CHAPTER X—AGRICULTURAL MARKETING SERVICE (MARKETING AGREEMENTS AND ORDERS; MILK) DEPARTMENT OF AGRICULTURE

[Milk Order No. 30]

PART 1030—MILK IN THE CHICAGO REGIONAL MARKETING AREA

Temporary Revision of Shipping Percentage

This temporary revision is issued pursuant to the provisions of the Agricultural Marketing Agreement Act of 1937, as amended (7 U.S.C. 601 *et seq.*), and the provisions of § 1030.11(b)(6) of the order regulating the handling of milk in the Chicago Regional marketing area.

Notice of proposed rulemaking was published in the Federal Register (38 FR 35005) concerning a proposed increase in the supply plant shipping percentage for the month of January 1974. Interested persons were afforded an opportunity to file written data, views, and arguments thereon.

After consideration of all relevant material, including the proposal set forth in the aforesaid notice, data, views, and arguments filed thereon, and other available information, it is hereby found and determined that for the month of January 1974 the supply plant shipping percentage of 20 percent that is applicable during the months of January, February and March to a plant that was a pool plant during each of the preceding months of August through December shall be increased to 25 percent.

Pursuant to the provisions of § 1030.11(b)(6) the supply plant shipping percentages set forth in § 1030.11(b)(4) shall be increased or decreased by up to 10 percentage points during the months of August–March if necessary to obtain needed shipments or to prevent uneconomic shipments.

Associated Milk Producers Incorporated (AMPI), a large regional cooperative association representing a substantial proportion of the producers supplying the Chicago Regional market, requested that the Director of the Dairy Division investigate the need to increase the supply plant shipping percentage for the month of January 1974. AMPI states that an upward revision (from 20 to 25) in the supply plant shipping percentage will be necessary to assure that fluid milk bottling plants in the Chicago metropolitan area will obtain needed shipments to fulfill their bottling requirements.

To fulfill their fluid milk requirements, distributing plants obtain a major portion of their milk supplies from supply plants, since about three-fourths of the market's milk supply is assembled at supply plants. In November 1973, for example, receipts of producer milk totaled 424 million pounds at supply plants and 142 million pounds at distributing plants. Shipments of milk from pool supply plants to pool distributing plants amounted to 230 million pounds during November or 54.3 percent of total receipts at supply plants.

Total milk supplies on the market have been declining since November 1972. Each month since then milk production has been significantly below the corresponding month in the previous year. In November 1973, 566 million pounds of milk were pooled under the order compared to 585 million pounds in November 1972, a reduction of 19 million pounds or 3.3 percent from the same month the previous year.

Shipments from supply plants to distributing plants have been greater in recent months than during corresponding months in 1972. In August through November 1973, shipments of supply plant milk averaged 223 million pounds per month compared to 210 million pounds per month during the same period of 1972. The percentage of supply plant milk shipped to distributing plants is also up from last year. During August through November of 1973, the percent of receipts shipped averaged 48.1 percent per month compared to 43.5 percent per month during August through November of 1972.

In response to a requested increase in the shipping percentage for the month for December, an upward increase of 5 percent (from 30 to 35) was authorized by the Acting Director of the Dairy Division on November 30, 1973 (38 FR 33455).

A similar 5 percent increase will be needed for the month of January. Shipments of supply plant milk to pool distributing plants averaged 33.7 percent of total supply plant receipts in January 1972 and increased to 34.1 percent in January 1973.

Actual supply plant shipments as a percentage of plant receipts have exceeded the minimum shipping percentage specified in the order by an average of 10.6 percent during the months of August through November of 1973. An increase of 5 percentage points in the minimum shipping percentage to 25 percent of plant receipts for January would provide a comparable margin between the minimum level for pool qualification and the expected actual marketwide average percentage of supply plant milk needed to be shipped.

It is appropriate that an allowance for flexibility in milk procurement as among supply plants be provided under the order to enable the use of milk supplies at supply plants located nearest to Chicago before requiring shipments from the more distant plants. It would be uneconomic to require milk shipments from the more distant supply plants when milk closer to Chicago is available. However, there is extensive competition for milk supplies throughout the production area for use in cheese, which threatens to attract milk supplies away from the Grade A fluid milk market.

It is concluded that it is necessary to increase the shipping percentage by 5 percentage points for the month of January 1974 to obtain needed shipments.

It is hereby found and determined that thirty days' notice of the effective date hereof is impractical, unnecessary and contrary to the public interest in that:

(a) This temporary revision is necessary to reflect current marketing conditions and to maintain orderly marketing conditions in the marketing area in that during January 1974 it will encourage supply plants to make the needed shipments to pool distributing plants to fulfill the market's requirements for milk in fluid use;

(b) This temporary revision does not require of persons affected substantial or extensive preparation prior to the effective date; and

(c) Notice of proposed rule making was given interested parties and they were afforded opportunity to file written data, views or arguments concerning this temporary revision.

Therefore, good cause exists for making this temporary revision effective January 1, 1974.

It is therefore ordered, That the aforesaid provision of the order is hereby revised for January 1974.

(Secs. 1–19, 48 Stat. 31, as amended; 7 U.S.C. 601–674.)

Effective date: January 1, 1974.

Signed at Washington, D.C., on December 28, 1973.

P. W. HALNON,
Acting Director, Dairy Division.

[FR Doc.74–339 Filed 1–3–74; 8:45 am]

Title 9—Animals and Animal Products

CHAPTER I—ANIMAL AND PLANT HEALTH INSPECTION SERVICE, DEPARTMENT OF AGRICULTURE

SUBCHAPTER C—INTERSTATE TRANSPORTATION OF ANIMALS (INCLUDING POULTRY) AND ANIMAL PRODUCTS; EXTRAORDINARY EMERGENCY REGULATION OF INTRASTATE ACTIVITIES

PART 78—BRUCELLOSIS

Subpart D—Designation of Modified Certified Brucellosis Areas, Specifically Approved Stockyards, and Slaughtering Establishments

MODIFIED CERTIFIED BRUCELLOSIS AREAS

The following counties were deleted from the list of Modified Certified Brucellosis Areas in 9 CFR 78.13 on the specified dates: Barton, Bates, Cape Girardeau and Taney Counties in Missouri on November 28, 1973; Beadle and Hutchinson Counties in South Dakota on November 28, 1973; and La Salle County in Texas on November 28, 1973. Since said dates, it has been determined that these counties again come within the definition of § 78.1(i); and therefore, they have been redesignated as Modified Certified Brucellosis Areas.

Pursuant of § 78.16 of the regulations (9 CFR 78.16) issued under provisions of the Act of May 29, 1884, as amended; the Act of February 2, 1903, as amended; the Act of March 3, 1905, as amended; and the Act of July 2, 1962 (21 U.S.C. 111–113, 114a–1, 115, 117, 120, 121, 125, 134b, 134f), § 78.13 of said regulations designating Modified Certified Brucellosis Areas is hereby revised to read as follows:

§ 78.13 Modified Certified Brucellosis Areas.

(a) All States of the United States are hereby designated as Modified Certified Brucellosis Areas except Missouri and South Dakota.

(b) Each of the following States is hereby designated as a Modified Certified Brucellosis Area except for the counties named:

(1) Missouri except Sullivan County.

(2) South Dakota except Shannon County.

(Secs. 4–7 23 Stat. 32, as amended; secs. 1 and 2, 32 Stat. 791–792, as amended; sec. 3, 33 Stat. 1265, as amended; sec. 2, 65 Stat. 693; and secs. 3 and 11, 76 Stat. 130, 132; 21 U.S.C. 111–113, 114a–1, 115, 117, 120, 121, 125, 134b, 134f, 37 FR 28464, 28477, 38 FR 19141, 9 CFR 78.16.)

Effective date. The foregoing amendment shall become effective January 4, 1974.

The amendment imposes certain restrictions necessary to prevent the spread of brucellosis in cattle and relieves certain restrictions presently imposed. It should be made effective promptly in order to accomplish its purpose in the public interest and to be of maximum benefit to persons subject to the restrictions which are relieved. It does not appear that public participation in this rulemaking proceeding would make additional relevant information available to the Department.

Accordingly, under the administrative procedure provisions of 5 U.S.C. 553, it is found upon good cause that notice and other public procedure with respect to the amendment are impracticable, unnecessary, and contrary to the public interest, and good cause is found for making it effective less than 30 days after publication in the FEDERAL REGISTER.

Done at Washington, D.C., this 28th day of December 1973.

J. M. HEJL,
Acting Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Service.

[FR Doc.74–336 Filed 1–3–74;8:45 am]

SUBCHAPTER D—EXPORTATION AND IMPORTATION OF ANIMALS (INCLUDING POULTRY) AND ANIMAL PRODUCTS

PART 92—IMPORTATION OF CERTAIN ANIMALS AND POULTRY AND CERTAIN ANIMAL AND POULTRY PRODUCTS; INSPECTION AND OTHER REQUIREMENTS FOR CERTAIN MEANS OF CONVEYANCE AND SHIPPING CONTAINERS THEREON

Restrictions on Cattle From Mexico

State of considerations. On October 26, 1973, there was published in the FEDERAL REGISTER (38 FR 29603), a proposed amendment to the regulations in 9 CFR Part 92 which would prevent cattle which have been exposed to splenetic, southern or tick fever, or have been affected with or exposed to fever ticks, from being imported from Mexico into areas of the State of Texas which are quarantined because of said disease or tick infestation. Only one written comment was received and it was favorable to the proposal as written.

Therefore, after due consideration of all relevant information available to the Department, 9 CFR Part 92 is hereby amended in the following respects:

In § 92.35, the introductory portion of paragraph (a) (2) is amended to read:

§ 92.35 Cattle from Mexico.

(a) * * *

(2) Cattle which have been exposed to splenetic, southern or tick fever or which have been infested with or exposed to fever ticks, may be imported from Mexico into the State of Texas, except into areas quarantined because of said disease or tick infestation as specified in § 72.5 of Subchapter C of this chapter, provided the following conditions are strictly observed and complied with:

* * * * *

(Sec. 6, 26 Stat. 416, as amended, sec. 2, 32 Stat. 792, as amended; secs. 2, 3, 4, and 11, 76 Stat. 129, 130, 132 (21 U.S.C. 104, 111, 134a, 134b, 134c, 134f); 37 FR 28464, 28477; 38 FR 19141.)

Effective date. The foregoing amendment shall become effective January 4, 1974.

The amendment imposes certain restrictions necessary to prevent the spread of piroplasmosis due to fever ticks and must be made effective immediately to accomplish its purpose. It does not appear that further public participation in rulemaking proceedings concerning the amendment would make additional relevant information available to the Department.

Accordingly, under the administrative procedure provisions in 5 U.S.C. 553, it is found upon good cause that further notice and other public procedure with respect to the amendment are impracticable and unnecessary and good cause is found for making it effective less than 30 days after publication in the FEDERAL REGISTER.

Done at Washington, D.C., this 28th day of December 1974.

J. M. HEJL,
Acting Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Service.

[FR Doc.74–335 Filed 1–3–74;8:45 am]

PART 97—OVERTIME SERVICES RELATING TO IMPORTS AND EXPORTS

Commuted Travel Time Allowances

The purpose of this amendment is to establish commuted travel time periods as nearly as may be practicable to cover the time necessarily spent in reporting to and returning from the place at which an employee of Veterinary Services performs overtime or holiday duty when such travel is performed solely on account of overtime or holiday duty. Such establishment depends upon facts within the knowledge of the Animal and Plant Health Inspection Service.

Therefore, pursuant to the authority conferred upon the Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Service by § 97.1 of the regulations concerning overtime services relating to imports and exports (9 CFR 97.1), administrative instructions 9 CFR 97.2 (1973 ed.), as amended January 26, 1973 (38 FR 2442) June 19, 1973 (38 FR 15953), September 5, 1973 (38 FR 23940), and December 7, 1973 (38 FR 33763–33764), prescribing the commuted travel time that shall be included in each period of overtime or holiday duty, are hereby amended by adding to or deleting from the respective lists therein as follows:

OUTSIDE METROPOLITAN AREA

TWO HOURS

Add: Dulles International Airport (when served from College Park, Maryland).

FIVE HOURS

Add: Dulles International Airport (when served from Richmond, Virginia).

FOUR HOURS

Add: San Luis, Arizona (when served from Calexico, California). (64 Stat. 561; 7 U.S.C. 2260.)

Effective date. The foregoing amendment shall become effective January 4, 1974.

It is to the benefit of the public that these instructions be made effective at the earliest practicable date. Accordingly, pursuant to 5 U.S.C. 553, it is found upon good cause that notice and public procedure on these instructions are impracticable, unnecessary, and contrary to the public interest, and good cause is found for making them effective less than 30 days after publication in the FEDERAL REGISTER.

Done at Washington, D.C., this 27th day of December 1973.

J. M. HEJL,
Acting Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Service.

[FR Doc.74–283 Filed 1–3–74;8:45 am]

SUBCHAPTER E—VIRUSES, SERUMS, TOXINS, AND ANALOGOUS PRODUCTS: ORGANISMS AND VECTORS

PART 113—STANDARD REQUIREMENTS

Miscellaneous Amendments

On June 12, 1973, a notice of proposed amendments to Part 113 was published in the FEDERAL REGISTER, Volume 38, Number 112, page 15450.

On October 30, 1973, there was published in the FEDERAL REGISTER, Volume 38, Number 208, page 29885, miscellaneous amendments to the regulations relating to viruses, serums, toxins, and analogous products in Part 113 of Title 9, Code of Federal Regulations, issued pursuant to the provisions of the Virus-Serum-Toxin Act of March 4, 1913 (21 U.S.C. 151–158) which became effective on November 29, 1973.

Amendments were made to § 113.3 to prescribe the number of samples of biological products to be selected by a Veterinary Services representative. It is an accepted practice of long standing in the industry for Sterile Diluent to be supplied to the Department with samples of vaccines that have to be diluted or rehydrated before being put on test. Through inadvertence, no provision requiring samples of Sterile Diluent was

included in § 113.3 in the aforesaid rulemaking proceeding.

All biological establishments licensed under the Virus-Serum-Toxin Act of March 4, 1913, currently produce Sterile Diluent for rehydrating or diluting their vaccines and compliance with this amendment will not necessitate additional time or undue effort or expense on the part of such licensed establishments to comply. It is necessary that the amendment be made effective as soon as practicable in order to function with the other related provisions in Part 113, which became effective November 29, 1973.

Therefore, pursuant to the authority contained in the Virus-Serum-Toxin Act of March 4, 1913 (21 U.S.C. 151–158), § 113.3 is further amended by adding a new § 113.3(b)(9) to read:

§ 113.3 Sampling of biological products.

* * * * *

(b) * * *

(9) *Sterile diluent.* A sample of Sterile Diluent shall accompany each sample of vaccine if such diluent is required to rehydrate or dilute the vaccine before use.

* * * * *

It is hereby found that notice of rulemaking and public procedure thereon are impracticable and unnecessary, and this amendment should be made effective 10 days after publication.

Effective date. This amendment takes effect January 14, 1974.

Done at Washington, D.C., this 28th day of December 1973.

J. M. HEJL,
Acting Deputy Administrator, Veterinary Services, Animal and Plant Health Inspection Service.

[FR Doc.74-337 Filed 1-3-74;8:45 am]

Title 10—Energy

CHAPTER I—ATOMIC ENERGY COMMISSION

PART 20—STANDARDS FOR PROTECTION AGAINST RADIATION

Personnel Monitoring Reports

On June 28, 1973, the Atomic Energy Commission published in the FEDERAL REGISTER (38 FR 17020) proposed amendment to § 20.407, 10 CFR Part 20 of its regulations, that would delete the present requirements for annual reporting by certain licensees of external exposure to named individuals whose total annual exposure exceed applicable quarterly limits, and would require, instead, that these licensees submit an annual statistical summary report on all of the whole body exposures recorded during the preceding year, i.e., the number of individuals whose estimated annual whole body exposure is in each of several specified exposure ranges. The notice indicated that information to be obtained pursuant to the proposed amendment would assist in the evaluation of the risk from radiation exposure in the nuclear industry by permitting a meaningful comparison of current exposure experience among the types of licensees required to report, and among licensees within each type. The information would also assist in the identification of situations to be studied further in order that guidance can be developed on action that should be taken to keep in-plant radiation exposure as low as practicable.

Interested persons were invited to submit written comments and suggestions for consideration in connection with the proposed amendments by August 13, 1973. After consideration of the comments received and other factors involved, the Commission has adopted the proposed amendments, with certain modifications, in the form set forth below.

The rule has been changed to retain the option provided in existing § 20.407(b)(1), of reporting either (i) the total number of individuals for whom personnel monitoring was required during the calendar year, or (ii) the total number of individuals for whom personnel monitoring was provided during the calendar year. The word "annual" has been dropped from § 20.407(b)(2) to make it clear that the number of individuals whose total body exposure was recorded during the previous calendar year, and not just the number of those individuals whose exposure records covered the entire previous year, is to be entered in each of the estimated exposure ranges.

Several comments were addressed to the schedule of whole body exposure ranges. It was noted that a large fraction of monitored individuals may receive an exposure too small to be measured and that an estimate of total manrems based on the median dose in the lowest range proposed (less than 0.1 Rem) would be artifically high. Accordingly a new category has been added to the estimated exposure ranges, "No Measurable Exposure". Wording has been added to the footnote stating that the low exposure range data are required in order to obtain better information about the exposures actually recorded. This amendment does not require improved measurements. Personnel monitoring records should reflect the sensitivity of the monitoring devices being used, and should include the best estimates of the actual exposure incurred.

Other commenters expressed concern that data received pursuant to the proposed amendment would be incomplete and not necessarily representative of actual exposure conditions throughout the industry, and that the proposed amendment should not require licensees to report doses lower than the levels for which personnel monitoring is required to be provided.

The Commission recognizes that neither the existing rule, nor the amendment set forth below, permit evaluation of the overall risk of radiation exposure in the nuclear industry. Not all licensees are required to report, and exposures are not required to be reported for individuals for whom personnel monitoring is not required pursuant to § 20.202(a) or § 34.53(a), even if personnel monitoring were provided as part of good health physics practice. However, for individuals required to be monitored, whether employees or visitors, records of exposures must be maintained pursuant to §20.401(a), and a statistical summary of all the recorded data must be reported by these licensees pursuant to § 20.407, as amended below.

The Commission also recognizes the limitations of monitoring devices and the possible differences between data obtained from routine monitoring programs and the actual doses received by radiation workers. However, the Commission believes that adequate personnel monitoring measurements sufficiently characterize the radiation environment in which the individual works to provide an adequate basis for radiation protection evaluation purposes, and desires to be informed as to the estimated exposures actually being recorded.

The scope of the following amendment is limited. It neither changes requirements regarding the provision of personnel monitoring equipment, or the personnel monitoring information required to be recorded by licensees, nor does it significantly increase the effort required of licensees in preparing required reports.

Other commenters expressed concern that, by changing § 20.407 to require only an annual statistical summary report, there would no longer be a complete radiation exposure data bank. However, while annual reporting of exposures for identified individuals would no longer be required, total exposure of individuals to radiation and radioactive material, incurred during the period of employment or work assignment in the licensee's facility, will continue to be required from the specified categories of licensees pursuant to § 20.408.

One commenter stated that the concept of "as low as practicable" stated in § 20.1(c) did not apply to in-plant radiation exposures, and that a determination that § 20.1(c) applies to other than effluent releases would require a clear demonstration of the need to protect the health and safety of the occupationally exposed worker.

Paragraph 20.1(c) of Part 20 by its terms is not restricted to exposures to members of the public other than occupationally exposed workers. The International Commission on Radiological Protection, the National Council on Radiation Protection and Measurements, and the Federal Radiation Council have recommended that all radiation exposure be maintained as low as practicable. This recommendation applies to all man-made radiation exposures, including in-plant occupational exposures, as well as population exposures resulting from the release of radioactive materials in effluents to unrestricted areas. The recommendation is being implemented by the Commission through the issuance of regulations and guides for applicants and licensees, and through the continuing licensing and inspection programs.

Pursuant to the Atomic Energy Act of 1954, as amended, and sections 552 and 553 of title 5 of the United States Code,

the following amendment to Title 10, Chapter I, Code of Federal Regulations, Part 20, is published as a document subject to codification.

1. Section 20.407 is amended to read as follows:

§ 20.407 Personnel exposure and monitoring reports.

(a) This section applies to each person licensed by the Commission to:

(1) Operate a nuclear reactor designed to produce electrical or heat energy pursuant to § 50.21(b) or § 50.22 of this chapter or a testing facility as defined in § 50.2(r) of this chapter;

(2) Possess or use byproduct material for purposes of radiography pursuant to Parts 30 and 34 of this chapter;

(3) Possess or use at any one time, for purposes of fuel processing fabrication, or reprocessing, special nuclear material in a quantity exceeding 5,000 grams of contained uranium-235, uranium-233, or plutonium or any combination thereof pursuant to Part 70 of this chapter; or

(4) Possess or use at any one time, for processing or manufacturing for distribution pursuant to Part 30, 32, or 33 of this chapter, byproduct material in quantities exceeding anyone of the following quantities:

Radionuclide[1]	*Quantity in curies*
Cesium-137	1
Cobalt-60	1
Gold-198	100
Iodine-131	1
Iridium-192	10
Krypton-85	1,000
Promethium-147	10
Technetium-99m	1,000

(b) Each person described in paragraph (a) of this section shall, within the first quarter of each calendar year, submit to the Director of Regulation, U.S. Atomic Energy Commission, Washington, D.C. 20545, the following reports, applicable to the described licensed activities covering the preceding calendar year: [2]

(1) A report of either (i) the total number of individuals for whom personnel monitoring was required under §§ 20.202(a) or 34.33(a) of this chapter during the calendar year, or (ii) the total number of individuals for whom personnel monitoring was provided during the calendar year; *Provided*, that such total includes at least the number of individuals required to be reported under paragraph (b)(1)(i) of this section. The report shall indicate whether it is submitted in accordance with paragraph (b)(1)(i) or (ii) of this section.

(2) A statistical summary report of the personnel monitoring information recorded by the licensee for individuals for whom personnel monitoring was either required or provided, as described in § 20.407(b)(1), indicating the number of individuals whose total whole body exposure recorded during the previous calendar year was in each of the following estimated exposure ranges:

Estimated Whole Body Exposure Range (Rems)[3]	*Number of individuals in each range*
Estimated whole body exposure range (Rems)[3]	
No measurable exposure	
Measurable exposure less than 0.1	
0.1 to 0.25	
0.25 to 0.5	
0.5 to 0.75	
0.75 to 1	
1 to 2	
2 to 3	
3 to 4	
4 to 5	
5 to 6	
6 to 7	
7 to 8	
8 to 9	
9 to 10	
10 to 11	
11 to 12	
12+	

[3] Individual values exactly equal to the values separating Exposure Ranges shall be reported in the higher range.

The low exposure range data are required in order to obtain better information about the exposures actually recorded. This section does not require improved measurements.

Effective date. This amendment becomes effective February 4, 1974.

(Sec. 161, Pub. L. 83-703, 68 Stat. 948; 42 U.S.C. 2201).

Dated at Germantown, Md. this 26th day of December 1973.

For the Atomic Energy Commission.

PAUL C. BENDER,
Secretary of the Commission.

[FR Doc.74-292 Filed 1-3-74;8:45 am]

[1] The Commission may require, as a license condition, or by rule, regulation or order pursuant to § 20.502, reports from licensees who are licensed to use radionuclides not on this list, in quantities sufficient to cause comparable radiation levels.

[2] The report for calendar year 1973 shall be submitted by May 6, 1974. A licensee whose license expires or terminates prior to, or on the last day of the calendar year, shall submit reports at the expiration or termination of the license, covering that part of the year during which the license was in effect.

[Docket No. RM-50-1]

PART 50—LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

Acceptance Criteria for Emergency Core Cooling Systems for Light Water-Cooled Nuclear Power Reactors

On November 30, 1971, the Atomic Energy Commission published in the FEDERAL REGISTER (36 FR 22774) a notice scheduling a legislative-type public rulemaking hearing on January 27, 1972, before a hearing board consisting of Nathaniel H. Goodrich, Esq., Chairman, Dr. Lawrence R. Quarles, and Dr. John H. Buck, concerning its interim statement of policy establishing acceptance criteria for emergency core cooling systems for light water-cooled nuclear power reactors, published June 29, 1971 (36 FR 12247). Amendments to the interim criteria were published in the FEDERAL REGISTER on December 18, 1971 (36 FR 24082) in a notice that stated that the amendments would also be considered at the rulemaking hearing.

Participation in the rulemaking hearing was extensive. The primary participants included the Commission Regulatory Staff, four reactor manufacturers, a consolidated group of electric utility companies, and the Consolidated National Intervenors (CNI), a group of about 60 organizations and individuals. In addition, three states, the Lloyd Harbor Study Group, and several individuals participated to a lesser degree. The hearings lasted a total of 125 days and generated a record of more than 22,000 pages of transcript and thousands of pages of written direct testimony and exhibits. Oral argument from the seven principal participants was heard by the Commission on October 9, 1973.

In implementation of the National Environmental Policy Act of 1969 (Pub. L. 91-190), a Draft Environmental Statement concerning the proposed rulemaking was forwarded to the Council on Environmental Quality on December 6, 1972, and circulated for comment to participants in the hearing and interested Federal Agencies on December 7, 1972. Notice of public availability of the Statement and an invitation for comment was also published in the FEDERAL REGISTER at that time. Comments on the Draft Statement were received and a Final Environmental Statement was published on May 9, 1973.

The Commission noted in the Interim Policy Statement:

> Protection against a highly unlikely loss-of-collant accident has long been an essential part of the defense-in-depth concept used by the nuclear power industry and the AEC to assure the safety of nuclear power plants. In this concept, the primary assurance of safety is accident prevention by correctly designing, constructing, and operating the reactor. Extensive and systematic quality assurance practices are required and applied at every step to achieve this primary assurance of safety. Nevertheless, deviations from expected behavior are postulated to occur, and protective systems are installed to take corrective action as required in such events. Notwithstanding all this, the occurrence of serious accidents is postulated, in spite of the fact that they are highly unlikely, and engineered safety features are installed to mitigate the consequences of these unlikely events. The loss-of-coolant accident is such a postulated improbable accident; the emergency core cooling system is one of the engineered safety features installed to mitigate its consequences.

The Commission has adopted new regulations, set forth below, dealing with the effectiveness of ECCS. In a 140 page opinion issued on December 28, 1973, the Commission discussed the changes from the interim acceptance criteria and the technical reason for them. Copies of this opinion are available for inspection and copying at the Commission's Public Document Room, 1717 H Street, NW., Washington, D.C.

The principal changes from the Interim Policy Statement are as follows. The old criterion number one, specifying that the

temperature of the zircaloy cladding should not exceed 2300°F, is replaced by two criteria, lowering the allowed peak zircaloy temperature to 2200°F and providing a limit on the maximum allowed local oxidation. The other three criteria of the IAC are retained, with some modification of the wording. These three criteria limit the hydrogen generation from metal-water reactions, require maintenance of a coolable core geometry, and provide for long-term cooling of the quenched core.

The most important effect of the changes in the required features of the evaluation models is that swelling and bursting of the cladding must now be taken into consideration when they are calculated to occur, and that the maximum temperature and oxidation criteria must be applied to the region of clad swelling or bursting when the maximum temperature and oxidation are calculated to occur there. Another important change is the requirement that, in the steady state operation just before the postulated accident, the thermal conductance of the gap between the fuel pellets and the cladding should be calculated taking into consideration any increase in gap dimensions resulting from such phenomena as fuel densification, and should also consider the effects of the presence of fission gases. When these effects are taken into consideration a higher stored energy may be calculated. Other changes in the evaluation models are mostly in the direction of replacing previous broad conservative assumptions with more detailed calculations where new experimental information is available or where better calculational methods have been developed.

The wording of the definition of a loss-of-coolant accident has been modified to conform to its long-accepted usage, limiting it to breaks in pipes. The new regulations also require a more complete documentation of the evaluation models that are used.

The Commission believes that the implementation of the new regulations will ensure an adequate margin of performance of the ECCS should a design basis LOCA ever occur. This margin is provided by conservative features of the evaluation models and by the criteria themselves. Some of the major points that contribute to the conservative nature of the evaluations and the criteria are as follows:

(1) *Stored heat.* The assumption of 102 percent of maximum power, highest allowed peaking factor, and highest estimated thermal resistance between the UO_2 and the cladding provides a calculated stored heat that is possible but unlikely to occur at the time of a hypothetical accident. While not necessarily a margin over the extreme condition, it represents at least an assumption that an accident happens at a time which is not typical.

(2) *Blow-down.* The calculation of the heat transfer during blowdown is made in a very conservative manner. There is evidence that more of the stored heat would be removed than calculated, although there is not yet an accepted way of calculating the heat transfer more accurately. It is probable that this represents a conservatism of several hundred degrees F. in stored energy after blowdown, most of which can reasonably be expected to carry over to a reduction in the calculated peak temperature of the zircaloy cladding.

(3) *Rate of heat generation.* It is assumed that the heat generation rate from the decay of fission products is 20 percent greater than the proposed ANS standard. This represents an upper limit to the degree of uncertainty. The assumption that the fission product level is that resulting from operation at 102 percent of rated power for an infinite time represents an improbable situation, with a conservatism that is probably in the range of 5 to 15 percent. The use of the Baker-Just equation for calculating the heat generation from the steam oxidation of zircaloy should also provide some conservatism, but the factor is uncertain.

(4) *The peak temperature criterion.* The limitation of the peak calculated temperature of the cladding to 2200° F and the stipulation that this criterion be applied to the hottest region of the hottest fuel rod provide a substantial degree of conservatism. They ensure that the core would suffer very little damage in the accident.

Pursuant to the Atomic Energy Act of 1954, as amended, and sections 552 and 553 of title 5 of the United States Code, the following amendments to Title 10, Chapter I, Code of Federal Regulations, Part 50, are published as a document subject to codification to be effective on February 4, 1974.

1. A new sentence is added to § 50.34 (a)(4) of 10 CFR Part 50 to read as follows:

§ 50.34 Contents of applications: Technical information.

(a) * * *

(4) * * * Analysis and evaluation of ECCS cooling performance following postulated loss-of-coolant accidents shall be performed in accordance with the requirements of § 50.46 for facilities for which construction permits may be issued after December 28, 1974.

* * * * *

2. A new sentence is added to § 50.34 (b)(4) 10 CFR Part 50 to read as follows:

§ 50.34 Contents of applications; technical information.

* * * * *

(b) * * *

(4) * * * Analysis and evaluation of ECCS cooling performance following postulated loss-of-coolant accidents shall be performed in accordance with the requirements of § 50.46 for facilities for which a license to operate may be issued after December 28, 1974.

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3. A new § 50.46 is added to 10 CFR Part 50 to read as follows:

§ 50.46 Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors.

(a)(1) Except as provided in paragraph (a)(2) and (3) of this section, each boiling and pressurized light-water nuclear power reactor fueled with uranium oxide pellets within cylindrical Zircaloy cladding shall be provided with an emergency core cooling system (ECCS) which shall be designed such that its calculated cooling performance following postulated loss-of-coolant accidents conforms to the criteria set forth in paragraph (b) of this section. ECCS cooling performance shall be calculated in accordance with an acceptable evaluation model, and shall be calculated for a number of postulated loss-of-coolant accidents of different sizes, locations, and other properties sufficient to provide assurance that the entire spectrum of postulated loss-of-coolant accidents is covered. Appendix K, ECCS Evaluation Models, sets forth certain required and acceptable features of evaluation models. Conformance with the criteria set forth in paragraph (b) of this section with ECCS cooling performance calculated in accordance with an acceptable evaluation model, may require that restrictions be imposed on reactor operation.

(2) With respect to reactors for which operating licenses have previously been issued and for which operating licenses may ssue on or before December 28, 1974:

(i) The time within which actions required or permitted under this subparagraph (2) must occur shall begin to run on 30 days after publication of the rule in the FEDERAL REGISTER.

(ii) Within six months following the date specified in paragraph (a)(2)(i) of this section an evaluation in accordance with paragraph (a)(1) of this section shall be submitted to the Director of Regulation. The evaluation shall be accompanied by such proposed changes in technical specifications or license amendments as may be necessary to bring reactor operation in conformity with paragraph (a)(1) of this section.

(iii) Any licensee may request an extension of the six-month period referred to in paragraph (a)(2)(ii) of this section for good cause. Any such request shall be submitted not less than 45 days prior to expiration of the six-month period, and shall be accompanied by affidavits showing precisely why the evaluation is not complete and the minimum time believed necessary to complete it. The Director of Regulation shall cause notice of such a request to be published promptly in the FEDERAL REGISTER; such notice shall provide for the submission of comments by interested persons within a time period to be established by the Director of Regulation. If, upon reviewing the foregoing submissions, the Director of Regulation concludes that good cause has been shown for an extension, he may extend the six-month period for the shortest additional time which in this judgment will be necessary to enable the licensee to furnish the submissions required by paragraph (a)(2)(ii) of this section. Re-

quests for extensions of the six-month period, submitted under this subparagraph, shall be ruled upon by the Director of Regulation prior to expiration of that period.

(iv) Upon submission of the evaluation required by subparagraph (ii) of this subparagraph (2) (or under subparagraph (iii), if the six-month period is extended) the facility shall continue or commence operation only within the limits of both the proposed technical specifications or license amendments submitted in accordance with this subparagraph (2) and all technical specifications or license conditions previously imposed by the Commission, including the requirements of the Interim Policy Statement (June 29, 1971, 36 FR 12248), as amended (December 18, 1971, 36 FR 24082).

(v) Further restrictions on reactor operation will be imposed by the Director of Regulation if he finds that the evaluations submitted under subparagraphs (ii) and (iii) of this subparagraph (2) are not consistent with subparagraph (1) of this paragraph (a) and as a result such restrictions are required to protect the public health and safety.

(vi) Exemptions from the operating requirements of subparagraph (iv) of this subparagraph (2) may be granted by the Commission for good cause. Requests for such exemption shall be submitted not less than 45 days prior to the date upon which the plant would otherwise be required to operate in accordance with the procedures of said subparagraph (iv). Any such request shall be filed with the Secretary of the Commission, who shall cause notice of its receipt to be published promptly in the FEDERAL REGISTER; such notice shall provide for the submission of comments by interested persons within 14 days following FEDERAL REGISTER publication. The Director of Regulation shall submit his views as to any requested exemption within five days following expiration of the comment period.

(vii) Any request for an exemption submitted under subparagraph (vi) of this subparagraph (2) must show, with appropriate affidavits and technical submissions, that it would be in the public interest to allow the licensee a specified additional period of time within which to alter the operation of the facility in the manner required by subparagraph (iv) of this subparagraph (2). The request shall also include a discussion of the alternatives available for establishing compliance with the rule.

(3) Construction permits may be issued after December 28, 1973 but before December 28, 1974 subject to any applicable conditions or restrictions imposed pursuant to other regulations in this chapter and the Interim Acceptance Criteria for Emergency Core Cooling Systems published on June 29, 1971 (36 F.R. 12248) as amended (December 18, 1971, 36 F.R. 24082): *Provided, however*, that no operating license shall be issued for facilities constructed in accordance with construction permits issued pursuant to this subparagraph, unless the Commission determines, among other things, that the proposed facility meets the requirements of subparagraph (1) of this paragraph.

(b)(1) *Peak cladding temperature.* The calculated maximum fuel element cladding temperature shall not exceed 2200° F.

(2) *Maximum cladding oxidation.* The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation. As used in this subparagraph total oxidation means the total thickness of cladding metal that would be locally converted to oxide if all the oxygen absorbed by and reacted with the cladding locally were converted to stoichiometric zirconium dioxide. If cladding rupture is calculated to occur, the inside surfaces of the cladding shall be included in the oxidation, beginning at the calculated time of rupture. Cladding thickness before oxidation means the radial distance from inside to outside the cladding, after any calculated rupture or swelling has occurred but before significant oxidation. Where the calculated conditions of transient pressure and temperature lead to a prediction of cladding swelling, with or without cladding rupture, the unoxidized cladding thickness shall be defined as the cladding cross-sectional area, taken at a horizontal plane at the elevation of the rupture, if it occurs, or at the elevation of the highest cladding temperature if no rupture is calculated to occur, divided by the average circumference at that elevation. For ruptured cladding the circumference does not include the rupture opening.

(3) *Maximum hydrogen generation.* The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.

(4) *Coolable geometry.* Calculated changes in core geometry shall be such that the core remains amenable to cooling.

(5) *Long-term cooling.* After any calculated successful initial operation of the ECCS, the calculated core temperature shall be maintained at an acceptably low value and decay heat shall be removed for the extended period of time required by the long-lived radioactivity remaining in the core.

(c) As used in this section:

(1) Loss-of-coolant accidents (LOCA's) are hypothetical accidents that would result from the loss of reactor coolant, at a rate in excess of the capability of the reactor coolant makeup system, from breaks in pipes in the reactor coolant pressure boundary up to and including a break equivalent in size to the double-ended rupture of the largest pipe in the reactor coolant system.

(2) An evaluation model is the calculational framework for evaluating the behavior of the reactor system during a postulated loss-of-coolant accident (LOCA). It includes one or more computer programs and all other information necessary for application of the calculational framework to a specific LOCA, such as mathematical models used, assumptions included in the programs, procedure for treating the program input and output information, specification of those portions of analysis not included in computer programs, values of parameters, and all other information necessary to specify the calculational procedure.

(d) The requirements of this section are in addition to any other requirements applicable to ECCS set forth in this Part. The criteria set forth in paragraph (b), with cooling performance calculated in accordance with an acceptable evaluation model, are in implementation of the general requirements with respect to ECCS cooling performance design set forth in this Part, including in particular Criterion 35 of Appendix A.

4. A new Appendix K is added to 10 CFR Part 50 to read as follows:

APPENDIX K—ECCS EVALUATION MODELS

I. Required and Acceptable Features of Evaluation Models.

II. Required Documentation.

I. REQUIRED AND ACCEPTABLE FEATURES OF THE EVALUATION MODELS

A. *Sources of heat during the LOCA.* For the heat sources listed in paragraphs 1 to 4 below it shall be assumed that the reactor has been operating continuously at a power level at least 1.02 times the licensed power level (to allow for such uncertainties as instrumentation error), with the maximum peaking factor allowed by the technical specifications. A range of power distribution shapes and peaking factors representing power distributions that may occur over the core lifetime shall be studied and the one selected should be that which results in the most severe calculated consequences, for the spectrum of postulated breaks and single failures analyzed.

1. *The Initial Stored Energy in the Fuel.* The steady-state temperature distribution and stored energy in the fuel before the hypothetical accident shall be calculated for the burn-up that yields the highest calculated cladding temperature (or, optionally, the highest calculated stored energy.) To accomplish this, the thermal conductivity of the UO_2 shall be evaluated as a function of burn-up and temperature, taking into consideration differences in initial density, and the thermal conductance of the gap between the UO_2 and the cladding shall be evaluated as a function of the burn-up, taking into consideration fuel densification and expansion, the composition and pressure of the gases within the fuel rod, the initial cold gap dimension with its tolerances, and cladding creep.

2. *Fission Heat.* Fission heat shall be calculated using reactivity and reactor kinetics. Shutdown reactivities resulting from temperatures and voids shall be given their minimum plausible values, including allowance for uncertainties, for the range of power distribution shapes and peaking factors indicated to be studied above. Rod trip and insertion may be assumed if they are calculated to occur.

3. *Decay of Actinides.* The heat from the radioactive decay of actinides, including neptunium and plutonium generated during operation, as well as isotopes of uranium, shall be calculated in accordance with fuel cycle calculations and known radioactive properties. The actinide decay heat chosen

shall be that appropriate for the time in the fuel cycle that yields the highest calculated fuel temperature during the LOCA.

4. *Fission Product Decay.* The heat generation rates from radioactive decay of fission products shall be assumed to be equal to 1.2 times the values for infinite operating time in the ANS Standard (Proposed American Nuclear Society Standards—"Decay Energy Release Rates Following Shutdown of Uranium-Fueled Thermal Reactors". Approved by Subcommittee ANS-5, ANS Standards Committee, October 1971). The fraction of the locally generated gamma energy that is deposited in the fuel (including the cladding) may be different from 1.0; the value used shall be justified by a suitable calculation.

5. *Metal-Water Reaction Rate.* The rate of energy release, hydrogen generation, and cladding oxidation from the metal/water reaction shall be calculated using the Baker-Just equation (Baker, L., Just, L.C., "Studies of Metal Water Reactions at High Temperatures, III. Experimental and Theoretical Studies of the Zirconium-Water Reaction," ANL–6548, page 7, May 1962). The reaction shall be assumed not to be steam limited. For rods whose cladding is calculated to rupture during the LOCA, the inside of the cladding shall also be assumed to react after the rupture. The calculation of the reaction rate on the inside of the cladding shall also follow the Baker-Just equation, starting at the time when the cladding is calculated to rupture, and extending around the cladding inner circumference and axially no less than 1.5 inches each way from the location of the rupture, with the reaction assumed not to be steam limited.

6. *Reactor Internals Heat Transfer.* Heat transfer from piping, vessel walls, and nonfuel internal hardware shall be taken into account.

7. *Pressurized Water Reactor Primary-to-Secondary Heat Transfer.* Heat transferred between primary and secondary systems through heat exchangers (steam generators) shall be taken into account. (Not applicable to Boiling Water Reactors.)

B. SWELLING AND RUPTURE OF THE CLADDING AND FUEL ROD THERMAL PARAMETERS

Each evaluation model shall include a provision for predicting cladding swelling and rupture from consideration of the axial temperature distribution of the cladding and from the difference in pressure between the inside and outside of the cladding, both as functions of time. To be acceptable the swelling and rupture calculations shall be based on applicable data in such a way that the degree of swelling and incidence of rupture are not underestimated. The degree of swelling and rupture shall be taken into account in calculations of gap conductance, cladding oxidation and embrittlement, and hydrogen generation.

The calculations of fuel and cladding temperatures as a function of time shall use values for gap conductance and other thermal parameters as functions of temperature and other applicable time-dependent variables. The gap conductance shall be varied in accordance with changes in gap dimensions and any other applicable variables.

C. BLOWDOWN PHENOMENA

1. *Break Characteristics and Flow.* a. In analyses of hypothetical loss-of-coolant accidents, a spectrum of possible pipe breaks shall be considered. This spectrum shall include instantaneous double-ended breaks ranging in cross-sectional area up to and including that of the largest pipe in the primary coolant system. The analysis shall also include the effects of longitudinal splits in the largest pipes, with the split area equal to the cross-sectional area of the pipe.

b. *Discharge Model.* For all times after the discharging fluid has been calculated to be two-phase in composition, the discharge rate shall be calculated by use of the Moody model (F. J. Moody, "Maximum Flow Rate of a Single Component, Two-Phase Mixture," *Journal of Heat Transfer, Trans American Society of Mechanical Engineers*, 87, No. 1, February, 1965). The calculation shall be conducted with at least three values of a discharge coefficient applied to the postulated break area, these values spanning the range from 0.6 to 1.0. If the results indicate that the maximum clad temperature for the hypothetical accident is to be found at an even lower value of the discharge coefficient, the range of discharge coefficients shall be extended until the maximum clad temperature calculated by this variation has been achieved.

c. *End of Blowdown.* (Applies Only to Pressurized Water Reactors.) For postulated cold leg breaks, all emergency cooling water injected into the inlet lines or the reactor vessel during the bypass period shall in the calculations be subtracted from the reactor vessel calculated inventory. This may be executed in the calculation during the bypass period, or as an alternative the amount of emergency core cooling water calculated to be injected during the bypass period may be subtracted later in the calculation from the water remaining in the inlet lines, downcomer, and reactor vessel lower plenum after the bypass period. This bypassing shall end in the calculation at a time designated as the "end of bypass," after which the expulsion or entrainment mechanisms responsible for the bypassing are calculated not to be effective. The end-of-bypass definition used in the calculation shall be justified by a suitable combination of analysis and experimental data. Acceptable methods for defining "end of bypass" include, but are not limited to, the following: (1) Prediction of the blowdown calculation of downward flow in the downcomer for the remainder of the blowdown period; (2) Prediction of a threshold for droplet entrainment in the upward velocity, using local fluid conditions and a conservative critical Weber number.

d. *Noding Near the Break and the ECCS Injection Points.* The noding in the vicinity of and including the broken or split sections of pipe and the points of ECCS injection shall be chosen to permit a reliable analysis of the thermodynamic history in these regions during blowdown.

2. *Frictional Pressure Drops.* The frictional losses in pipes and other components including the reactor core shall be calculated using models that include realistic variation of friction factor with Reynolds number, and realistic two-phase friction multipliers that have been adequately verified by comparison with experimental data, or models that prove at least equally conservative with respect to maximum clad temperature calculated during the hypothetical accident. The modified Baroczy correlation (Baroczy, C. J., "A Systematic Correlation for Two-Phase Pressure Drop," *Chem. Enging. Prog. Symp. Series*, No. 64, Vol. 62, 1965) or a combination of the Thom correlation (Thom, J.R.S., "Prediction of Pressure Drop During Forced Circulation Boiling of Water," *Int. J. of Heat & Mass Transfer*, 7, 709–724, 1964) for pressures equal to or greater than 250 psia and the Martinelli-Nelson correlation (Martinelli, R. C. Nelson, D.B., "Prediction of Pressure Drop During Forced Circulation Boiling of Water," *Transactions of ASME*, 695–702, 1948) for pressures lower than 250 psia is acceptable as a basis for calculating realistic two-phase friction multipliers.

3. *Momentum Equation.* The following effects shall be taken into account in the conservation of momentum equation: (1) temporal change of momentum, (2) momentum convection, (3) area change momentum flux, (4) momentum change due to compressibility, (5) pressure loss resulting from wall friction, (6) pressure loss resulting from area change, and (7) gravitational acceleration. Any omission of one or more of these terms under stated circumstances shall be justified by comparative analyses or by experimental data.

4. *Critical Heat Flux.* a. Correlations developed from appropriate steady-state and transient-state experimental data are acceptable for use in predicting the critical heat flux (CHF) during LOCA transients. The computer programs in which these correlations are used shall contain suitable checks to assure that the physical parameters are within the range of parameters specified for use of the correlations by their respective authors.

b. Steady-state CHF correlations acceptable for use in LOCA transients include, but are not limited to, the following:

(1) *W 3.* L. S. Tong, "Prediction of Departure from Nucleate Boiling for an Axially Non-uniform Heat Flux Distribution," *Journal of Nuclear Energy*, Vol. 21, 241–248, 1967.

(2) *B&W–2.* J. S. Gellerstedt, R. A. Lee, W. J. Oberjohn, R. H. Wilson, L. J. Stanek, "Correlation of Critical Heat Flux in a Bundle Cooled by Pressurized Water," *Two-Phase Flow and Heat Transfer in Rod Bundles*, ASME, New York, 1969.

(3) *Hench-Levy.* J. M. Healzer, J. E. Hench, E. Janssen, S. Levy "Design Basis for Critical Heat Flux Condition in Boiling Water Reactors," APED–5186, GE Company Private report, July 1966.

(4) *Macbeth. R. V.* Macbeth, "An Appraisal of Forced Convection Burnout Data," *Proceedings of the Institute of Mechanical Engineers*, 1965–1966.

(5) *Barnett.* P. G. Barnett, "A Correlation of Burnout Data for Uniformly Heated Annuli and Its Uses for Predicting Burnout in Uniformly Heated Rod Bundles," AEEW-R 463, 1966.

(6) *Hughes.* E. D. Hughes, "A Correlation of Rod Bundle Critical Heat Flux for Water in the Pressure Range 150 to 725 psia," IN-1412, Idaho Nuclear Corporation, July 1970.

c. Correlations of appropriate transient CHF data may be accepted for use in LOCA transient analyses if comparisons between the data and the correlations are provided to demonstrate that the correlations predict values of CHF which allow for uncertainty in the experimental data throughout the range of parameters for which the correlations are to be used. Where appropriate, the comparisons shall use statistical uncertainty analysis of the data to demonstrate the conservatism of the transient correlation.

d. Transient CHF correlations acceptable for use in LOCA transients include, but are not limited to, the following:

(1) *GE transient CHF.* B. C. Slifer, J. E. Hench, "Loss-of-Coolant Accident and Emergency Core Cooling Models for General Electric Boiling Water Reactors," NEDO–10329, General Electric Company, Equation C–32, April 1971.

e. After CHF is first predicted at an axial fuel rod location during blowdown, the calculation shall not use nucleate boiling heat transfer correlations at that location subsequently during the blowdown even if the calculated local fluid and surface conditions would apparently justify the reestablishment of nucleate boiling. Heat transfer assumptions characteristic of return to nucleate boiling (rewetting) shall be permitted when justified by the calculated local fluid and surface conditions during the reflood portion of a LOCA.

5. *Post-CHF Heat Transfer Correlations.* a. Correlations of heat transfer from the fuel cladding to the surrounding fluid in the post-CHF regimes of transition and film boiling shall be compared to applicable steady-state and transient-state data using statistical correlation and uncertainty analyses. Such comparison shall demonstrate that the correlations predict values of heat transfer coefficient equal to or less than the mean value of the applicable experimental heat transfer data throughout the range of parameters for which the correlations are to be used. The comparisons shall quantify the relation of the correlations to the statistical uncertainty of the applicable data.

b. The Groeneveld flow film boiling correlation (equation 5.7 of D.C. Groeneveld, "An Investigation of Heat Transfer in the Liquid Deficient Regime," AECL–3281, revised December 1969), the Dougall-Rohsenow flow film boiling correlation (R. S. Dougall and W. M. Rohsenow, "Film Boiling on the Inside of Vertical Tubes with Upward Flow of the Fluid at Low Qualities,: MIT Report Number 9079–26, Cambridge, Massachusetts, September 1963), and the Westinghouse correlation of steady-state transition boiling ("Proprietary Redirect/Rebuttal Testimony of Westinghouse Electric Corporation," U.S.A.E.C. Docket RM–50–1, page 25–1, October 26, 1972) are acceptable for use in the poast-CHF boiling regimes. In addition the transition boiling correlation of McDonough, Milich, and King (J. B. McDonough, W. Milich, E. C. King, "Partial Film Boiling with Water at 2000 psig in a Round Vertical Tube," MSA Research Corp., Technical Report 62 (NP–6976), (1958) is suitable for use between nucelate and film boiling. Use of all these correlations shall be restricted as follows:

(1) The Groeneveld correlation shall not be used in the region near its low-pressure singularity,

(2) the first term (nucleate) of the Westinghouse correlation and the entire McDonough, Milich, and King correlation shall not be used during the blowdown after the temperature difference between the clad and the saturated fluid first exceeds 300° F,

(3) transition boiling heat transfer shall not be reapplied for the remainder of the LOCA blowdown, even if the clad superheat returns below 300° F, except for the reflood portion of the LOCA when justified by the calculated local fluid and surface conditions.

6. *Pump Modeling.* The characteristics of rotating primary system pumps (axial flow, turbine, or centrifugal) shall be derived from a dynamic model that includes momentum transfer between the fluid and the rotating member, with variable pump speed as a function of time. The pump model resistance used for analysis should be justified. The pump model for the two-phase region shall be verified by applicable two-phase pump performance data. For BWR's after saturation is calculated at the pump suction, the pump head may be assumed to vary linearly with quality, going to zero for one percent quality at the pump suction, so long as the analysis shows that core flow stops before the quality at pump suction reaches one percent.

7. *Core Flow Distribution During Blowdown.* (Applies only to pressurized water reactors.)

a. The flow rate through the hot region of the core during blowdown shall be calculated as a function of time. For the purpose of these calculations the hot region chosen shall not be greater than the size of one fuel assembly. Calculations of average flow and flow in the hot region shall take ino account cross flow between regions and any flow blockage calculated to occur during blowdown as a result of cladding swelling or rupture. The calculated flow shall be smoothed to eliminate any calculated rapid oscillations (period less than 0.1 seconds).

b. A method shall be specified for determining the enthalpy to be used as input data to the hot channel heatup analysis from quantities calculated in the blowdown analysis, consistent with the flow distribution calculations.

D. POST-BLOWDOWN PHENOMENA; HEAT REMOVAL BY THE ECCS

1. *Single Failure Criterion.* An analysis of possible failure modes of ECCS equipment and of their effects on ECCS performance must be made. In carrying out the accident evaluation the combination of ECCS subsystems assumed to be operative shall be those available after the most damaging single failure of ECCS equipment has taken place.

2. *Containment Pressure.* The containment pressure used for evaluating cooling effectiveness during reflood and spray cooling shall not exceed a pressure calculated conservatively for this purpose. The calculation shall include the effects of operation of all installed pressure-reducing systems and processes.

3. *Calculation of Reflood Rate for Pressurized Water Reactors.* The refilling of the reactor vessel and the time and rate of reflooding of the core shall be calculated by an acceptable model that takes into consideration the thermal and hydraulic characteristics of the core and of the reactor system. The primary system coolant pumps shall be assumed to have locked impellers if this assumption leads to the maximum calculated cladding temperature; otherwise the pump rotor shall be assumed to be running free. The ratio of the total fluid flow at the core exit plane to the total liquid flow at the core inlet plane (carryover fraction) shall be used to determine the core exit flow and shall be determined in accordance with applicable experimental data (for example, "PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Final Report," Westinghouse Report WCAP–7665, April 1971; "PWR Full Length Emergency Cooling Heat Transfer (FLECHT) Group I Test Report," Westinghouse Report WCAP–7435, January 1970; "PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Group II Test Report," Westinghouse Report WCAP–7544, September 1970; "PWR FLECHT Final Report Supplement," Westinghouse Report WCAP–7931, October 1972).

The effects on reflooding rate of the compressed gas in the accumulator which is discharged following accumulator water discharge shall also be taken into account.

4. *Steam Interaction with Emergency Core Cooling Water in Pressurized Water Reactors.* The thermal-hydraulic interaction between steam and all emergency core cooling water shall be taken into account in calculating the core reflooding rate. During refill and reflood, the calculated steam flow in unbroken reactor coolant pipes shall be taken to be zero during the time that accumulators are discharging water into those pipes unless experimental evidence is available regarding the realistic thermal-hydraulic interaction between the steam and the liquid. In this case, the experimental data may be used to support an alternate assumption.

5. *Refill and Reflood Heat Transfer for Pressurized Water Reactors.* For reflood rates of one inch per second or higher, reflood heat transfer coefficients shall be based on applicable experimental data for unblocked cores including FLECHT results ("PWR FLECHT (Full Length Emergency Cooling Heat Transfer) Final Report," Westinghouse Report WCAP–7665, April 1971). The use of a correlation derived from FLECHT data shall be demonstrated to be conservative for the transient to which it is applied; presently available FLECHT heat transfer correlations ("PWR Full Length Emergency Cooling Heat Transfer (FLECHT) Group I Test Report," Westinghouse Report WCAP–7544, September 1970; "PWR FLECHT Final Report Supplement," Westinghouse Report WCAP–7931, October 1972) are not acceptable. New correlations or modifications to the FLECHT heat transfer correlations are acceptable only after they are demonstrated to be conservative, by comparison with FLECHT data, for a range of parameters consistent with the transient to which they are applied.

During refill and during reflood when reflood rates are less than one inch per second, heat transfer calculations shall be based on the assumption that cooling is only by steam, and shall take into account any flow blockage calculated to occur as a result of cladding swelling or rupture as such blockage might affect both local steam flow and heat transfer.

6. *Convective Heat Transfer Coefficients for Boiling Water Reactor Fuel Rods Under Spray Cooling.* Following the blowdown period, convective heat transfer shall be calculated using coefficients based on appropriate experimental data. For reactors with jet pumps and having fuel rods in a 7 x 7 fuel assembly array, the following convective coefficients are acceptable:

a. During the period following lower plenum flashing but prior to the core spray reaching rated flow, a convective heat transfer coefficient of zero shall be applied to all fuel rods.

b. During the period after core spray reaches rated flow but prior to reflooding, convective heat transfer coefficients of 3.0, 3.5, 1.5, and 1.5 Btu-hr^{-1}-ft^{-2}°F^{-1} shall be applied to the fuel rods in the outer corners, outer row, next to outer row, and to those remaining in the interior, respectively, of the assembly.

c. After the two-phase reflooding fluid reaches the level under consideration, a convective heat transfer coefficient of 25 Btu-hr^{-1}-ft^{-2}°F^{-1} shall be applied to all fuel rods.

7. *The Boiling Water Reactor Channel Box Under Spray Cooling.* Following the blowdown period, heat transfer from, and wetting of, the channel box shall be based on appropriate experimental data. For reactors with jet pumps and fuel rods in a 7x7 fuel assembly array, the following heat transfer coefficients and wetting time correlation are acceptable.

a. During the period after lower plenum flashing, but prior to core spray reaching rated flow, a convective coefficient of zero shall be applied to the fuel assembly channel box.

b. During the period after core spray reaches rated flow, but prior to wetting of the channel, a convective heat transfer coefficient of 5 Btu-hr^{-1}-ft^{-2}-°F^{-1} shall be applied to both sides of the channel box.

c. Wetting of the channel box shall be assumed to occur 60 seconds after the time determined using the correlation based on the Yamanouchi analysis ("Loss-of-Coolant Accident and Emergency Core Cooling Models for General Electric Boiling Water Reactors," General Electric Company Report NEDO–10329, April 1971).

II. REQUIRED DOCUMENTATION

1. a. A description of each evaluation model shall be furnished. The description shall be sufficiently complete to permit technical review of the analytical approach including the equations used, their approximations in difference form, the assumptions made, and the values of all parameters or the procedure for their selection, as for example, in accordance with a specified physical law or empirical correlation.

b. The description shall be sufficiently detailed and specific to require significant changes in the evaluation model to be specified in amendments of the description. For

this purpose, a significant change is a change that would result in a calculated fuel cladding temperature different by more than 20°F from the temperature calculated (as a function of time) for a postulated LOCA using the last previously accepted model.

c. A complete listing of each computer program, in the same form as used in the evaluation model, shall be furnished to the Atomic Energy Commission.

2. For each computer program, solution convergence shall be demonstrated by studies of system modeling or noding and calculational time steps.

3. Appropriate sensitivity studies shall be performed for each evaluation model, to evaluate the effect on the calculated results of variations in noding, phenomena assumed in the calculation to predominate, including pump operation or locking, and values of parameters over their applicable ranges. For items to which results are shown to be sensitive, the choices made shall be justified.

4. To the extent practicable, predictions of the evaluation model, or portions thereof, shall be compared with applicable experimental information.

5. General Standards for Acceptability—Elements of evaluation models reviewed will include technical adequacy of the calculational methods, including compliance with required features of Section I of this Appendix K and provision of a level of safety and margin of conservatism comparable to other acceptable evaluation models, taking into account significant differences in the reactors to which they apply.

(Sec. 161, Pub. Law 83-703, 68 Stat. 948, 80 Stat. 383, 81 Stat. 54; 22 U.S.C. 2201, 5 U.S.C. 552, 553.)

Dated at Washington, D.C. this 28th day of December 1973.

For the Atomic Energy Commission.

PAUL C. BENDER,
Secretary of the Commission.

[FR Doc.74-287 Filed 1-3-74;8:45 am]

Title 12—Banks and Banking

CHAPTER II—FEDERAL RESERVE SYSTEM

SUBCHAPTER A—BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

[Regs. G, T, U]

MAXIMUM LOAN VALUE OF STOCKS

Parts 207, 220 and 221 (Regulations G, T and U) are amended to change from 35 percent to 50 percent the maximum loan value of margin securities. This will have the effect of decreasing the amount of margin required for stock-secured loans and short sales.

PART 207—SECURITIES CREDIT BY PERSONS OTHER THAN BANKS, BROKERS OR DEALERS

1. Effective January 3, 1974, § 207.5(a) (the Supplement to Regulation G) is amended to read as follows:

§ 207.5 Supplement.

(a *Maximum loan value of margin securities.* For the purpose of § 207.1, the maximum loan value of any margin security, except convertible securities subject to § 207.1(d), shall be 50 percent of its current market value, as determined by any reasonable method.

* * * * *

PART 220—CREDIT BY BROKERS AND DEALERS

2. Effective January 3, 1974, § 220.8 (a) (1) and (d) (the Supplement to Regulation T) is amended to read as follows:

§ 220.8 Supplement.

(a) *Maximum loan value for general accounts.* The maximum loan value of securities in a general account subject to § 220.3 shall be:

(1) Of a registered nonequity security held in the account on March 11, 1968, and continuously thereafter, and of a margin equity security (except as provided in § 220.3(c) and paragraphs (b) and (c) of this section) 50 per cent of the current market value of such securities.

* * * * *

(d) *Margin required for short sales.* The amount to be included in the adjusted debit balance of a general account, pursuant to § 220.3(d)(3), as margin required for short sales of securities (other than exempted securities) shall be 50 per cent of the current market value of each security.

* * * * *

PART 221—CREDIT BY BANKS FOR THE PURPOSE OF PURCHASING OR CARRYING MARGIN STOCKS

3. Effective January 3, 1974, § 221.4(a) (the Supplement to Regulation U) is amended to read as follows:

§ 221.4 Supplement.

(a) *Maximum loan value of stocks.* For the purposes of § 221.1, the maximum loan value of any stock, whether or not registered on a national securities exchange, shall be 50 percent of its current market value, as determined by any reasonable method.

* * * * *

4a. These amendments are issued pursuant to section 7 of the Securities Exchange Act of 1934 (15 U.S.C. 78g).

b. The requirements of 5 U.S.C. section 553 with respect to notice and public participation were not followed in connection with these amendments because following such requirements would be impracticable due to the highly technical nature of the subject matter involved and because it would be contrary to the public interest if this action were not immediately effective. The requirements of 5 U.S.C. section 553 with respect to deferred effective dates were not followed in connection with these amendments because these amendments relieve restrictions previously imposed.

By order of the Board of Governors, January 2, 1974.

[SEAL] CHESTER B. FELDBERG,
Secretary of the Board.

[FR Doc.74-531 Filed 1-2-74;5:04 pm]

CHAPTER V—FEDERAL HOME LOAN BANK BOARD

SUBCHAPTER E—DISTRICT OF COLUMBIA SAVINGS AND LOAN ASSOCIATIONS AND BRANCH OFFICES

[No. 73-2034]

PART 582—OFFICES

Satellite Offices of District of Columbia Savings and Loan Associations

DECEMBER 21, 1973.

The Federal Home Loan Bank Board considers it advisable to amend § 582.1-1 of the Regulations for District of Columbia Savings and Loan Associations and Branch Offices (12 CFR 582.1-1), relating to satellite offices, for the principal purposes of removing the requirements that (a) a satellite office (other than a fully automated satellite office) be located within a retail sales establishment such as a department store or supermarket and (b) a fully automated satellite office be located either within such a retail sales establishment or in a shopping center, office building or transportation terminal. In addition, the Board considers it advisable to make certain minor or conforming regulatory changes relating to satellite offices.

Accordingly, the Federal Home Loan Bank Board hereby amends said § 582.1-1 by revising paragraph (a), subparagraphs (1) and (8) of paragraph (c), subparagraphs (4) and (5) of paragraph (g), and the last sentence of paragraph (g), to read as set forth below, effective January 4, 1974.

Since the above amendments relieve restrictions, the Board hereby finds that notice and public procedure with respect to said amendments are unnecessary under the provisions of 12 CFR 508.11 and 5 U.S.C. 553(b); and since publication of said amendments for the 30-day period specified in 12 CFR 508.14 and 5 U.S.C. 553(d) prior to the effective date of said amendments would in the opinion of the Board likewise be unnecessary for the same reason, the Board hereby provides that said amendments shall become effective as hereinbefore set forth.

The amendments set forth below effect the following regulatory changes:

1. Paragraph (a) of § 582.1-1, entitled "Nature of a satellite office", is revised by adding the following description of a fully automated satellite office: "A fully automated satellite office is one which is to be operated wholly by machines and without tellers or other personnel to handle transactions with the public." It is noted that this description is the same as the description of a fully automated satellite office previously in subdivision (c)(1)(v) of § 582.1-1, which subdivision has been deleted.

2. Subparagraph (c)(1) of § 582.1-1, entitled "Specific provisions", previously required a satellite office (other than a fully automated satellite office) to be located in a retail sales establishment and required a fully automated satellite office