conducting an operation for compensation or hire that currently is exempt from the requirements of Part 135 except operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958, or an air traffic control facility not operated by, or under contract with, the FAA or the U.S. military.

"Employer" is a Part 121 or Part 135 certificate holder, a person conducting an operation for compensation or hire that currently is exempt from the requirements of Part 135 except operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958, an air traffic control facility, or a contractor whose employees perform a function listed in section III of this appendix for such a certificate holder, person, or facility.

"Failing a drug test" means that the test result shows positive evidence of the presence of a prohibited drug in an employee's system.

"Passing a drug test" means that the test result does not show any positive evidence of the presence of a prohibited drug in an employee's system.

"Prohibited drug" means a substance specified in Schedule I or Schedule II of the Controlled Substances Act, 21 U.S.C. 801, 812 (1981 & 1987 Cum.P.P.), unless the drug is being used as authorized by a legal prescription or other exemption under Federal, state, or local law.

III. Employees Who Must Be Tested

Each person who performs a function listed in this section for an employer must be tested pursuant to the employer's drug testing program:

a. Flight crewmember duties.
b. Flight attendant duties.
c. Flight instruction or ground instruction duties.
d. Flight testing duties.
e. Aircraft dispatcher or ground dispatcher duties.
f. Aircraft maintenance or preventive maintenance duties.
g. Aviation security or screening duties.
h. Parachute rigging duties.
i. Air traffic control duties.

IV. Substances For Which Testing Must Be Conducted

Each employer shall test each employee who performs a function listed in section III of this appendix for evidence of marijuana, cocaine, opiates, phencyclidine (PCP), or amphetamines during each test required by section V of this appendix. An employer may test for any other prohibited drug.

V. Types of Drug Testing Required

Each employer shall conduct the following types of testing:

A. Preemployment Testing

No employer may hire any person to perform a function listed in section III of this appendix unless the applicant passes an initial test or confirmation test as specified in the HHS guidelines. The employer shall advise an applicant that preemployment testing will be conducted to determine the presence of any prohibited drug in the applicant's system. If the applicant fails either test, the applicant may withdraw his or her application for employment and the employer shall not retain records pertaining to the existence of the application or the reasons for its withdrawal.

B. Periodic Testing

Each employee required to undergo a medical examination under Part 67 of this chapter shall, as part of that examination, provide a urine sample to be tested for a prohibited drug in accordance with the procedures set forth in this appendix and the drug testing guidelines established by the Department of Health and Human Services.

C. Random Testing

In addition to periodic testing, each employer annually shall test randomly [a percentage of employees to be determined up to 125 percent] of all employees who perform a function listed in section III of this appendix. The employer shall select employees for random testing for the presence of a prohibited drug in an employee's system using a random number table or a computer-based, number generator that is matched with an employee's social security number or payroll identification number.

D. Post-accident Testing

Each employer shall test each employee who performs a function listed in section III of this appendix if that employee's performance either contributed to an accident or can not be completely discounted as a contributing factor to the accident. The test shall be administered within 24 hours after the accident. The employee shall submit to testing under this section. The decision not to administer a test under this section must be based on a determination, using the best information available at the time of the accident, that the employee's performance could not have contributed to the accident.

E. Testing Based on Reasonable Cause

Each employer shall test each employee who performs a function listed in section III of this appendix and who is reasonably suspected of using a prohibited drug. At least two of the employee's supervisors shall substantiate and concur in the decision to test an employee who is reasonably suspected of drug use. The decision to test must be based on a reasonable and articulable belief that the employee is using a prohibited drug on the basis of physical indications of probable drug use (e.g., the employee's manner of speech or physical appearance).

VI. Other Administrative Matters

A. Collection Records

All records related to the collection process, including all logbooks and certification statements, must be kept by the employer for at least 2 years. The employer must permit the Administrator to examine these records.

B. Employee Request To Retest a Specimen

The laboratory must reanalyze a specimen when requested by an employee. Each employee may make one request that a sample of the specimen be provided to another laboratory for testing. The original laboratory must follow chain-of-custody procedures. The employee must pay all handling and shipping costs associated with the transfer of the specimen to another laboratory.

C. Laboratory Inspections

The laboratory must permit pre-award inspections by the employer before the laboratory is awarded a testing contract and unannounced inspections, including

[1] A final version of the guidelines will be referenced in the final rule. FAA will include a notice of availability of the final guidelines in the final rule.

examination of any and all records, at any time, by the employer or the Administrator.

VII. Review of Drug Testing Results

The employer shall designate or appoint a medical review officer (MRO). If the employer does not have a qualified individual on staff to serve as MRO, the employer may contract for the provision of MRO services as part of its drug testing program.

A. MRO Qualifications

The MRO must be a licensed physician with knowledge of drug abuse disorders.

B. MRO Duties

The MRO shall perform the following functions for the employer:

1. Review the results of the employer's drug testing program before the results are reported to the employer and summarized for the FAA.

2. Evaluate an employee who has failed a confirmation test for referral to an EAP rehabilitation program.

3. Assist in determining when an employee involved in an EAP rehabilitation program should be returned to duty.

4. Review and interpret each confirmed positive test result in order to determine if there is an alternative medical explanation for the confirmed positive test result. The MRO shall perform the following functions as part of the review of a confirmed positive test result:

a. Conduct a medical interview with the employee.

b. Review the employee's medical history and any relevant biomedical factors.

c. Review all medical records made available by the employee to determine if a confirmed positive test resulted from legally prescribed medication.

d. Verify that the laboratory report and assessment are correct. The MRO shall be authorized to request that the original specimen be reanalyzed to determine the accuracy of the reported test result.

C. MRO Determinations

1. If the MRO determines, after appropriate review, that there is a legitimate medical explanation for the confirmed positive test result that is consistent with legal drug use, the MRO is not required to take further action.

2. If the MRO determines, after appropriate review, that there is no legitimate medical explanation for the confirmed positive test result that is consistent with legal drug use, the MRO shall refer the employee to an EAP, or to a personnel or administrative officer, for further proceedings in accordance with the employer's anti-drug program.

3. Based on a review of laboratory inspection reports, quality assurance and quality control data, and other drug test results, the MRO may conclude that a particular drug test result is scientifically insufficient for further action. Under these circumstances, the MRO should conclude that the test is negative for the presence of a prohibited drug in an employee's system.

VIII. Employee Assistance Program (EAP)

The employer shall provide an EAP for employees The employer may establish the EAP as a part of its internal personnel services or the employer may contract with an entity that will provide EAP services to an employee. Each EAP must include education and training on drug use for employees and the employer's supervisory personnel and an opportunity for rehabilitation as provided in this appendix.

A. EAP Rehabilitation Program (Option 1)

1. Each employer shall provide one rehabilitation opportunity for the following employees:

a. Each employee who voluntarily enrolls in an EAP.

b. Each employee who is identified as a drug user through random, periodic, or post-accident testing, or testing based on reasonable cause.

2. Each employer shall retain or rehire an employee who—

a. Has successfully completed his or her first rehabilitation program after voluntary enrollment or notification to the employee that he or she has failed a drug test;

b. Has not failed a drug test required by the employer's drug testing plan for employees who have completed rehabilitation; and

c. Has received a recommendation for return to duty as a result of that rehabilitation program.

3. Employees who are identified as drug users on the job are not required to be afforded an opportunity for rehabilitation or to be retained or rehired.

A. EAP Rehabilitation Program (Option 2)

1. Each employer shall provide one rehabilitation opportunity for the following employees:

a. Each employee who voluntarily enrolls in an EAP.

b. Each employee who is identified as a drug user through random or periodic testing.

2. Each employer shall retain or rehire an employee who—

a. Has successfully completed his or her first rehabilitation program after voluntary enrollment or notification to the employee that he or she has failed a random or periodic drug test;

b. Has not failed a drug test required by the employer's drug testing plan for employees who have completed rehabilitation; and

c. Has received a recommendation for return to duty as a result of that rehabilitation program.

3. Employees who are identified as drug users on the job or as a result of testing based on reasonable cause or post-accident testing required by this appendix are not required to be afforded an opportunity for rehabilitation or to be retained or rehired.

A. EAP Rehabilitation Program (Option 3)

1. Each employer shall provide one rehabilitation opportunity for each employee who voluntarily enrolls in an EAP.

2. Each employer shall retain or rehire an employee who—

a. Has successfully completed his or her first rehabilitation program after voluntary enrollment;

b. Has not failed a drug test required by the employer's drug testing plan for employees who have completed rehabilitation; and

c. Has received a recommendation for return to duty as a result of that rehabilitation program.

3. Employees who are identified as drug users on the job or as a result of testing required by this appendix are not required to be afforded an opportunity for rehabilitation or to be retained or rehired.

B. EAP Education Program

Each EAP education program must include at least the following elements: Display and distribution of informational material; display and distribution of a community service hot-line telephone number for employee assistance; and display and distribution of the employer's policy regarding drug use in the workplace.

C. EAP Training Program

Each EAP training program must be conducted annually for employees and employer's supervisory personnel. The training program must include at least the following elements: The effects and consequences of drug use on personal health, safety, and work environment; the manifestations and behavioral cues that may indicate drug use and abuse; and documentation of training given to employees and employer's supervisory personnel. EAP training programs for employees and supervisory personnel must consist of at least 60 minutes for each employee and supervisor each year.

IX. Employer's Drug Testing Plan

A. Each employer shall submit a drug testing plan to the FAA for review by [120 days after the effective date of this rule], 120 days after issuance of a certificate under Part 121 or Part 135 to the employer, or 120 days after beginning operations listed in § 135.1(b) for compensation or hire except operations of foreign civil aircraft navigated within the United States pursuant to Part 375 or emergency mail service operations pursuant to section 405(h) of the Federal Aviation Act of 1958, whichever is later. Each employer who is a contractor who provides employees who perform a function listed in section II of this appendix for an employer shall submit a drug testing plan by [120 days after the effective date of this rule] or within 120 days after award of a contract, whichever is later.

B. The plan must specify the methods by which the employer will comply with the periodic and random testing requirements of this appendix. The plan must provide the name and address of the laboratory which has been selected by the employer for analysis of the specimens collected during the drug testing program.

C. The plan must specify the procedures and personnel the employer will use to ensure that determination is made as to the veracity of test results and possible legitimate explanation for an employee failing a test.

D. The employer may consider the drug testing plan to be acceptable to the Administrator unless notified to the contrary by the FAA.

E. The employer's drug testing plan must be effective and implemented by 180 days after

the deadline for submitting the program to the FAA.

X. Reporting Results of Drug Testing Program

A. Each employer shall provide a written semiannual report and a written annual report to the FAA summarizing the results of its drug testing program.

B. Each report shall summarize and correlate the following information for each type of testing required, separated as follows:

1. Function performed by the employees tested.

2. Prohibited drug used by the employee.

3. Disposition of employees who failed the test (e.g., termination, rehabilitation, leave without pay).

PART 135—AIR TAXI OPERATORS AND COMMERCIAL OPERATORS

13. The authority citation for Part 135 continues to read as follows:

Authority: 49 U.S.C. 1354(a), 1355, 1421–1431, and 1502; 49 U.S.C. 106(g) (Revised, Pub. L. 97–449, January 12, 1983).

14. By revising the introductory text of § 135.1 (b) and adding a new paragraph (c) to read as follows:

§ 135.1 Applicability.

* * * * *

(b) Except as provided in paragraph (c) of this section, this part does not apply to—

* * * * *

(c) For the purpose of §§ 135.249, 135.251, and 135.353, "operator" means any person conducting an operation listed in paragraph (b) of this section for compensation or hire except operation of foreign civil aircraft navigated within the United States pursuant to Part 375 described in paragraph (b)(8) and emergency mail service operation pursuant to section 405(h) of the Federal Aviation Act of 1958 described in paragraph (b)(9). Each operator and each employee of an operator shall comply with the requirements of §§ 135.249, 135.251, and 135.353 of this part.

15. By adding a new § 135.249 to read as follows:

§ 135.249 Use of prohibited drugs.

(a) This section applies to persons who perform a function listed in Appendix I to Part 121 of this chapter for a certificate holder or an operator. For the purpose of this section, a person who performs such a function pursuant to a contract with the certificate holder or the operator is considered to be performing that function for the certificate holder or the operator.

(b) No certificate holder or operator may knowingly use any person to perform, not may any person perform for a certificate holder or an operator, any function listed in Appendix I to Part 121 of this chapter while that person has a prohibited drug, as defined in that appendix, in his or her system.

(c) Except as provided in paragraph (d) of this section, no certificate holder or operator may knowingly use any person to perform, nor may any person perform for a certificate holder or an operator, any function listed in Appendix I to Part 121 of this chapter if that person has failed a test required by that appendix for any employer.

(d) Paragraph (c) of this section does not apply to a person listed in section VIII.A.1. of Appendix I to Part 121 of this chapter who has successfully completed a rehabilitation program under that appendix and has received a recommendation for return to duty as a result of the rehabilitation program, and who has not failed a test required by that appendix for any employer after the first time he or she completed such a program.

16. By adding a new § 135.251 to read as follows:

§ 135.251 Testing for prohibited drugs.

(a) Each certificate holder or operator shall test each of its employees who perform a function listed in Appendix I to Part 121 of this chapter in accordance with that appendix.

(b) No certificate holder or operator may use any contractor to perform a function listed in Appendix I to Part 121 of this chapter unless that contractor tests each employee performing such a function for the certificate holder or operator in accordance with that appendix.

17. By adding a new § 135.353 to read as follows:

§ 135.353 Prohibited drugs.

(a) Each certificate holder or operator shall provide each employee performing a function listed in Appendix I to Part 121 of this chapter and his or her supervisor with the training specified in that appendix.

(b) No certificate holder or operator may use any contractor to perform a function specified in Appendix I to Part 121 of this chapter unless that contractor provides each of its employees performing that function for the certificate holder or the operator and his or her supervisor with the training specified in that appendix.

Issued in Washington, DC, on March 3, 1988.

T. Allan McArtor,

Administrator.

[FR Doc. 88–5402 Filed 3–9–88; 11:34 am]

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Federal Register

Monday
March 14, 1988

Part V

Department of Education

34 CFR Part 300

Assistance to States for Education of Handicapped Children; Notice of Proposed Rulemaking

DEPARTMENT OF EDUCATION

34 CFR Part 300

Assistance to States for Education of Handicapped Children

AGENCY: Department of Education.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Secretary proposes to amend the regulations implementing the Assistance to States for Education of Handicapped Children program authorized by Part B of the Education of the Handicapped Act (Part B).

The amendments are needed to implement amendments to Part B included in the Education of the Handicapped Act Amendments of 1986 (1986 Amendments). These proposed regulations would: Require that State plans include sections dealing with interagency agreements and personnel standards; clarify the responsibility of educational and other agencies to provide special education and related services; add nonsupplanting requirements at the State level; permit the State to use additional Part B set-aside funds for monitoring and complaint investigations; modify the funding formula that the Secretary uses for calculating Part B grants; and alter program requirements for the Secretary of the Interior.

DATE: Comments must be received on or before June 13, 1988.

ADDRESSES: All comments concerning these proposed regulations should be addressed to Dr. Paul Chassy, Acting Branch Chief, Program Administration Branch, Division of Assistance to States, Office of Special Education Programs, Department of Education, 400 Maryland Avenue SW., (Switzer Building, Room 3620—MES 2313) Washington, DC 20202.

A copy of any comments that concern information collection requirements should also be sent to the Office of Management and Budget at the address listed in the Paperwork Reduction Act section of this preamble.

FOR FURTHER INFORMATION CONTACT: Lucille Sleger, Program Administration Branch, Division of Assistance to States, Office of Special Education Programs, Department of Education, 400 Maryland Avenue SW., (Switzer Building, Room 3622—MES 2313) Washington, DC 20202; Telephone: (202) 732-1104.

SUPPLEMENTARY INFORMATION: Part B of the Education of the Handicapped Act (20 U.S.C. 1411 *et seq.*), as amended, authorizes formula grants to States and, through States, to local educational agencies and intermediate educational units to assist them in the education of handicapped children. The purposes of the Education of the Handicapped Act are: to ensure that all handicapped children have available to them a free appropriate public education which emphasizes special education and related services designed to meet their unique needs; to ensure that the rights of children who are handicapped and their parents or guardians are protected; to assist States and localities to provide for the education of children who are handicapped; and to assess and ensure the effectiveness of efforts to educate children who are handicapped.

The Education of the Handicapped Act Amendments of 1986, Pub. L. 99-457, amended several parts of the Education of the Handicapped Act, including Part B. These proposed regulations implement changes made to Part B by the 1986 Amendments, as described below.

I. Funding and SEA Responsibility

Existing regulations (§ 300.600) require that all relevant programs in a State be under the general supervision of the State educational agency (SEA). In the 1986 Amendments, Congress further clarified the relationship among public agencies in a State, particularly with respect to the provision of a free appropriate public education to children with handicapping conditions. The 1986 Amendments address the availability of services and funding from public agencies other than the SEA. These statutory amendments are reflected in the proposed regulations, as follows.

Prior to the 1986 Amendments, States were prohibited from using Part B funds to supplant State and local funds expended for special education and related services for children who have handicapping conditions. The 1986 Amendments prohibit States from using Part B funds to supplant Federal, as well as State and local, funds expanded for this purpose. This statutory change is reflected in proposed § 300.150. In that section, "Federal" funds is defined to mean Federal funds other than those provided under Part B. For example, it would be impermissible to use Part B funds to supplant Federal funds under the control of agencies other than educational agencies. This proposed nonsupplanting regulation is applicable to State educational agencies and, consistent with the structure of the statute, is distinct from the current § 300.230, which is applicable to local educational agencies. The Secretary particularly invites comment on this provision of the proposed regulations.

Existing regulations at § 300.600 include interagency agreements as a possible way of implementing an SEA's general supervision requirement. The 1986 Amendments require that State plans include policies and procedures for developing and implementing interagency agreements between the SEA and "other appropriate State and local agencies." This is reflected in § 300.152 of the proposed regulations which also reflects the Department's understanding of section 613(a)(13) of the statute that "other appropriate" agencies are all those State and local agencies other than the SEA that provide or pay for special education or related services for children with handicapping conditions. The regulations would require the SEA to describe the role that each of those agencies will play in providing or paying for those services. As required by statute, the proposed regulations would also require that SEA policies and procedures provide for the development and implementation of interagency agreements that define the responsibilities of each agency and establish mechanisms for resolving interagency disputes.

The 1986 Amendments state that Part B shall not be construed to limit the responsibilities of agencies other than educational agencies for providing or paying for services provided to children under Part B. This is reflected in a proposed new § 300.600(c). The 1986 Amendments also state that Part B shall not be construed to permit a State to reduce assistance or alter eligibility under programs supported by Federal Medicaid and Maternal and Child Health programs. A new § 300.601 is added to reflect the statutory amendments. This is intended to ensure that no child is treated differently under these two programs because the child is receiving services under an IEP, or for any other reason related to the existence or applicability of Part B.

II. Preschool Services

A new second paragraph is proposed as an addition to the comment following § 300.552. The propose guideline sets forth the general requirements regarding a public agency's responsibility for the placement of children who have handicapping conditions in the least restrictive environment. The proposed addition to the comment provides suggestions to recipients of Part B funds on how they might meet those requirements when serving preschool children with handicaps if the agency does not generally provide education to nonhandicapped children who are age three, four, or five. This guidance is provided in response to the increased emphasis in Part B, as amended by Pub.

L. 99–457, for extending and expanding programs for preschool children with handicapping conditions.

III. Personnel Standards

Prior to the 1986 Amendments, the regulations required that State plans include a comprehensive system of personnel development, including procedures to ensure that personnel are qualified, as defined in § 300.12. The 1986 Amendments added a statutory provision requiring that State plans include policies and procedures to ensure that necessary personnel are "appropriately and adequately prepared and trained." The regulatory proposal for a new § 300.153 incorporates the statutory requirement for policies and procedures, and the statutory requirement that, where there is an inconsistency between the program standard applicable to persons providing services under the State plan and the highest requirements in the State applicable to a profession or discipline, the State plan must describe the steps to be taken to require the hiring or retraining of persons to meet appropriate standards.

Inconsistencies between the standard for service providers under the Part B program and the highest requirement in the State exist where, for example, the program standard requires a lower academic credential than is required by another State agency for professional practice in a setting other than a school setting, or where a program service can be provided under a temporary certificate issued to a person who does not meet the generally applicable standard.

The statutory provision on personnel standards is virtually the same for both this part and the program for infants and toddlers with handicaps under Part H of the Act. Because the language is so similar, the Secretary originally intended to include virtually identical provisions in the NPRMs for both programs. However, since the Part H NPRM was published, the Department has received numerous comments expressing concerns about a provision in the personnel standards section of that NPRM related to "alternative standards." (See proposed 34 CFR Part 303, at FR 44360, November 18, 1987.)

On the basis of those comments, the Secretary has elected not to include the "alternative standards" provision in the NPRM for this part. The Secretary recognizes that this change does not address all of the concerns raised by commenters on the Part H NPRM. The Secretary will carefully consider all of the comments received both on the Part H NPRM and the NPRM for this part in preparing the final regulations for both parts.

IV. Grants to the Secretary of the Interior

The 1986 Amendments state the terms and conditions of grants to the Secretary of the Interior for the education of handicapped Indian children on reservations served by elementary and secondary schools operated by the Department of the Interior. These conditions have been incorporated into § 300.260 and § 300.709 of the proposed regulations. In interpreting the statutory requirements, § 300.260 of the proposed regulations lists the parts of sections 612 and 613 that apply to applications for grants submitted by the Secretary of the Interior.

The 1986 Amendments also increased the percentage of Part B funds available to the Secretary of the Interior from up to one percent to a fixed 1.25 percent. This is reflected in the proposed revision to § 300.709(b).

V. State Entitlement and Use of Funds

The 1986 Amendments include revisions which allow SEAs to use additional Part B set-aside funds to pay for increases in the costs of State-level monitoring activities and complaint investigations. The authorization for this use of funds and the statutory limitation on it have been added to § 300.370(a)(2) in the proposed regulations.

The 1986 Amendments also state that an SEA may count children who have handicapping conditions aged three through five for funding purposes only if the SEA meets the requirements under section 619 of the Education of the Handicapped Act. (The requirements of section 619 were also amended in the 1986 Amendments.) The treatment of children aged three through five in the calculation of Part B grants is, therefore, revised in § 300.701 of these proposed regulations.

Similarly, a proposed revision of § 300.702 reflects a statutory change in the application of the "12% cap" on counting children with handicapping conditions for Federal funding purposes.

Executive Order 12291

These regulations have been reviewed in accordance with Executive Order 12291. They are not classified as major because they do not meet the criteria for major regulations established in the order.

Regulatory Flexibility Act Certification

The Secretary certifies that these proposed regulations would not have a significant economic impact on a substantial number of small entities.

The small entities that would be affected by these regulations are small local educational agencies (LEAs) receiving Federal financial assistance under this program. However, the regulations would not have a significant economic impact on small LEAs because the regulations would not impose excessive regulatory burdens or require unnecessary Federal supervision. The regulations would impose minimal requirements to ensure proper expenditure of program funds.

Paperwork Reduction Act of 1980

Sections 300.152 and 300.153 contain information collection requirements. As required by the Paperwork Reduction Act of 1980, the Department of Education will submit a copy of these sections to the Office of Management and Budget (OMB) for its review. (44 U.S.C. 3504(h))

Organizations and individuals desiring to submit comments on the information collection requirements should direct them to the Office of Information and Regulatory Affairs, Room 3002, New Executive Office Building, Washington, DC 20503 Attention: James D. Houser.

Intergovernmental Review

This program is subject to the requirements of Executive Order 12372 and the regulations in 34 CFR Part 79. The objective of the Executive Order is to foster an intergovernmental partnership and a strengthened federalism by relying on processes developed by State and local governments for coordination and review of proposed Federal financial assistance.

In accordance with the order, this document is intended to provide early notification of the Department's specific plans and actions for this program.

Invitation to Comment

Interested persons are invited to submit comments and recommendations regarding these proposed regulations.

All comments submitted in response to these proposed regulations will be available for public inspection, during and after the comment period, in Room 3622, Switzer Building, 330 C Street SW., Washington, DC 20202, between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday of each week except Federal holidays.

To assist the Department in complying with the specific requirements of Executive Order 12291 and the Paperwork Reduction Act of 1980 and their overall requirement of reducing regulatory burden, the Secretary invites

comment on whether there may be further opportunities to reduce any regulatory burdens found in these proposed regulations.

List of Subjects in 34 CFR Part 300

Administrative practice and procedures, Education, Education of handicapped, Grant programs—education, Privacy, Private schools, Reporting and recordkeeping requirements.

(Catalog of Federal Domestic Assistance Number 84.027; Assistance to States for Education of Handicapped Children)

Dated: January 11, 1988.

William J. Bennett,

Secretary of Education.

The Secretary proposes to amend Part 300 of Title 34 of the Code of Federal Regulations as follows:

PART 300—ASSISTANCE TO STATES FOR EDUCATION OF HANDICAPPED CHILDREN

1. The authority citation for Part 300 continues to read as follows:

Authority: 20 U.S.C. 1411–1420, unless otherwise noted.

* * * * *

2. Subpart B is amended by adding a new § 300.150 to read as follows:

§ 300.150 State-level nonsupplanting.

Each program plan must provide assurance satisfactory to the Secretary that funds provided under this part will be used so as to supplement and increase the level of Federal (other than funds available under this part), State, and local funds—including funds that are not under the direct control of State or local educational agencies—expended for special education and related services provided to handicapped children under this part and in no case to supplant those Federal (other than funds available under this part), State, and local funds unless a waiver is granted in accordance with § 300.589.

(Authority: 20 U.S.C 1413(a)(9))

Comment. The State must assure that EHA–B funds will be used to supplement and not supplant other Federal, as well as State and local, funds (including funds not under the control of educational agencies) expended for appropriate services provided to handicapped children. States may not use EHA–B funds to satisfy a financial commitment for services that would have been paid for by a health or other agency pursuant to policy or practice but for the fact that these services are now included in handicapped children's individualized education programs. (H. Rep. 99–860, pp. 21–22 (1986))

3. Subpart B is further amended by adding new §§ 300.152 and 300.153 to read as follows:

§ 300.152 Interagency agreements.

(a) Each State plan must set forth policies and procedures for developing and implementing interagency agreements between—

(1) The State educational agency; and

(2) All other State and local agencies that provide or pay for special education or related services for handicapped children.

(b) The policies and procedures referred to in paragraph (a) of this section must—

(1) Describe the role that each of those agencies plays in providing or paying for special education or related services for handicapped children; and

(2) Provide for the development and implementation of interagency agreements that—

(i) Define the financial responsibility of each agency for providing handicapped children with free appropriate public education;

(ii) Establish procedures for resolving interagency disputes among agencies that are parties to the agreements; and

(iii) Establish procedures under which local educational agencies may initiate proceedings in order to secure reimbursement from agencies that are parties to the agreement or otherwise implement the provisions of the agreement.

(Authority: 20 U.S.C. 1413(a)(13))

§ 300.153 Personnel standards.

(a)(1) Each State plan must include policies and procedures relating to the establishment and maintenance of standards to ensure that personnel necessary to carry out the purposes of this part are appropriately and adequately prepared and trained.

(2) The standards required by paragraph (a)(1) of this section must be consistent with any State approved or recognized certification, licensing, or other comparable requirements which apply to the area in which a person is providing special education or related services.

(b) To the extent that a State's standards are not based on the highest requirements in the State applicable to a specific profession or discipline, the State plan must include the steps the State is taking to require the retraining or hiring of personnel that meet appropriate professional requirements in the State.

(c)(1) In meeting the requirements of paragraphs (a) and (b) of this section, a determination must be made about the status of personnel standards in the State. That determination must be based on current information that accurately describes, for each profession or discipline in which personnel are providing special education or related services, whether the applicable standards are consistent with the highest requirements in the State for that profession or discipline.

(2) The information in paragraph (c)(1) of this section must be on file in the State educational agency.

(d) In identifying the "highest requirements in the State" for purposes of this section, the requirements of all State statutes and the rules of all State agencies must be considered.

(Authority: 20 U.S.C. 1413(a)(14))

Comment. Under this part, States are required to identify the "highest requirements in the State" for the purposes of hiring or retraining personnel. This means, for example, that if standards for physical therapists are issued by both the SEA and a State licensing board, the standards of the SEA and the State licensing board must be compared to identify the "highest requirements in the State."

For instance, if a State has specific certification requirements in the area of seriously emotionally disturbed (SED) but, because of a severe shortage, the SEA in the past has issued emergency certificates to teachers who have not been trained in that area, the SEA's policies and procedures in the State plan would include: (1) A description of the steps the State is taking to retrain or hire persons that meet appropriate professional requirements (e.g., full SEA certification) in that area; and (2) the timelines for accomplishing those steps. In order to address the shortage of teachers in the area of SED, while taking steps that will lead toward full certification of those teachers, one step that the SEA might include in the State plan would be to limit the issuance of temporary certificates for a fixed term (e.g., 3 years), which would be (1) nonrenewable, and (2) given only to teachers who are continuously enrolled in an approved course of study leading toward full certification.

4. Section 300.260 is revised to read as follows:

§ 300.260 Submission of application; approval.

(a) In order to receive a grant under this part, the Secretary of the Interior shall submit an application that—

(1) Meets the requirements in sections 612(1), 612(2)(A), 612(2)(C)–(E), 612(4), 612(5), 612(6), and 612(7) of the Act;

(2) Meets the requirements in sections 613(a), 613(b), 613(c), and 613(e) of the Act;

(3) Meets the requirements of section 614(a) of the Act;

(4) Meets the requirements of this part that implement the sections of the Act

listed in paragraphs (a)(1) through (a)(3) of this section; and

(5) Includes an assurance that there have been public hearings on the application, adequate notice of the public hearings, and an opportunity for members of tribes, tribal governing bodies, and designated local school boards to comment on the application before the adoption of the policies, programs, and procedures required under sections 612, 613, and 614(a) of the Act.

(b) Sections 300.580–300.586 apply to grants available to the Secretary of the Interior under this part.

(Authority: 20 U.S.C. 1411(f))

5. Section 300.370 is amended by revising the section title and paragraph (a) to read as follows:

§ 300.370 Use of State agency allocations.

(a) The State may use the portion of its allocation that it does not use for administration under §§ 300.620 through 300.621—

(1) For support services and direct services in accordance with the priority requirements under §§ 300.320 through 300.324; and

(2) For the administrative costs of the State's monitoring activities and complaint investigations, to the extent that these costs exceed the administrative costs for monitoring and complaint investigations incurred during fiscal year 1985.

* * * * *

6. Section 300.552 is amended by adding a new second paragraph in the comment to read as follows:

§ 300.552 Placements.

* * * * *

The requirements of § 300.552, as well as the other requirements of §§ 300.550 through 300.556, apply to all preschool handicapped children who are entitled to receive a free appropriate public education. Public agencies that provide preschool programs for non-handicapped children must ensure that the requirements of § 300.552(c) are met. Public agencies that do not operate programs for non-handicapped preschool children are not required to initiate such programs solely to satisfy the requirements regarding placement in the least restrictive environment embodied in §§ 300.550 through 300.556. For these public agencies, some alternative methods for meeting the requirements of §§ 300.550 through 300.556 include:

(1) Linking (even part-time) the program for preschool handicapped children to other preschool programs operated by public agencies (such as Head Start);

(2) Placing handicapped children in private school programs for non-handicapped preschool children or private school preschool programs that integrate handicapped and non-handicapped children; and

(3) Locating classes for handicapped preschool children in regular elementary schools.

In each case, the public agency must ensure that the placement is based upon each child's individualized education program and meets all of the other requirements of § 300.552.

* * * * *

7. The center heading preceding § 300.600 is revised to read as follows:

General

8. Section 300.600 is amended by adding a new paragraph (c) to read as follows:

§ 300.600 Responsibility for all educational programs.

* * * * *

(c) This part may not be construed to limit the responsibility of agencies other than educational agencies for providing or paying some or all of the costs of a free appropriate public education to handicapped children in the State.

(Authority: 20 U.S.C. 1412(6))

9. Subpart F is amended by adding a new § 300.601 to read as follows:

§ 300.601 Relation of the EHA-B to other Federal programs.

This part may not be construed to permit a State to reduce medical and other assistance available to handicapped children, or to alter a handicapped child's eligibility, under Title V (Maternal and Child Health) or Title XIX (Medicaid) of the Social Security Act, to receive services that are also part of a free appropriate public education.

(Authority: 20 U.S.C. 1413(e))

10. Section 300.701 is amended by revising paragraph (a) to read as follows and removing and reserving paragraph (b).

§ 300.701 State entitlement, formula.

(a) The Secretary calculates the maximum amount of the grant to which a State is entitled under section 611 of the Act in any fiscal year as follows:

(1) If the State is eligible for a grant under section 619 of the Act, the maximum entitlement is equal to the number of handicapped children aged three through 21 in the State who are receiving special education and related services, multiplied by 40 percent of the average per pupil expenditure in public elementary and secondary schools in the United States.

(2) If the State is not eligible for a grant under section 619 of the Act, the maximum entitlement is equal to the number of handicapped children aged six through 21 in the State who are receiving special education and related services, multiplied by 40 percent of the average per pupil expenditure in public elementary and secondary schools in the United States.

(Authority: 20 U.S.C. 1411(a)(1))

(b) [Reserved]

* * * * *

11. Section 300.702 is amended by revising paragraphs (a)(1), (a)(3), and (b) and adding a new paragraph (a)(2) to read as follows:

§ 300.702 Limitations and exclusions.

(a) In determining the amount of a grant under § 300.701—

(1) If a State serves all handicapped children aged three through five in the State, the Secretary does not count handicapped children aged three through 17 in the State to the extent that the number of those children is greater than 12 percent of the number of all children aged three through 17 in the State;

(2) If a State does not serve all handicapped children aged three through five in the State, the Secretary does not count handicapped children aged five through 17 to the extent the number of those children is greater than 12 percent of the number of all children aged five through 17 in the State; and

(3) The Secretary does not count handicapped children who are counted under section 146 of Title I of the Elementary and Secondary Education Act, as consolidated by section 554(a)(2)(B) of Chapter 1 of the Education Consolidation and Improvement Act of 1981.

(b) For the purposes of paragraph (a) of this section, the number of children aged three through 17 and five through 17 in any State is determined by the Secretary on the basis of the most recent satisfactory data available.

(Authority: 20 U.S.C. 1411(a)(5))

12. Section 300.709 is amended by revising paragraph (b) to read as follows:

§ 300.709 Payments to the Secretary of Interior.

* * * * *

(b) The amount of those payments for any fiscal year is 1.25 percent of the aggregate amounts available to all States for that fiscal year under this part.

(Authority: 20 U.S.C. 1411(f)(1))

[FR Doc. 88–5545 Filed 3–11–88; 8:45 am]

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Federal Register

Monday
March 14, 1988

Part VI

Department of Education

34 CFR Part 653

Paul Douglas Teacher Scholarship Program; Withdrawal of Notice of Proposed Rulemaking

Regulations

DEPARTMENT OF EDUCATION

34 CFR Part 653

Paul Douglas Teacher Scholarship Program

AGENCY: Department of Education.

ACTION: Withdrawal of notice of proposed rulemaking.

SUMMARY: The Secretary withdraws the Notice of Proposed Rulemaking (NPRM) for the Paul Douglas Teacher Scholarship Program. The Secretary takes this action to inform the public that development of final regulations based on this NPRM is unnecessary.

EFFECTIVE DATE: The NPRM is withdrawn effective March 14, 1988.

FOR FURTHER INFORMATION CONTACT: Bonnie Gold, Program Specialist, State Student Incentive Grant Program, Office of Postsecondary Education, U.S. Department of Education (Room 4018, ROB–3), 400 Maryland Avenue SW., Washington, DC 20202. Telephone (202) 732–4507.

SUPPLEMENTARY INFORMATION: The Secretary of Education published in the **Federal Register** on November 25, 1987 (52 FR 45290), an NPRM governing the interest rates to be charged to scholarship recipients under the Paul Douglas Teacher Scholarship Program.

In the NPRM, interested parties were invited to submit their comments regarding the interest rate formula contained in § 653.42(c) of the regulations to the Secretary by January 11, 1988. The Secretary did not receive any comments. Since the interest rate formula was incorporated in the final regulations for the Paul Douglas Teacher Scholarship Program that were also published in the **Federal Register** on November 25, 1987 (52 FR 45284), the Secretary hereby withdraws the NPRM.

(Catalog of Federal Domestic Assistance Number 84.176: Paul Douglas Teacher Scholarship Program)

Dated: March 9, 1988.

William J. Bennett,

Secretary of Education.

[FR Doc. 88–5547 Filed 3–11–88; 8:45 am]

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