Sunshine Act Meetings

Federal Register
Vol. 49, No. 198
Thursday, October 11, 1984

This section of the FEDERAL REGISTER contains notices of meetings published under the "Government in the Sunshine Act" (Pub. L. 94-409) 5 U.S.C. 552b(e)(3).

CONTENTS

1

EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

DATE AND TIME: Tuesday, October 16, 1984, 9:30 AM (Eastern Time).

PLACE: Clarence Mitchell Jr., Conference Room No. 200–C on the 2nd Floor of the Columbia Plaza Office Building, 2401 "E" Street NW., Washington, D.C. 20507.

STATUS: Part will be open to the public and part will be closed to the public.

MATTERS TO BE CONSIDERED:

1. Announcement of Notation Votes.
2. A Report on Commission Operations (Optional).
3. Freedom of Information Act Appeal No. 84–7–FOIA–97–SL, concerning a request for a confidential affidavit from a closed ADEA charge file.
4. Freedom of Information Act Appeal No. 84–03–FOIA–76–PA, concerning a request for documents from a closed Title VII charge file.
5. Freedom of Information Act Appeal No. 84–7–FOIA–087–CT, concerning a request for statements from a charging party.
6. Freedom of Information Act Appeal No. 84–8–FOIA–44–BI, concerning a request for recommendation decision on an EEO charge.
7. Freedom of Information Act Appeal No. 84–08–FOIA–196–MK, concerning a request for access to an age charge file.
8. Freedom of Information Act Appeal No. 84–7–FOIA–96–SL, concerning a request for access to records in a charge file.
9. Freedom of Information Act Appeal No. 84–7–FOIA–52–NO, concerning a request for a copy of all documents, memorandum, or other materials in a Title VII file.
10. Freedom of Information Act Appeal No. 84–08–FOIA–103 and 104–BA, concerning a request for access to contents of part of two charge files.
11. Discussion on Proposed Multi-Year Affirmative Action Plans for Minorities and Women (EEO–Md 707).

Closed

1. Litigation Authorization; General Counsel Recommendations.
2. Proposed Contract in Connection with a Court Case.
3. Proposed Commission Decisions: ORA Decisions and Guidance Decisions.
4. Proposed Subpoenas.

Note.—Any matter not discused or concluded may be carried over to a later meeting. (In addition to publishing notices on EEOC Commission meetings in the **Federal Register**, the Commission also provides a recorded announcement a full week in advance on future Commission sessions. Please telephone (202) 634–6748 at all times for information on these meetings).

CONTACT PERSON FOR MORE INFORMATION: Treva McCall, Executive Secretary to the Commission at (202) 634–6748.

Dated: October 9, 1984.

Treva McCall,

Executive Secretary to the Commission.

This Notice Issued October 9, 1984.

[FR Doc. 84–27013 Filed 10–9–84; 2:17 pm]

BILLING CODE 6570–06–M

2

FEDERAL RESERVE SYSTEM

TIME AND DATE: 10:00 a.m., Wednesday, October 17, 1984.

PLACE: Marriner S. Eccles Federal Reserve Board Building, C Street entrance between 20th and 21st Streets, NW., Washington, D.C. 20551.

STATUS: Closed.

MATTERS TO BE CONSIDERED:

1. Proposed acquisition of real property by a Federal Reserve Bank.
2. Personnel actions (appointments, promotions, assignments, reassignments, and salary actions) involving individual Federal Reserve System employees.
3. Any items carried forward from a previously announced meeting.

CONTACT PERSON FOR MORE INFORMATION: Mr. Joseph R. Coyne, Assistant to the Board; (202) 452–3204. You may call (202) 452–3207, beginning at approximately 5 p.m. two business days before this meeting, for a recorded announcement of bank and bank holding company applications scheduled for the meeting.

Dated: October 9, 1984.

James McAfee,

Associate Secretary of the Board.

[FR Doc. 84–27038 Filed 10–9–84; 3:54 pm]

BILLING CODE 6210–01–M

3

NATIONAL SCIENCE BOARD

DATE AND TIME: October 18, 1984, 1:30 p.m., Open Session; October 19, 1984, 9:00 a.m., Closed Session; 9:30 a.m. Open Session.

PLACE: National Science Foundation, Washington, D.C.

STATUS: Most of this meeting will be open to the public. Part of the meeting will be closed to the public.

MATTERS TO CONSIDERED AT THE OPEN SESSIONS:

Thursday, October 18, 1984—1:30 p.m.

1. Program Review—Research Initiation and Improvement

Friday, October 19, 1984—9:30 a.m.

5. Minutes—September 1984 Meeting
6. Chairman's Report
7. Director's Report
8. Reports of Board Committees
9. Board Representation at Advisory Committee and Other Meetings
10. Other Business
11. Next Meetings

MATTERS TO BE CONSIDERED AT THE CLOSED SESSION:

Friday, October 19, 1984—9:00 a.m.

2. Minutes—September 1984 Meeting
3. NSB and NSF Staff Nominees
4. Grants, Contracts, and Programs

Margaret L. Windus,

Executive Officer.

[FR Doc. 84–26977 Filed 10–9–84; 12:48 pm]

BILLING CODE 7555–01–M

4

PACIFIC NORTHWEST ELECTRIC POWER AND CONSERVATION PLANNING COUNCIL

AGENCY HOLDING THE MEETING: Pacific Northwest Electric Power and Conservation Planning Council (Northwest Power Planning Council).

ACTION: Addition of agenda item.

DATE: September 20, 1984.

PLACE: Towne Plaza Motor Inn, Yakima, Washington.

SUMMARY: The Government in the Sunshine Act, 5 U.S.C. 552b, requires Federal Register notice whenever an agency adds an item to its meeting agenda after the meeting had been publicly announced. At its September 19–20 meeting in Yakima, Washington, the Council voted to add to its agenda discussion of "Legal Considerations Relating to Transfers of Electric Power from Pacific Northwest to Pacific Southwest." By roll call vote at that meeting, the Council determined that Council business required the addition to the agenda and that no earlier notice of the addition was practicable. The addition to the agenda was publicly announced at the Council meeting.

CONTACT PERSON FOR MORE INFORMATION: Ms. Bess Wong, (503) 222–5161.

Edward Sheets,

Executive Director.

[FR Doc. 84–26978 Filed 10–9–84; 12:48 pm]

BILLING CODE 0000–00–M

5

SECURITIES AND EXCHANGE COMMISSION

FEDERAL REGISTER CITATION OF PREVIOUS ANNOUNCEMENT: (To be published).

STATUS: Closed meeting.

PLACE: 450 Fifth Street, NW., Washington, D.C.

DATE PREVIOUSLY ANNOUNCED: Thursday, September 27, 1984.

CHANGE IN THE MEETING: Additional item.

The following additional item was considered at a closed meeting held on Wednesday, October 3, 1984, at 2:30 p.m.

Institution of injunctive action.

Chairman Shad and Commissioners Cox, Marinaccio and Peters determined that Commission business required the above change and that no earlier notice thereof was possible.

At times changes in Commission priorities require alterations in the scheduling of meeting items. For further information and to ascertain what, if any, matters have been added, deleted or postponed, please contact: Angela Hall at (202) 272–3085.

Dated: October 4, 1984.

Shirley E. Hollis,

Acting Secretary.

[FR Doc. 84–26888 Filed 10–5–84; 4:26 pm]

BILLING CODE 8010–01–M

federal register

Thursday
October 11, 1984

Part II

Department of Defense

Department of the Army

32 CFR Part 544

Civilian Marksmanship; National Marksmanship Matches and Excellence-in-Competition (EIC) Matches; Final Rules

DEPARTMENT OF DEFENSE

Department of the Army

32 CFR Part 544

Civilian Marksmanship; National Marksmanship Matches and Other Excellence-in-Competition Matches; Rules and Regulations

AGENCY: Director of Civilian Marksmanship, OSA, Department of the Army, DOD.

ACTION: Final rule.

SUMMARY: This regulation on the rules and regulations for National Marksmanship Matches and other Excellence-in-Competition (EIC) matches has been revised. It gives responsibilities for the National Matches eligibility criteria and categories for the competitors, and the program for the National Trophy Matches. It also describes the awards for the National Trophy Matches. This regulation has been revised to change the staff organization of the National Matches, show new eligibility requirements and program for the National Trophy Matches, added women as a category in the matches, and introduces new awards. This regulation applies to the Active Army, Navy, Air Force, Marine Corps, Coast Guard, National Guard, Army and Marine Corps Reserve, all other personnel competing in the National Matches, and civilians in other EIC matches.

EFFECTIVE DATE: October 11, 1984.

ADDRESSES: Written comments should be submitted to the Director of Civilian Marksmanship, Attention: Lieutenant Colonel William Creech, 20 Massachusetts Avenue, NW., Room 1205—Pulaski Building, Washington, D.C. 20314–0100.

FOR FURTHER INFORMATION CONTACT: LTC William Creech at (202) 272–0810 or the above address.

SUPPLEMENTARY INFORMATION: This regulation promotes the maintenance of national defense through the promotion of competition in nationally held rifle and pistol matches. Since the stated purpose and intent of the matches is national defense the Department of the Army has determined that this regulation should be published as a final rule.

List of Subjects in 32 CFR Part 544

Armed forces, National defense, Awards, Nonprofit organizations.

Accordingly, a new Part 544 is added to read as follows:

PART 544—CIVILIAN MARKSMANSHIP

Subpart A—General

Subpart B—Responsibilities

Subpart C—Competitor Eligibility, Requirements, Categories, and Teams

Subpart D—General Rules for National Trophy Matches

General Match Rules

Team Match Rules.

Types of Firearms, Ammunition, and Other Equipment

Firing

Subpart E—Program for the National Trophy Matches

Subpart F—Awards

Sec.

Authority: 10 U.S.C. 4307 through 4313.

Subpart A—General

§ 544.1 Purpose.

This regulation prescribes the policies, procedures, and responsibilities for the National Matches and other excellence-in-competition (EIC) matches.

§ 544.2 References.

Related publications are listed in appendix A.

§ 544.3 Explanation of abbreviations and terms.

Abbreviations and special terms used in this regulation are explained in the glossary.

§ 544.4 The intent of the National Matches.

(a) The national Matches and included competitions are part of the Civilian Marksmanship Program (CMP). Sections 4307 through 4313, title 10, United States Code (U.S.C), establish the CMP to be conducted under rules approved by the Secretary of the Army (SA).

(b) As part of the CMP, these matches are intended to promote the national defense. The CMP provides and encourages voluntary marksmanship training for citizens and other persons subject to induction in the Armed Forces of the United States who are not reached by training programs of the Armed Forces and who might be called into service in an emergency. The National Matches enhance this training by offering open competition at the highest national level. Further, the statutes in a above provide that marksmanship competitions sponsored by the National Rifle Association (NRA) may be held in connection with the National Matches.

(c) The Services have established individual rifle and pistol matches at major command levels in which civilians may participate. The Services will conduct these matches according to the parts of this regulation that apply.

(d) Upon approval by the Director of Civilian Marksmanship (DCM), recognized civilian rifle and pistol clubs and State rifle and pistol associations may conduct similar matches in conjunction with NRA Regional and State Championships. The intention of all of these matches is to promote civilian marksmanship training.

§ 544.5 Composition of the National Matches.

The National Matches are composed of (a) through (e) of this section.

(a) *Small Arms Firing Schools (SAFS).* The SAFS give instruction in the service rifle and pistol, particularly the current service rifle with which civilians may not be familiar. The SAFS, also introduce the latest approved training concepts for these arms. The Army will conduct the schools and provide the Director, SAFS. Other Services, including Reserve Components, will assist at the schools. The Director, SAFS, may request Armed Forces shooting teams participating in the National Matches to provide qualified persons to serve as assistant instructors and coaches. The SA will prescribe the curriculum based on the recommendation of the National Board for the Promotion of Rifle Practice (NBPRP). The Director, SAFS, will give a certificate of satisfactory completion to those who meet the qualifications set by the NBPRP.

(b) *National Trophy Matches.* The National Trophy Matches are listed below.

(1) The President's Pistol Match.
(2) National Trophy Individual Pistol Match.
(3) National Trophy Pistol Team Match.
(4) The President's Rifle Match.
(5) National Trophy Individual Rifle Match.
(6) National Trophy Rifle Team Match.
(7) National Trophy Infantry Team Match.

(c) NRA National Rifle and Pistol Championships. The NRA National Rifle and Pistol Championships are conducted according to the NRA's rules and regulations. These championships are listed below.

(1) National Pistol Championships.
(2) National Smallbore Rifle Position Championships.
(3) National Smallbore Rifle Prone Championships.
(4) National Highpower Rifle Championships.

(d) *Additional events.* The National Matches also include events sponsored by the SA or sponsored by the NRA and arranged in coordination with the SA.

(e) *Ceremonies.* As approved by the DCM, (who is also the National Matches Installation Commander (NMIC)), the appropriate opening, closing, award, and other ceremonies are conducted as official parts of the National Matches.

§ 544.6 National Match Staff.

(a) The organization of the National Match Staff is shown in figure 1–1.

(b) The specific duties of the National Match Staff are set by the DCM/NMIC and the NRA National Match Coordinator.

(c) Key members of the National Match Staff are listed below. Their responsibilities are explained in the paragraphs cited after their titles.

(1) DCM/NMIC (§ 544.3)
(2) Executive Officer, National Matches (XO, NM)/Deputy Installation Commander (Operations/Services) (DNMIC (Ops/Svcs)) (§ 544.14 2–4).
(3) Executive Officer, Civilian Marksmanship Program (Support) (XO, CMP (SPT)) (§ 544.15).
(4) NRA National Matches Coordinator (§ 544.81–8).
(5) Match Directors (§ 544.17).
(6) Deputy Match Directors (§ 544.8).
(7) Range Director (§ 544.18).
(8) Statistical Director (§ 544.19).
(9) Director, SAFS (§ 544.20).
(10) National Matches Support Coordinator (§ 544.6).
(11) Chief, National Matches Support Detachment (NMSD) (§ 544.23).
(12) Ohio Army National Guard Facilities Manager (§544.28).
(13) Billeting Officer.
(14) US Army Reserve Command and Liaison Group Commander.
(15) Active Army Food Service Advisor.

§ 544.7 Armed Forces involvement.

The US military services will support the National Matches as follows:

(a) The Army will conduct the SAFS.

(b) As approved by the SA and subject to the availability of resources, the Army will also supply the personnel, equipment, and supplies needed to conduct the National Matches.

(c) Subject to the availability of resources, all Services will furnish personnel as requested by the DCM and approved by their respective departments. The number of personnel furnished should be proportional to the number of competitors that the

particular Service furnished in the most recent National Matches.

§ 544.8 Role of the NRA.

(a) The NRA sponsors and regulates the conduct of the NRA National Rifle and Pistol Championships. The NRA advises the SA and NBPRP on NRA participation in the National Matches. It also coordinates with the DCM and the XO, NM, on National Match matters.

(b) Unless the SA determines otherwise and by mutual agreement, the NRA conducts the National Matches for the SA. When requested to conduct the National Matches, the NRA assists the DCM/NMIC in the conduct of the schools related to the matches and provides, administers, and funds the NRA Match Coordinator, Match Directors, Deputy Match Directors, Range Director, Range Engineer, and Statistical Director and staff. (Their responsibilities are outlined in Subpart B.) The NRA also provides other personnel needed to conduct the shooting events and NRA-sponsored schools.

(c) The NRA National Match Coordinator is the principal representative of the NRA at the National Matches and conducts the NRA-sponsored events of the matches. When the NRA is requested to conduct the shooting events related to the National Matches, the NRA National Match Coordinator will also—

(1) Conduct the National Trophy Matches.

(2) Coordinate match operations with the DCM/NMIC.

(d) The NRA Match Directors will follow § 544.17.

(e) The NRA Deputy Match Directors will assist their NRA Match Director in conducting specific shooting events, groups of events, or championships.

§ 544.9 Places and dates.

The National Matches will be held each year at Camp Perry, Ohio, or at other places. The DCM and NRA will recommend the places and dates for the matches, and the SA will approve and publish them in advance. The National Matches Program, approved by the DCM and NRA, gives additional details on the matches.

§ 544.10 Fees.

When approved by the DCM, nominal administrative fees may be charged for the National Trophy Matches, the SAFS, and EIC matches approved by the DCM. The NRA prescribes fees for its NRA National Championships and its other events.

Subpart B—Responsibilities

§ 544.11 Secretary of the Army (SA).

The SA will conduct the National Matches each year. The SA will delegate this authority to the President, NBPRP.

§ 544.12 President, National Board for the Promotion of Rifle Practice (NBPRP).

The President, NBPRP, will—

(a) Act for the SA in the conduct of the National Matches.

(b) Advise the SA on the conduct of the National Matches.

(c) Receive advice of the NBPRP concerning the conduct of the National Matches.

(d) Provide guidance to the DCM governing the conduct of National Matches and approve the annual National Matches plan and expenditures.

§ 544.13 Director of Civilian Marksmanship (DCM).

The DCM, a statutory official, will—

(a) Direct and implement the National Matches as approved by the President, NBPRP, for the SA.

(b) Serve as the NMIC according to AR 600–20.

(c) When the National Match Staff (§ 544.6) is assembled for duty at the site of the National Matches, the NMIC will assign duties to the National Match Staff and be responsible to the President, NBPRP, for all National Match matters. However, when the NRA is requested to conduct the National Matches, the NMIC will not conduct the shooting events. Further, the NMIC will supervise personnel involved in conducting base operations associated with the National Matches. This supervision does not include courts martial jurisdiction.

§ 544.14 Executive Officer, National Matches (XO, NM).

The XO, NM, will—

(a) Perform the year-round planning and operations needed to conduct the National Matches. This responsibility includes recommending support requirements.

(b) Serve as the Deputy National Matches Installation Commander (Operations and Services) (DNMIC (Ops/Svcs)).

§ 544.15 Executive Officer, Civilian Marksmanship Program (Support) (XO, CMP (SPT))

The XO, CMP (SPT) will—

(a) Provide technical assistance and operational advice to all DCM-affiliated clubs and State associations that participate in the National Matches.

(b) Provide communications, supply and billeting (logistics), ammunition, and the ordnance safety officer (OSO) support to the NRA National Match Coordinator as required and directed.

(c) Insure the NBPRP trophies, medals, brassards, and prizes are available.

(d) Arrange for NBPRP awards ceremonies and receptions. Coordinate combined ceremonies.

(e) Supervise the in and out processing of DCM-supported State association and club teams.

§ 544.16 National Match Support Coordinator (NMSC).

The NMSC will be designated by the Commanding General, US Army Forces Command (CG, FORSCOM). The NMSC will—

(a) Coordinate the activities of the National Match Support Detachment during the National Matches.

(b) Assist the XO, NM/DNMIC (Ops/Svcs) with year-round planning and coordination for the National Matches.

(c) Attend meetings, conferences, and briefings concerning logistics support for the National Matches.

§ 544.17 Match Directors.

The Match Directors for Pistol, Smallbore rifle, and Highpower rifle will conduct specific shooting events, groups of events, or championships. When the Army conducts the matches, the Match Directors are responsible to the DCM/NMIC. When the NRA conducts the shooting events of the National Matches, the Match Directors are responsible to the NRA National Match Coordinator (§ 544.8(c)).

§ 544.18 Range Director.

The Range Director is responsible to the respective Deputy Match Director.

The Range Director will prepare, maintain, and operate the firing ranges. Operating the ranges includes controlling and directing all personnel, competitors, and spectators on the ranges. Normally, the Range Director is assisted by and is responsible for the functions of the following officials and others as designated:

(a) Range Safety Officer.

(b) Range Communications Officer (normally provided from the military).

(c) Range Engineer Officer.

(d) Chief Range Officer (usually one for each range).

(e) Chief Pit Officer (usually one each operating rifle range).

§ 544.19 Statistical Director.

The Statistical Director is responsible to the Match Director and will perform the statistical operations. These operations include—

(a) Insuring that match entries are correct.

(b) Checking the eligibility of competitors and teams. The Statistical Director will work with the Range Director in assigning these people to relays and targets.

(c) Verifying scores.

(d) Listing participants in order of excellence.

(e) Publishing match results in official bulletins.

§ 544.20 Director, Small Arms Firing Schools (SAFS).

The Director, SAFS, will organize and conduct the SAFS.

§ 544.21 The Commanding General, US Army Material Command (CG, AMC).

CG, AMC, will act as the procurement agent for small arms and related equipment used to support the National Matches. Also, CG, AMC, will budget for and provide—

(a) The personnel, supplies, and equipment needed for the onsite repair of service-type small arms. Such repair will be provided only if required and authorized.

(b) Technical assistance and advice regarding National Match arms, ammunition, target materiel, and related equipment.

(c) Limited logistical support as required.

(d) The OSO (§ 544.24).

§ 544.22 Chief of Public Affairs (CPA).

The NMPAO will be assigned by the SA. The NMPAO will—

(a) Be responsible to the NMIC for National Match public information and public relations matters.

(b) Conduct a program of public information to stimulate nationwide interest in the National Matches. The purpose of this program is to improve public support for marksmanship as both an important element of national defense and as a contributor to developing high personal attributes in the participants.

(c) Work with the public information activities conducted by the Services and the NRA.

§ 544.23 Chief, National Matches Support Detachment (NMSD).

The Chief, NMSD, will, through the NMSC, act as the logistics coordinator for the National Matches, supervise all National Match supply activities, and coordinate service activities. The Chief, NMSD, will—

(a) Procure, control, and issue Army-furnished supplies and equipment.

(b) Provide repair and utilities activities.

(c) Issue and/or sell ammunition or arms that are provided by the DCM and that are required and authorized.

(d) Coordinate logistical matters between National Match activities and match support organizations.

§ 544.24 Ordnance Safety Officer (OSO).

The OSO will—

(a) Investigate the circumstances leading to any weapon or ammunition malfunction that results in an accident or creates a hazardous condition at the match site.

(b) Determine the probable cause of a malfunction and insure the problem has been resolved before the weapon or ammunition is returned to the firing line.

(c) Report to the Match Director, in writing, about an incident or malfunction that has called for his or her services.

§ 544.25 Commanding General, US Army Forces Command (CG, FORSCOM).

The CG, FORSCOM, will—

(a) Appoint the NMSC.

(b) Budget for and provide personnel and other support and services as required by the National Matches Support and Operations Plan.

§ 544.26 Commanding General, US Army Training and Doctrine Command (CG, TRADOC).

The CG, TRADOC, will budget for and provide services and equipment in the areas of communications, facilities engineering, food service, medicine, maintenance, supply, transportation, procurement and contracting, and other areas as may be required by the National Matches Support and Operations Plan. The CG, TRADOC, will also provide comptroller assistance as required.

§ 544.27 Commanding General, US Army Communications-Electronics Command (CG, CECOM).

The CG, CECOM, will budget for and provide selected items of signal equipment as set forth in the National Matches Support and Operations Plan.

§ 544.28 Adjutant General, Ohio National Guard.

(a) Per existing leases and contracts, the Adjutant General, Ohio National Guard, will provide personnel, services, facilities, and equipment to the maximum extent possible to support and conduct the National Matches.

(b) Additional support that may be requested that is not provided for elsewhere, may be provided for when concurred in by the Adjutant General, Ohio National Guard, and approved by the National Guard Bureau as appropriate.

Subpart C—Competitor Eligibility, Requirements, Categories, and Teams

§ 544.29 Eligibility for the matches.

(a) The National Trophy matches are open to all US citizens 16 years of age or older, any other persons subject to induction in the US Armed Forces, and all members of the US Armed Forces, both Regular and Reserve Components. The minimum age may be waived. (Requests for waivers, with justification, must be submitted to the DCM before the opening date of the National Matches.)

(b) Other EIC matches noted in § 544.30 are open as described in (a) of this section. However, there are restrictions for these matches. These restrictions are described in §§ 544.30 (c) and (d) and 544.94. Further restrictions for Service personnel are described in the regulations of their own Service. The match sponsor may waive the minimum age requirement. Requests for waiver will be submitted to the sponsor as explained in the match program. These requests must include a justification. For example, an acceptable justification is that the person is classified by the NRA as a Sharpshooter or higher or has completed an EIC match with the arm concerned.

(c) Competitors designated Distinguished with the arm concerned may enter the National Trophy Matches and other EIC matches. Non-Distinguished competitors cannot enter any EIC match on a noncredit basis (such as entering for practice).

(d) Non-Distinguished military competitors may not enter EIC matches at NRA Regional or State championship matches if these competitors have earned, with the arm concerned, the maximum credit points their Service allows for such matches.

(e) The SAFS are open to all US citizens, any other persons subject to induction in the US Armed Forces, and all members of the US Armed Forces, both Regular and Reserve Components. To attend the SAFS, a person must not necessarily compete in the National Matches. For pistol instruction, a person must be 16 years old or older; for rifle instruction, 12 years old or older.

§ 544.30 Requirements for competitors in individual matches.

(a) All competitors must state on their entry forms whether their status is Distinguished or non-Distinguished.

(b) For the National Trophy Matches, non-Distinguished military competitors must advise the DCM when, per their Service's regulations, they cannot be credited with points earned in National

Trophy Matches. Competitors must advise the DCM before the matches and in writing.

§ 544.31 Requirements for military competitors.

Military competitors (Regular and Reserve Components) who compete in the National Matches and whose transportation or other expenses connected with the matches are paid, wholly or in part, from appropriated or quasi-official Government funds must meet special requirements. (Examples of quasi-official Government funds are funds for exchanges, recreation, and morale.) These competitors will—

(a) Participate in the appropriate SAFS.

(b) Enter and complete the appropriate National Trophy Individual Match and President's Match if eligible under this regulation, unless eliminated from the match.

(c) Enter and complete the appropriate National Trophy Team Matches if eligible under this regulation and selected by the team captain, unless eliminated from the match.

(d) Fire a service rifle (authorized by § 544.51) at ranges of 200 through 600 yards in both the NRA and the National Trophy Rifle Matches, unless exempted in the current match program. These military competitors may also use other rifles at greater ranges.

§ 544.32 Requirements for certain civilian competitors.

Civilian competitors in the National Trophy Matches whose transportation or other expenses connected with these matches are paid, wholly or in part, by the DCM must meet special requirements. These competitors will—

(a) Attend the appropriate SAFS.

(b) Enter and complete the appropriate National Trophy Individual Match and President's Match, unless eliminated according to § 544.41.

(c) Enter and complete the appropriate National Trophy Team Matches if selected by a team captain, unless eliminated according to § 544.41.

§ 544.33 Competitor categories for National Trophy Matches.

Competitors may register and participate in only one of the following categories:

(a) *Regular Service.* (1) This category consists of—

(i) Regular Service personnel on active duty.

(ii) National Guard and Reserve personnel on extended active duty with active forces of 90 days or more with a Regular Service status under Title 10 USC.

(2) This category does not include enrolled undergraduates of the Service academies.

(b) *Reserve.* This category consists of members of any Reserve branch of the US Armed Forces who are not on extended active duty as in (a) above. It includes Fleet Reserve but excludes Fleet Marine Corps Reserve. This category also excludes Army or Air National Guard and ROTC. If also qualified under § 544.83 (e) and (f)(3), Reserve members may instead register and participate in one of those categories.

(c) *National Guard.* This category consists of members of the Army or Air National Guard who are not on extended active duty as in a(1)(b) of this section. If also qualified under §§ 544.33 (e) or (f)(3), National Guard members may instead register and participate in one of those categories.

(d) *Service Academy and Reserve Officers Training Center (ROTC).* (1) This category consists of enrolled undergraduate members of—

(i) The Service academies of the Armed Forces.

(ii) Any high school or college Army, Navy, or Air Force ROTC unit.

(2) If also qualified under (f)(3) of this section, Service Academy and ROTC members may instead register and participate in that category.

(e) *Police.* This category is defined in NRA Rule 2.4. If also qualified in the Reserve, National Guard, or Civilian categories, police may instead register and participate in one of those categories.

(f) *Civilian.* This category consists of competitors listed in § 544.33(f)(1) through § 544.33(f)(3). Reserve or National Guard category personnel who elect to compete as civilians under § 544.33(f)(3) may not revert to a Reserve or National Guard category later, unless the proper authority orders them to active duty for a purpose other than marksmanship competition. The penalty for noncompliance will be determined by the DCM.

(1) Individuals who are not in the Regular Service, Reserve, National Guard, Service Academy and ROTC, or Police categories.

(2) Retired service (Regular, Reserve, or National Guard) and Fleet Marine Corps Reserve personnel. However, if qualified in the Police category, they may instead register and participate as Police.

(3) Members of the Reserve, National Guard, Service Academy and ROTC, or Police categories who, during the current calendar year, have not—

(i) Competed with the arm concerned in any of the Reserve, National Guard, Service Academy and ROTC, or Police categories.

(ii) Received support for any competition in the form of arms, ammunition, or travel expenses, wholly or in part, from organizations in the Reserve, National Guard, and Service Academy and ROTC categories. Do not include as support the arms or ammunition provided for a specific competition (such as National Trophy or other EIC matches) when such items are available to all competitors within the calendar year.

(g) *Junior.* This category consists of civilians who will not reach 20 years old by the end of the calendar year. Juniors may compete on Civilian teams if they are eligible. Individuals who have National Guard, Reserve, or Regular Service status may not compete as juniors.

(h) *Women.* This category consists of females belonging to a particular and usually specified category (as by birth, residence, or membership).

§ 544.34 Team member eligibility.

For teams to be eligible to compete, the following requirements must be met:

(a) No person may be a team captain, firing member, or alternate member of a team unless he or she is qualified in the category the team represents. (Categories are listed in § 544.33.) This rule does not apply to police on State Civilian teams as authorized in § 544.34(f)(1). Nor does it apply to qualified juniors on Civilian teams.

(b) Individuals must be bona fide members of the organization and category represented for at least 30 days before the opening date of the matches.

(c) Members of State Civilian, State Junior, State fraternal-type Police organization, or club teams must be bona fide residents of the State that the team represents or in which the club is located. Further, they must have lived in that State for at least 30 days before the opening date of the matches.

§ 544.35 Authorized teams in National Trophy Team Matches.

The categories of teams that may enter the National Trophy Team Matches and the number that may enter in each category are listed below.

(a) *Regular Service.* Two teams may represent each Service (the Army, Navy, Marine Corps, Air Force, and Coast Guard).

(b) *Reserve.* Two teams may represent the Reserve branch of each Service (the Army, Navy Air Force, Marine Corps, and Coast Guard).

(c) *National Guard.* Two teams may represent the National Guard at large.

Such teams may be composed of both Army National Guard and Air National Guard personnel.

(d) *Service Academy and ROTC.* One team from each Service academy may participate in the match. One team from each Army ROTC region, Naval Base Command, and Air Force ROTC Liaison Area within the continental United States (CONUS) may participate. ROTC members from units outside CONUS will compete on ROTC teams as authorized by the DCM.

(e) *Police.* One or more teams may represent each bona fide organized Federal, State, county, or municipal agency having law enforcement police powers. Also, one or more teams may represent a State, Commonwealth, Territory, or District of Columbia police organization of a fraternal nature. Fraternal organizations may enter only if they are organized according to AR 920–20 and affiliated with the DCM, or they are organized as a club and in good standing under the rules of the NRA. However, the entry of more than one team per fraternal organization will be subject to the availability of range facilities.

(f) *Civilian and Junior.* (1) One or more State Civilian teams and one or more State Junior teams may represent the DCM-affiliated State association of each State, Commonwealth, Territory, and the District of Columbia. However, the entry of more than one team per organization will be subject to the availability of range facilities. Also, only one State Civilian team and State Junior team may be supported by the DCM through payment of travel and subsistence expenses on a cost sharing basis. Each State Civilian team in the National Trophy Pistol Team Match may include two police officers; however, the officers must not be members of a police organization that enters a team in the same match.

(2) One or more Civilian teams and one or more Junior teams may represent a club. The club must be organized according to AR 920–20 and in good standing on the rolls of the DCM, or it must be organized and in good standing under the rules of the NRA. The entry of more than one team per club will be subject to the availability of range facilities.

§ 544.36 Requirements for new shooters in National Trophy Team Matches.

(a) *Regular Service, Reserve, and National Guard Teams.* Pistol teams will have at least one firing member who has never fired before as a member of any team that has competed in the particular event. Rifle teams will have at least two such firing members.

(b) *Civilian and Police teams.* These teams will have at least one firing member who has never fired before as a member of any team that has competed in the particular event.

(c) *Service Academy, ROTC, and Junior teams.* There are no requirements for new shooters on these teams. Having fired as a member of a Service Academy or ROTC team or as a junior member of a Civilian team is not considered previous participation. It will not disqualify a competitor from being a member of teams in a and b above.

Subpart D—General Rules for National Trophy Matches

General Match Rules

§ 544.37 National Trophy and EIC match rules.

(a) NRA rules will apply unless changed by this regulation or as stated in § 544.37(b).

(b) The XO, NM, or the corresponding official in another EIC match, may alter, the NRA rules for a particular match only if such action is needed to complete the match successfully. If any alterations are made, the XO, NM, or the corresponding official must immediately report the details in writing to the President, NBPRP (ATTN: DCM).

§ 544.38 Entries.

(a) Individual entries will be made in advance as prescribed in the match program. Post entries will be accepted if the established post entry fee is paid, range space is available, and the acceptance of the post entry will not interfere with match operations. The following individual entry forms may be obtained by request to the Statistical Director or the DCM:

(1) DA Form 1342 (Entry and Score Card for Individual Pistol Match) or a substitute form approved by the DCM.

(2) DA Form 1344 (Entry and Score Card for Individual Rifle Match) or a substitute form approved by the DCM.

(b) Team match entries will be made by team captains using official forms provided by the Statistical Director. Team captains will—

(1) Enter the following data on the team entry form.

(i) The full official name and address of the organization their team represents. Civilian, Junior, and Police teams will be recognized as representing a particular State, Commonwealth, Territory, the District of Columbia, or DCM- or NRA-affiliated organization only if attested to on the form by an official of the organization represented.

(ii) The category under which the team will enter according to § 544.33.

(iii) Further identification of the organization's team name (such as "Blue," "Jones," or the like) if the organization enters more than one team.

(iv) The designations of team officials and other members.

(v) Each member's correct first name, middle initial, last name, home address, and if applicable, the member's grade and official military mailing address.

(vi) A statement by the team captain that the team is certified under this regulation.

(2) Submit entry forms at the match site as prescribed in the match program. Entries by mail will not be accepted.

(c) Incomplete or inaccurate entry forms or the use of the wrong form may cause the entries to be refused or the individual or team entrant to be disqualified.

(d) Entries will be accepted on a first-come, first-served basis until range capacity is filled.

§ 544.39 Directives competitors must follow.

(a) The competitor must know and comply with this regulation, the Official Match Program, and the NRA rules and Match bulletins that apply.

(b) In team matches, the team captain will insure that team members comply with a above.

§ 544.40 Coaching.

Coaching is not permitted in individual matches; it is permitted only in team matches. Usually, coaching is permitted only within the team, but there are exceptions to this rule:

(a) Service members will coach teams of their respective Services, and only Service members may coach Service Academy and ROTC teams. They may also coach Police, Civilian, and Junior teams.

(b) Upon request by a Civilian, Junior, or Police team, the XO, NM, will assign a coach from among qualified and available Service personnel.

§ 544.41 Elimination of teams or individuals.

The XO, NM, or the corresponding official in matches may establish standards by which individuals and teams of the lowest standing may be eliminated after the first stage of a match is completed.

§ 544.42 Penalties.

(a) Any person interfering with or annoying a competitor on the firing line will be warned by a range official to stop. If the offender does not stop, he or she will be disqualified from that match and ordered off the range immediately.

(b) If the XO, NM, finds a competitor guilty of any of the offenses below, the competitor may be disqualified from competing further in the current National Trophy Matches. Further, the competitor may be denied any award won during the current matches. However, these penalties will be imposed only if the competitor is found guilty. The offenses are—

(1) Violating range safety regulations or the safety precautions prescribed in this regulation.

(2) Firing under an assumed name.

(3) Firing under a name other than the one on the entry form.

(4) Firing more than once for the same award.

(5) Falsifying scores or being an accessory to falsifying scores.

(6) Offering any person a bribe relating to a match.

(7) Evading the conditions prescribed for a match.

(8) Refusing to obey the instructions of a match official.

(9) Disorderly conduct.

(10) Being guilty of conduct that the XO, NM, considers a discredit to the National Matches, their sponsors, or the intended purposes of the matches.

§ 544.43 Competitors verifying their scores.

The competitor in individual matches and the team captain in team matches must verify the score card. Verification includes checking the names on the card, the value of each shot, and all other data and then signing the card. The signature acknowledges the card is correct. Should a competitor or team captain sign an incorrect score card or leave the firing line without signing the card, no challenge or protest concerning data recorded on the card will be allowed. If the competitor or team captain wants to protest data recorded on the card, he or she will write the word "Protested" above the signature and follow the procedure prescribed in § 544.45.

§ 544.44 Referees, scoring, and challenge procedures.

NRA rules cover the use of referees and scoring and challenge procedures. Exceptions are listed below.

(a) The Match Director will appoint an Official Referee and Assistant Referees are required, including Scoring Referees for Pistol matches.

(b) If a competitor (in individual matches) or a team captain (in team matches) is not satisfied with the score announced by the scorer, the competitor or team captain may challenge it. They must pay a challenge fee (c below) to have the Referee settle the disputed score. The Referee's decision will be final. For pistol matches, the decision of the Scoring Referee is final. For rifle matches, the decision of the Pit Officer is final.

(c) The XO, NM, will establish the challenge fee. When the Referee's decision is not in favor of the competitor or team member, the challenge fee will be delivered to the XO, NM, for deposit into the National Match Fund. If the decision is in favor of the competitor, the challenge fee will be returned.

§ 544.45 Protests.

(a) Competitors (in individual matches) or team captains (in team matches) may protest any decision or injustice that they believe unfairly affects the competition. Protests may be in such areas as competitor or team eligibility, the conditions of firing (including the conditions under which another competitor is permitted to fire), or the equipment allowed. However, competitors or team captains may not protest the score of a target. In this case, they must challenge the score according to § 544.44.

(b) A protest must be made when the incident occurs and according to the steps below. Failure to comply with these steps may void a protest.

(1) State the complaint orally to the Chief Range Officer or to the Statistical Director, as appropriate, for a decision. If not satisfied with that decision, then follow § 544.45(b)(2).

(2) State the complaint orally to the Official Referee for a decision. If not satisfied with that decision, carry out § 544.45(b)(3) within 2 hours after completing the match.

(3) File a formal, written protest with the Official Referee. State all the facts the protest is based on. As quickly as possible, the Official Referee must send this protest to the National Trophy Match Protest Committee. The Official Referee will include his or her own statement concerning the alleged facts, any other facts considered pertinent to the case, and copies of related documents such as entry forms and score cards.

(c) The National Trophy Match Protest Committee will sit at the match site. The committee will consist of three or more members appointed by the Match Director. The Match Director will not appoint competitors or team or match officials participating in the match being protested. The decision of the committee will be final.

§ 544.46 Bulletins.

Preliminary bulletins showing award winners will be published at the match site. Complete, final official bulletins showing the scores for all competitors, including all firing members of teams, will be published by the Statistical Director in coordination with the DCM/NMIC. The bulletins will be published as soon as possible after the matches are completed.

Team Match Rules

§ 544.47 Team composition.

Each team will include the number of firing members required by the match conditions to fire for score. A team may include up to two alternate firing members who are eligible to fire as substitutes. (Follow NRA Rule 12.4 when using substitutes.) Each team will have a designated team captain and may have a designated team coach. (See para 4-4 on when coaches are allowed and who may serve as a coach.) The captain and coach may be firing members or alternates if eligible, and must be listed as such on the team entry form. (§§ 544.36 and 544.38 discuss new shooter requirements and team member eligibility.)

§ 544.48 Team squadding.

(a) All teams will be assigned the same number of targets.

(b) In rifle team matches, slow fire will be conducted with two firers assigned to a single target. This is known as pair firing. If firing points are too narrow to permit this procedure, each team may be assigned one or more adjoining firing points, provided all teams fire concurrently. When enough targets are available, each team may be assigned more than one target. However, in this case, each team must be assigned the same number of targets.

(c) When two competitors are assigned to a single target (pair firing), they will fire alternately. The competitor on the right will fire first. A shot fired out of turn will be scored as a miss. A range official may require a left-handed competitor to be on the left of a pair.

(d) Team captains may place team members on assigned targets in any order they choose. They may change the order of a team member firing between stages, in each case notifying the scorer.

§ 544.49 Station and duties of team coaches.

(a) In the slow fire stages of rifle matches, the team coach's station will be between the pair on the firing line. If only one member is firing, the station will be directly behind the member. In rapid fire stages, the station will be directly behind the member firing.

(b) In pistol team matches, one coach is allowed for each team. When the team is on the firing line, the team

coach's station will be directly behind the team member or members firing.

(c) In pair firing, the positions of the coach or competitors may not be shifted to form a windshield for a firer.

(d) When the team is on the firing line, coaches will be confined to the prescribed station and to the activities normally expected of a coach. Coaches may assist team members by calling shots, checking time and scores, ordering sight changes, and so on. However, coaches may not physically assist in loading, making sight changes, or in assuming positions. Also, they must control their voices and actions so as not to disturb other competitors. In communicating with the team, coaches will not use electrical or mechanical means.

§ 544.50 Stations of team captain.

When a team is on the firing line, the team captain and one assistant may be stationed in front of the ready line and slightly behind the coach. The captain is positioned there to observe team operations and the scorekeeping. The team captain may not assist in coaching unless occupying the coach's station. The captain may talk with the coach if it does not distract firers on the firing line. The captain may not talk to the firer.

Types of Firearms, Ammunition, and Other Equipment

§ 544.51 Description of arms to be used.

(a) US rifle, caliber .30 M1. Competitors may use the caliber .30 M1 as issued by the US Army, a commercial rifle of the same type and caliber, or either rifle if chambered for 7.62mm. The requirements for these rifles are listed below.

(1) The trigger pull must be at least 4½ pounds.

(2) A standard issue type wood or synthetic material stock and standard issue type leather or web sling must be used.

(3) Sling cuffs and sling pads are not permitted. Hooks, buttons, straps, or other similar devices fastened to the shooting coat for the purpose of holding the sling in place are prohibited.

(4) The gas system must be fully operational.

(5) The front and rear sights must be of US Army design for this rifle, but the dimensions of the rear sight aperture and front sight blade may vary.

(6) External alterations to the assembled arm are not allowed.

(7) These rifles may be modified internally to improve functioning and accuracy. A special match barrel may be installed. Synthetic materials may be applied to the interior of the stock to improve the bedding. Modifications must not interfere with the functioning of the rifle and safety devices as manufactured. Also, modifications must not change the configuration or appearance of the assembled arm.

(b) US rifle, caliber 7.62mm M14 series. Competitors may use the caliber 7.62mm M14 series as issued by the US Army or a commercial rifle of the same type and caliber. The requirements for these rifles are listed below.

(1) The trigger pull must be at least 4½ pounds.

(2) A standard issue type wood or synthetic material stock must be used. The stock must not be more than 2 inches wide at a point immediately to the rear of the front band and not more than 2.5 inches wide at the front and rear of the receiver. The width at the receiver may be carried through to the butt plate. The stock must have a continuous taper from receiver to front band.

(3) A standard issue type leather or web sling must be used. Sling cuffs and sling pads are not permitted. Hooks, buttons, straps, or other similar devices fastened to the shooting coat for the purpose of holding the sling in place are prohibited.

(4) The gas system must be fully operational. To improve operation, the gas cylinder plug may be altered by making an axial hole that is approximately 1/64th inch in diameter in the center of the plug.

(5) The front and rear sights must be of US Army design for this rifle, but the rear sight aperture and front sight blade may vary in dimensions.

(6) The rifle must be adjusted so that automatic fire is impossible without removing the stock and changing or altering parts.

(7) The standard 20- or 30-round box magazine must be attached during the firing of all courses and in all positions.

(8) The hinged butt plate will be used only in the folded position.

(9) External alterations to the assembled arm are not allowed.

(10) The rifle may be modified internally to improve functioning and accuracy. A special match barrel may be installed. Synthetic materials may be applied to the interior of the stock to improve the bedding. Modifications must not interfere with the proper functioning of the rifle or safety devices as manufactured. Modifications must not change the configuration or appearance of the assembled arm.

(c) US rifle, caliber 5.56mm M16 series. Competitors may use the caliber 5.56mm M16 series as issued by the US Armed Forces or a commercial rifle of the same type and caliber. The US rifle caliber 5.56mm M16A2 or its commercial equivalence is not authorized under these regulations. The requirements for these rifles are listed below.

(1) A bipod or grenade launcher will not be used.

(2) The trigger pull must be at least 5 pounds.

(3) A standard issue type stock, pistol grip, handguard, and web sling must be used.

(4) The rifle must be modified so that automatic fire is impossible without removing, replacing, or altering parts.

(5) The standard 20- or 30-round box magazine must be attached during the firing of all courses and in all positions.

(6) The gas system must be fully operational.

(7) External alterations to any part of the assembled arm are not allowed. However, an external device may be attached to prevent selector level movement to the auto position.

(8) The front and rear sights must be the standard design for this rifle as issued by the US Armed Forces.

(9) Hooks, buttons, straps, or other similar devices fastened to the shooting coat for the purpose of holding the sling in place are prohibited.

(d) US pistol, caliber .45M1911 or M1911A1. Competitors may use the caliber .45M1911 or M1911A1 as issued by the US Armed Forces or a commercial pistol of the same type and caliber. The requirements for these pistols are listed below.

(1) A standard issue stock of wood or synthetic material, a similar stock of commercial manufacture, or another comparable design that does not interfere with the functional or maintenance features of the pistol must be used. The stock must be functionally identical for right or left hand use.

It must not—

(i) Be more than 1½ inches thick between the right and left side extremities.

(ii) Cover the mainspring housing.

(iii) Prevent holstering in the standard service holster.

(2) The trigger pull must be at least 4 pounds.

(3) The pistol will have open sights only. The front sight must be nonadjustable. The rear sight may be adjustable and must have an open "U" or rectangular notch. The distance between sights, measured from the apex of the front sight to the rear face of the rear sight, must not be more than 7¼ inches.

(4) The forestrap of the grip may be checkered or stippled.

(5) The mainspring housing may be either the straight or the arched type, and may be checkered or stippled.

(6) Trigger shoes and trigger stops, internal or external, may be used.

(7) External finishes may be blued, parkerized, or bright. All other external alterations, additions, or changes to the appearance or configuration of the assembled arm are prohibited, except that the ejection part may be lowered to aid in ejection.

(8) The pistol may be modified internally to improve functioning and accuracy. (For example, a special match barrel may be fitted.) However, the modifications may not interfere with the proper functioning or safety devices of the arm as issued by the US Armed Forces. All safety features must operate properly.

§ 544.52 Rifles and pistols available.

Under rules announced by the DCM, National Match-grade rifles M14 and M1 and pistol M1911 series will be made available at the National Matches for temporary loan to participants.

§ 544.53 Checking firearm characteristics.

The competitor will insure that his or her firearm is safe and meets the requirements of § 544.51. At any time, the XO, NM, may direct the weighing of triggers with official test weights and may check other functions and component parts.

§ 544.54 Use of the same firearm by more than one competitor.

More than one competitor may use the same firearm in a match if squadding permits, but special squadding for this purpose is not authorized.

§ 544.55 Disabled firearm.

Within 30 minutes of the time the appropriate range official declares a firearm disabled, the competitor must repair or replace the firearm and report with it to a range official. A replacement firearm, if authorized, must be of the same type and caliber as the disabled firearm.

§ 544.56 Ammunition.

Range personnel will issue Government special match, match-grade, or service-grade service ammunition at the firing line. A single lot will be used if feasible, but more than one lot may be used if circumstances require. Competitors will fire only this ammunition and none other. Competitors will be disqualified if ammunition issued to them is altered in any way. Competitors will also be disqualified if any other ammunition is found about their person or equipment while they are on the firing line. However, if the match sponsor does not make 5.56mm ammunition available, competitors using the M–16 series rifle or commercial equivalent will use their own safe ammunition.

§ 544.57 Targets.

The following target will be used:

(a) Pistol targets.

(1) For firing at 50 yards, use the Standard American 50-yard pistol target with the X, 10, 9, and 8 rings black (NRA B–6 target).

(2) For firing at 25 yards, use the Standard American 25-yard, rapid fire pistol target. Use the same dimensions as § 544.57(a)(1) of this section, but with only the X, 10, and 9, rings black (NRA B–8 target).

(b) Rifle targets (except in the National Trophy Infantry Team Match).

(1) For firing at 200 yards or meters, use the standard US Army, short range (200 to 300 yards or meters), competitive rifle target with the X, 10, and 9 rings black (NRA SR target).

(2) For firing at 300 yards or meters, use the same target and distance as in § 544.57(b)(1) of this section, except the aiming black is enlarged to include the 8 ring (NRC SR–3 target).

(3) For firing at 600 yards, use the standard US Army target, midrange (500 to 600 yards or meters), competitive rifle target with the X, 10, 9, 8, and 7 rings black (NRA MR–1 target).

(c) For the National Trophy Infantry Team Match, use the targets described in § 544.79(c)(4).

§ 544.58 Field glasses, telescopes, and binoculars.

In the Infantry Match, the team captain and coach will not be permitted to use field glasses or binoculars of greater power or objective lens diameter than 10 x 50. Binoculars will be provided on the firing line for teams requiring them. The team captain and coach may use a telescope behind the assembly line for the purpose of reading the wind before the start of their team relay. These telescopes will not be used for coaching after the targets have appeared for the team and may not be displaced forward of the assembly line.

Firing

§ 544.59 Safety precautions.

(a) Arms will be loaded only at a firing point and only when directed by a range official for authorized firing.

(b) Unless competitors are at a firing point and the range official has given the order to load, they must keep—

(1) The magazines must be removed from the firearm.

(2) The slides or bolts locked back.

(3) The safeties of rifles on.

(c) During and until their arms are unloaded, competitors will—

(1) Keep their pistols at the raised (or ready) pistol position or hold them on the bench and pointed downrange at the target.

(2) Keep their rifles pointed downrange at the target.

§ 544.60 Organization of firing areas.

The firing areas on each range will be organized into a firing line, a ready line, and an assembly line.

§ 544.61 Station of competitors.

Each competitor will remain on or behind the assembly line until the competitor's assigned relay is called to the ready line or firing line. Without the Range Director's permission, only the following people will be allowed forward of the assembly line:

(a) The officials of the matches.

(b) NBPRP members.

(c) Team officials.

(d) Competitors on the ready line and on the firing line.

(e) Scorers.

(f) Others on duty.

§ 544.62 Target assignments and operations in the rifle matches.

(a) The Statistical Director will assign targets and relays. Competitors may obtain these assignments at times announced by the Statistical Director. Before the matches start, target assignments will be posted at a convenient location.

(b) Each team will assign two target pullers to work in the pits. Target pullers must be physically able and experienced in handling targets for high power rifles. Failure to provide capable target pullers may disqualify the team involved. Both target pullers will go to the target assigned to their team. Before the firing starts, one puller will be reassigned at random by the chief pit officer.

(c) Firing will not be interrupted for changes of pit personnel. Once firing has started, and if other conditions permit, the match will continue until all firing is completed.

§ 544.63 Slow target operation in rifle matches.

In individual matches, if a competitor believes a target is operating slowly he or she must complain to a line official. In team matches, the team captain makes the complaint. Complaints must be made before completing a firing stage and in ample time to enable the line official to check the time used. The line official will check the time used by the competitor and by the target operators and make adjustments as needed. When there is no complaint to a line official by the competitor or team captain, it will be

assumed the target was operated satisfactorily.

§ 544.64 Practice firing.

During the SAFS, the only firing permitted is that scheduled in the school curriculum. At other times, practice firing may be allowed if the match program states that it is allowed at the range and range personnel are available.

§ 544.65 Firing procedure and punctuality.

(a) Matches will be fired in relays. The XO, NM, may decide whether to allow infiltration squadding in slow fire stages of rifle matches.

(b) After a relay is called to the firing line, competitors on that relay will be allowed 3 minutes in which to prepare to fire. Competitors will not be allowed to take positions on the firing line after the 3-minute preparation time expires, and they will lose their right to fire if they arrive after that time. They may regain their right to fire only if they present satisfactory evidence to the XO, NM, that the delay was the fault of the range operating personnel.

(c) In team matches, only the first pair of competitors for a team need to be present at the time the firing is scheduled to commence.

§ 544.66 Firing positions.

NRA Rule 5.5 on firing positions will apply. The rules for rifles are as follows:

(a) *Standing.* The sling must be attached to the rifle at both standard attachment points, in the parade position, and contained within the grasp of the supporting hand. On the M–14 rifle, the sling may rest along either the side or the bottom of the magazine. The sling may not be used for support, except as provided for in the National Trophy Infantry Team Match rules.

(b) *Kneeling.* Use of a kneeling roll or pad is prohibited.

(c) *Using ground cloths or ground pads.* Ground cloths or ground pads may be used if they do not provide artificial support. They may not be used in the National Trophy Infantry Team Match.

§ 544.67 Loading and reloading a rifle in rapid fire.

NRA Rule 9.22 applies in all matches except the National Trophy Infantry Team Match. In this match, team captains will direct loading and reloading.

§ 544.68 Unauthorized firing.

No firing is allowed except at authorized targets in prescribed practice or competition and under the supervision of assigned officials. Violation of this rule may disqualify the offender for the rest of the matches.

§ 544.69 Time limits and extensions.

(a) Time limits are prescribed in NRA Rules, section 8.

(b) The range official may extend the time in the slow fire stages if delays are caused by—

(1) Target malfunctions.

(2) Slow or improper target operation.

(3) Reasons over which the competitor or team has no control.

§ 544.70 Sighting shots.

Sighting shots are not allowed in any National Trophy Matches.

§ 544.71 Competitors serving as range officials.

In the match program, the Match Director or the Range Director may require competitors to score, operate, or mark targets or serve as range officials; in team matches, they may require a team to furnish scorers for teams firing on adjacent targets. The XO, NM, may disqualify from further participation a competitor who is detailed to perform such duties and fails to do so satisfactorily.

Subpart E—Program for the National Trophy Matches

§ 544.72 The President's Pistol Match.

Table 5–1 gives the course of fire for this match.

§ 544.73 National Trophy Individual Pistol Match.

Competitors will use the National Match Pistol Course as the course of fire. Table 5–2 gives this course of fire.

Other EIC individual pistol matches will schedule this course of fire.

§ 544.74 National Trophy Pistol Team Match.

(a) Team composition. Four members fire for the team's score.

The team will consist of a team captain, team coach, four firing members, and up to two alternates.

(b) Course of fire. Each firing member will use the National Match Pistol Course (table 5–2).

§ 544.75 The President's Rifle Match.

Table 5–3 gives the course of fire for the President's Rifle Match.

§ 544.76 National Trophy Individual Rifle Match.

(a) Course A is the National Match Rifle Course. Only Course A will be scheduled in the National Trophy Matches. Table 5–4 gives this course of fire. Other EIC individual rifle matches will consist of the National Match Rifle Course A except as described in b below.

(b) Course B is restricted to the M16-series rifle or commercial rifle of the same type and caliber (§ 544.51). This course may be scheduled for EIC individual rifle matches other than those in the National Trophy Matches. Table 5–5 gives this course of fire.

§ 544.77 National Trophy Rifle Team Match.

(a) Team composition. Six members fire for the team's score. The team will consist of a team captain, a team coach, six firing members, and two alternates.

(b) Course of fire. Course A of the National Match Rifle Course will be used for each firing member. Table 5–4 gives this course of fire.

§ 544.78 The National Trophy Infantry Team Match.

(a) Team composition. Six members fire for the team's score. The team will consist of a team captain, team coach, six firing members, and two alternates.

(b) Course of fire. Table 5–6 gives the course of fire for this match.

(c) Conditions. (1) A sling may be used for support in all positions.

(2) On the 600-yard firing line, 384 rounds of ammunition of one caliber will be issued to each team. This ammunition is the team's total for the match. The team captain will divide the ammunition among firing members and stages and decide the number of rounds to be loaded into clips or magazines.

(3) Each team will use eight adjoining targets. Gaps in the target line will separate one team's targets from another.

(4) For firing at 600 and 500 yards, a standard 600-yard target will be pasted on a standard competitive target frame. The face of the target will be reversed to display a solid white background. The Army "E" silhouette target will be pasted on this background and centered horizontally, with the top of the silhouette 13 inches below the top of the frame. For firing at 300 and 200 yards, the Army "F" silhouette target will be pasted over the face of a standard 200-yard target, with the top of the silhouette located at the top of the 8 ring.

(5) Teams will take firing positions on the 600-yard firing line as directed by the team officials. Only the captain, coach, and firing members will be permitted on the firing line during the match. After teams are in firing position with rifles loaded and locked, they may start firing when the targets appear. The targets will be withdrawn after 50 seconds. Between stages, teams will move forward abreast in a line. Their rifles will be unloaded, magazines removed, bolts open, and muzzles elevated and pointed downrange. The

firing procedure at each range will be the same as those at 600 yards. Each relay will complete the match before the next relay is called to the 600-yard firing line.

(6) Scoring. (a) All scores will be recorded on the firing line at the end of each stage. Spotters will indicate hits on the silhouettes only.

(ii) Hits on the silhouettes will count 4 points at 600 yards, 3 points at 500 yards, 2 points at 300 yards, and 1 point at 200 yards. Hits outside the silhouettes will not be scored or marked.

(iii) A bonus for distribution will be computed. At each range, count the number of silhouette targets that contain six or more hits each. Square that number, then add the square to the total hit score for that range.

(iv) Ties will be broken by the highest team score at the longest range. If the tie cannot be broken by that score, use the highest team score at the next longest range, and so on.

(7) No alibis will be allowed for misfires, disabled pieces, or other failures of range or team equipment or personnel.

(8) Telescopes and field glasses may be used as follows:

(i) Before the start of the team's relay, the team captain and coach may use a telescope behind the assembly line. These telescopes will neither be moved forward of the 600-yard assembly line nor be used for coaching after the team's preparation period starts.

(ii) After the team's preparation period starts, the captain and coach may use field glasses. However, the power and objective lens diameter of the glasses must not be more than 10 × 50mm. Field glasses will be provided on the firing line for teams requiring them.

(9) An assistant range officer will be assigned for each team to enforce safety regulations and supervise the scoring.

TABLE 5-1: COURSE OF FIRE—THE PRESIDENT'S PISTOL MATCH

Stage	Distance (yards)	Type of fire	Firing position	Number of shots	Time limit	Scoring
First	50	Slow	Standing	2 strings of 10 shots each.	10 minutes per string.	After each string.
Second	25	Timed	do	2 strings of 5 shots each.	20 seconds per string.	After 1 or 2 strings as announced by the match director.
Third	25	Rapid	do	do	10 seconds per string.	After 1 or 2 strings as announced by the match director.

TABLE 5-2: COURSE OF FIRE—NATIONAL MATCH PISTOL COURSE

Stage	Distance (yards)	Type of fire	Firing position	Number of shots	Time limit	Scoring
First	50	Slow	Standing	10	10 minutes	After 10 shots.
Second	25	Timed	do	2 strings, 5 shots each.	20 seconds per string.	After 1 or 2 strings, as announced by the Match Director.
Third	25	Rapid	do	do	10 seconds per string.	After 1 or 2 strings, as announced by the Match Director.

TABLE 5-3: COURSE OF FIRE—THE PRESIDENT'S RIFLE MATCH

Stage	Distance (yards)	Type of fire	Firing position	Number of shots	Time limit
First	200	Slow	Standing	10	10 minutes.
Second	300	Rapid	Prone from standing	10	70 seconds.
Third	600	Slow	Prone	10	10 minutes.

TABLE 5-4: COURSE OF FIRE, COURSE A—NATIONAL MATCH RIFLE COURSE

Stage	Distance (yards)	Type of fire	Firing position	Number of shots	Time limit
First	200	Slow	Standing	10	10 minutes.
Second	200	Rapid	Sitting or kneeling from standing.	10	60 seconds.
Third	300	do	Prone from standing	10	70 seconds.
Fourth [1]	600	Slow	Prone	20	20 minutes.

[1] The DCM may authorize the fourth stage to be fired at 500 yards for EIC matches other than the National Trophy Matches.

TABLE 5-5: COURSE OF FIRE, COURSE B—COMPETITIVE RIFLE COURSE, M-16 RIFLE ONLY

Stage	Distance (yards or meters)	Type of fire	Firing position	Number of shots	Time limit
First	200	Rapid fire	Rapid fire—sitting from standing.	Rapid fire—10 shots.	Rapid fire—50 seconds.
Second	200	Rapid	Kneeling from standing	10	50 seconds.
Third	200	Slow	Standing	10	10 minutes.
Fourth	300	do	Prone	10	Do.
Fifth	300	Rapid	Prone from standing	10	50 seconds.

TABLE 5-6: COURSE OF FIRE—NATIONAL TROPHY INFANTRY TEAM MATCH

Stage	Distance (yards)	Firing position	Time limit (seconds)
First	600	Prone	50
Second	500	Prone, sitting, or kneeling.	50
Third	300	Sitting or kneeling	50
Fourth	200	Standing	50

Subpart F—Awards

§ 544.80 General.

(a) *All EIC matches.* The providing of awards that are prescribed and earned always depends on whether funds are available.

(b) *National Trophy Matches.* (1) Awards for the National Trophy Matches will normally be given at the time and place of the National Matches.

(i) Permanent trophies will remain in the DCM's custody. They will be engraved with the names of the winners.

(ii) Winners will be awarded plaques or miniatures of the trophies. These plaques and miniatures will be engraved at the DCM's expense and according to the DCM's instructions.

(iii) In certain matches, categories, or award groups, a Secretary of the Army Trophy Firearm award will be given to the highest scoring competitor who has never received this award before. No competitor may receive more than one of these awards for a match. This award is subject to restrictions of law.

(iv) Further match awards may be authorized from time to time. Such awards and the conditions for receiving them will be published in the Match Program or in the Match Director's Bulletins.

(2) Correspondence concerning awards for the National Trophy Matches will be addressed to the Director of Civilian Marksmanship, Office of the Secretary of the Army, HQDA(SFDM), Washington, DC 20314–0100.

§ 544.81 Participation requirements for certain National Trophy Match awards.

In certain National Trophy Matches, awards are given for a named category or special awards group (such as Navy, Women, Infantry, Junior, or Police). These awards will be given only if the required number of competitors from the category or award group fire in the match. The required number are listed below.

(a) *Individual matches.* (1) Winner: At least 5 firers.

(2) Second place: At least 8 firers.

(3) Third place: At least 12 firers.

(b) Team matches.

(1) Winner: At least 3 teams.

(2) Second place: At least 5 teams.

(3) Third place: At least 7 teams.

§ 544.82 Awards for the President's Pistol Match.

(a) The match winner will be awarded the President's Trophy Plaque, a congratulatory letter from the President of the United States, and a President's Hundred Metallic Brassard.

(b) The match winner may also be awarded a Secretary of the Army Trophy Firearm if the requirements in paragraph 6–1b(1)(c) are met.

(c) The highest scoring 15 percent of all competitors who fire in the match will be designated "The President's Hundred." They will be awarded a "President's Hundred" metallic brassard. Not more than 100 of these awards will be given.

§ 544.83 Awards for the National Trophy Individual Pistol Match.

(a) The match winner will be awarded the Custer Trophy Plaque and a gold medal.

(b) The highest scoring Reserve competitor will be awarded the U.S. Army Reserve Memorial Trophy Plaque.

(c) The highest scoring National Guard competitor will be awarded the National Guard Association Trophy Plaque.

(d) The highest scoring Service Academy and ROTC competitor will be awarded the Intercollegiate Trophy Plaque.

(e) The highest scoring Police competitor will be awarded the Ancient Archer Trophy Plaque.

(f) The highest scoring Civilian competitor will be awarded the Silver Bowl Trophy Plaque.

(g) The highest scoring Junior competitor and Women competitor will be awarded a trophy plaque. These plaques will be named at a later date.

(h) Per paragraph 6–1b(1)(c), a Secretary of the Army Trophy Firearm award may be awarded to the highest scoring competitor in—

(1) The match (match winner).

(2) Each of the Regular Service, Reserve, National Guard, Service Academy and ROTC, Police, Civilian, Junior, and Women competitor categories (if not the match winner).

§ 544.84 Awards for the National Trophy Pistol Team Match.

Listed below are the trophy awards following the type of category. Also listed are what second and third place teams and designated competitors will receive.

(a) *Winning team awards*—The Gold Cup Trophy.

(1) The winning team will be awarded Gold Cup Trophy Plaques and gold metals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(b) *Reserve Components awards*—The U.S. Coast Guard Memoral Trophy.

(1) The highest scoring Reserve Component team will be awarded U.S. Coast Guard Memoral Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bonze medals.

(c) *Service Academy and ROTC awards*—The Alden Partridge Trophy.

(1) The highest scoring Service Academy and ROTC team will be awarded Alden Partridge Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(d) *Police awards*—The American Indian Trophy.

(1) The highest scoring Police team will be awarded American Indian Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(e) *Civilian awards*—The Oglethorpe Trophy.

(1) The highest scoring Civilian team will be awarded Oglethorpe Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(f) *Junior awards*—(trophy to be named).

(1) The highest scoring Junior team will be awarded trophy plaques (to be named at a later date) and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(g) *Awards for highest scoring competitors.* (1) The highest scoring competitor will be awarded the Military Police Corps Trophy Plaque.

(2) The highest scoring Army competitor (Regular, Reserve, or Army National Guard) will be awarded the General Mellon Trophy Plaque.

(3) The highest scoring Air Force competitor (Regular, Reserve or Air National Guard) will be awarded the General Carl Spaatz Trophy Plaque.

(h) *Awards for the National Civilian Pistol Team.* The National Civilian Pistol Team will be awarded Elihu Root gold medals. This team will consist of the four highest scoring individual Civilian competitors in this match and the coach and captain of the highest scoring Civilian team.

§ 544.85 Additional National Trophy Pistol Match awards.

The competitors with the highest aggregate score in the National Trophy Individual Pistol Match and the National Trophy Pistol Team Match will receive the following awards:

(a) The Regular Army competitor be awarded the FORSCOM Pistol Trophy Plaque.

(b) The Navy competitor (Regular or Reserve) will be awarded the Fleet Admiral Nimitz Trophy.

(c) The Marine competitor (Regular or Reserve) will be awarded the McMillan Trophy Plaque.

(d) The Civilian competitor will be awarded the Anheuser-Busch Trophy Miniature.

§ 544.86 Awards for the President's Rifle Match.

(a) The match winner will be awarded a President's Trophy Plaque, a congratulatory letter from the President of the United States, and a President's Hundred Metallic Brassard.

(b) The match winner may also be awarded a Secretary of the Army Trophy Firearm, subject to the conditions in § 544.80(b)(1)(iii).

(c) The highest scoring 15 percent of all competitors who fire in the match will be awarded the "President's Hundred" metallic brassard. This group will be designated "The President's Hundred." Not more than 100 of these awards will be given.

§ 544.87 Awards for the National Trophy Individual Rifle Match.

The following awards are for Course A.

(a) The match winner will be awarded the Daniel Boone Trophy Plaque and a gold medal.

(b) The second place winner will be awarded a silver medal.

(c) The third place winner will be awarded a bronze medal.

(d) The highest scoring Reserve competitor will be awarded the Citizen Soldier Trophy Plaque.

(e) The highest scoring National Guard competitor will be awarded the National Guard Association Trophy Plaque.

(f) The highest scoring Service Academy and ROTC competitor will be awarded the Hearst Rifle Trophy Plaque.

(g) The highest scoring Police competitor will be awarded a trophy plaque to be named later.

(h) The highest scoring Civilian competitor will be awarded the Nathan Hale Trophy Plaque.

(i) The highest scoring Junior competitor will be awarded the Golden Eagle Trophy Plaque.

(j) The highest scoring Woman competitor will be awarded a trophy plaque to be named later.

(k) The highest scoring Army competitor (Regular, Reserve, or National Guard) will be awarded the Association of the United States Army Trophy Plaque.

(l) The highest scoring Marine competitor (Regular or Reserve) will be awarded the Coast Artillery Trophy Plaque.

(m) The highest scoring Air Force competitor (Regular, Reserve, or National Guard) will be awarded the Lieutenant Paul J. Roberts, Jr. Memorial Trophy Plaque.

(n) The highest scoring Infantry competitor (Regular Army, Army Reserve, or Army National Guard) will be awarded the 25th Infantry Division Trophy Plaque.

(o) Per § 544.80(b)(1)(iii), a Secretary of the Army Trophy Firearm may be awarded to—

(1) The match winner.

(2) The highest scoring competitor in each of the Regular Service, Reserve, National Guard, Service Academy and ROTC, Police, Civilian, Junior, and Women categories.

§ 544.88 Awards for the National Trophy Rifle Team Match.

Listed below are the trophy awards following the type of category. Also listed are what second and third place teams and designated competitors will receive.

(a) *Awards for the winning team*—The National Trophy.

(1) The winning team will be awarded National Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(b) *Reserve Component awards*—The Hilton Trophy.

(1) The highest scoring Reserve Component team will be awarded Hilton Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(c) *Service Academy and ROTC awards.* (1) The highest scoring Service Academy and ROTC team will be awarded NBPRP Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(d) *Civilian awards*—The Soldier of Marathon Trophy.

(1) The highest scoring Civilian team will be awarded Soldier of Marathon Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(e) *Junior awards*—The Minuteman Trophy.

(1) The highest scoring team Junior team will be awarded Minuteman Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(f) *Awards for highest scoring individual competitors.*

(1) The highest scoring competitor will be awarded the Pershing Trophy Plaque.

(2) The highest scoring Army competitor (Regular, Reserve, or National Guard) will be awarded the Rattlesnake Trophy Plaque.

(3) The highest scoring Air Force competitor (Regular, Reserve, or National Guard) will be awarded the General Thomas D. White Trophy Plaque.

(g) *Awards for the National Civilian Rifle Team.* The National Civilian Rifle Team will be awarded Elihu Root gold medals. This team will consist of the six highest scoring individual Civilian competitors and the coach and captain of the highest scoring Civilian team.

§ 544.89 Additional National Trophy Rifle Match awards.

The competitors with the highest aggregate score in the National Trophy Individual Rifle Match and the National Trophy Rifle Team Match will receive the following awards:

(a) The Regular Army competitor will be awarded the FORSCOM Rifle Trophy Plaque.

(b) The Navy competitor (Regular or Reserve) will be awarded the Admiral Arleigh A. Burke Trophy Plaque.

(c) The Marine competitor (Regular or Reserve) will be awarded the General Shepherd Trophy Plaque.

(d) The Civilian competitor will be awarded the Pietroforte Trophy Plaque.

§ 544.90 Awards for the National Trophy Infantry Team Match.

Listed below are the trophy awards following the type of category. Also listed are what second and third place teams and designated competitors will receive.

(a) *Winning team awards*—The Infantry Trophy.

(1) The winning team will be awarded Infantry Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(b) *Reserve Components awards*—The Celtic Chieftain Trophy.

(1) The highest scoring Reserve Component team will be awarded Celtic Chieftain Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(c) *Civilian awards*—The Leatherneck Trophy.

(1) The highest scoring Civilian team will be awarded Leatherneck Trophy Plaques and gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

(d) *Junior awards*—Junior Infantry Team Trophy.

(1) The highest scoring Junior team will be awarded gold medals.

(2) The second place team will be awarded silver medals.

(3) The third place team will be awarded bronze medals.

§ 544.91 Special medals in National Trophy Individual Pistol and Rifle Matches.

(a) The highest 10 percent of Civilians who fire in the National Trophy Individual Pistol or National Trophy Individual Rifle Match, but who do not receive match awards or the place medals prescribed in § 544.93, will be given bronze medals. The medal for the pistol match will depict the Silver Bowl Trophy and the medal for the rifle match will depict the Nathan Hale Trophy.

(b) The highest 10 percent of Juniors who fire in the National Trophy Individual Pistol or National Trophy Individual Rifle Match, but who do not receive match awards or the place medals prescribed in § 544.93 will be given bronze medals.

§ 544.92 Place medals in National Trophy team matches.

Place medals will be given to the captain, coach, and firing members of the highest 15 percent of all teams firing in the match. Medals will be given as follows:

(a) The winning team will be awarded gold medals.

(b) The second place team will be awarded silver medals.

(c) The third place team will be awarded bronze medals.

(d) The remainder of the 15 percent will be awarded bronze medals.

§ 544.93 Place medals in individual EIC matches.

(a) For the EIC matches listed in paragraph 6–15, place medals will be awarded to the highest scoring 10 percent of all non-Distinguished competitors competing in the match. These medals will be awarded as follows:

(1) The highest one-sixth of the 10 percent will be gold.

(2) The next highest one-third of the 10 percent will be silver.

(3) The remainder of the 10 percent will be bronze.

(b) Competitors who have attained or are qualified for Distinguished designation with the arm concerned will be ranked among the non-Distinguished competitors according to score. Each will be awarded a medal of the same type (gold, silver or bronze) as the non-Distinguished competitor next below him or her.

§ 544.94 Distinguished designation and badge awards.

(a) Competitions in which credits toward Distinguished designation may be earned and for which EIC badges may be awarded are—

(1) The National Trophy Individual Pistol and National Trophy Individual Rifle Matches.

(2) Certain Service matches not open to civilians.

(3) NRA Regional and State Championships.

(b) For credits earned in an EIC match to be recognized, the match must—

(1) Conform to all parts of this regulation that apply.

(2) Include at least 10 non-Distinguished competitors eligible according to this regulation.

(3) Be completed.

(c) The following rules apply to Civilian competitors competing for the Distinguished Designation and Badge award:

(1) In any calendar year, these competitors may compete in not more than four EIC matches for pistol and not more than four for rifle. The matches they may enter are listed below.

(i) The National Trophy Individual Match.

(ii) NRA Regional or State championships. Civilian competitors may not compete in more than three NRA Regional or State championship EIC matches a year.

(iii) A Service-sponsored match. If entry in such a match is possible, the match will constitute as one of the three matches authorized in (b) of this section.

(2) The DCM will award credit points toward Distinguished designation to competitors who earn place medals according to paragraph 6–14a. Points will be awarded as listed below.

(i) For any place medal in a National Trophy Individual Rifle Match, 10 points will be awarded. These points will be awarded to civilians only.

(ii) For place medals in other EIC matches listed in (c)(1) of this section, 10 points will be awarded for gold medals, 8 points will be awarded for silver medals, and 6 points will be awarded for bronze medals.

(3) The DCM will award the Distinguished Badge when a competitor has earned 30 or more credit points with the arm concerned.

(d) Competitors in the Regular Service, Reserve, National Guard, and Service Academy categories can earn credits toward the Distinguished designation and will be awarded the appropriate badges according to the regulations of their Service.

§ 544.95 EIC badges.

(a) The DCM will award a bronze EIC badge to Civilian competitors when they first earn credit points toward the Distinguished designation. They must earn their points according to paragraph 6–15. The DCM will award a silver EIC badge to these competitors when they have earned a total of 20 or more credit points.

(b) Competitors in the Regular Service, Reserve, National Guard, and Service Academy categories will be awarded EIC badges according to the regulations of their Service.

§ 544.96 Marksmanship qualification awards.

(a) The DCM will award the Basic Marksmanship Qualification Badge to ROTC, Police, Civilian, and Junior competitors who fire qualifying scores in the National Trophy Individual Pistol or

Rifle Matches. The badge will show qualification as Expert, Sharpshooter, or Marksman. The DCM may also award, separately or along with the badge, a bar that will show whether a rifle or pistol was used. Qualifying scores for these awards are listed below.

(1) Pistol awards—possible 300 points.
(i) Pistol Expert—270 points.
(ii) Pistol Sharpshooter—240 points.
(iii) Pistol Marksman—210 points.
(2) Rifle awards—possible 500 points.
(i) Expert Rifleman—450 points.
(ii) Rifle Sharpshooter—400 points.
(iii) Rifle Marksman—350 points.

(b) The DCM will present these awards after the close of the matches.

§ 544.97 Scores allowed for club qualification firing.

To meet the requirements in AR 920–20 on clubs' yearly qualification firing, clubs enrolled by the DCM may count their members' scores from the National Matches and/or EIC matches (§ 544.94).

Appendix A—Related Publications

Approved courses of fire for civilian marksmanship training for clubs and schools enrolled with the DCM (These courses are available from HQDA(SADM). WASH DC 20314.)

AR 5–9 (Intraservice Support Installation Area Coordination)
AR 140–125 (Marksmanship Training and Competitive Program)
AR 145–1 (Senior ROTC Program: Organization, Administration, and Training)
AR 145–2 (Junior Program and National Defense Cadet Corps: Organization, Administration, Operations, and Support)
AR 350–6 (Army-Wide Small Arms Competitive Marksmanship)
AR 600–20 (Army Command Policy and Procedures)
AR 600–23 (Nondiscrimination in Federally Assisted Programs)
AR 622–10 (Competition in Small Arms)
AR 672–5–1 (Military Awards)
AR 700–131 (Loan of Army Materiel)
AR 725–1 (Special Authorization and Procedures for Issues, Sales and Loans)
AR 735–5 (Basic Policy and Procedures for Policy Accounting)
AR 735–11 (Accounting for Lost, Damaged and Destroyed Property)
AR 920–15 (National Board for the Promotion of Rifle Practice and Office of Director of Civilian Marksmanship)
AR 920–20 (Promotion of Practice with Rifled Arms)
AR 920–25 (Rifles M14M and M14NM, for Civilian Marksmanship Use)
AR 920–35 (National Match Fund)
DODD 1025.1 (DOD Civilian Rifle and Pistol Marksmanship Training Program) (This DODD can be obtained from HQDA(SADM), WASH DC 20314 0100)

NRA Official Rule Books for Pistol and Highpower Rifle (These books can be obtained from the National Rifle Association, 1600 Rhode Island Avenue, NW., Washington, DC 20036).

Appendix B—Trophies of the National Board for the Promotion of Rifle Practice

B–1. The President's Pistol Trophy

This trophy was purchased by the NBPRP in 1981. It consists of a disc of white New England marble on a hardwood base. The Presidential Seal is carved, gilded, and mounted on the disc. This trophy is awarded to the winner of the President's Pistol Match.

B–2. The General Custer Trophy

The General Custer Trophy was purchased by the NBPRP in 1926. It is a bronze statuette of General George Armstrong Custer (1828–1876) firing a pistol. The trophy is awarded to the winner of the National Trophy Individual Pistol Match.

B–3. The US Army Reserve Memorial Trophy

The US Army Reserve Memorial Trophy was donated to the NBPRP by the US Army Reserve in 1969. The trophy depicts the citizen soldier leaving his civilian occupation to take up arms in defense of his country, and is in memory of those who have given their lives in this duty. It is awarded to the highest scoring Reserve competitor in the National Trophy Individual Pistol Match.

B–4. The National Guard Association Trophy (Pistol)

The National Guard Association Trophy (Pistol) was presented to the NBPRP in 1983, replacing the original trophy that was established in 1979. The trophy depicts a helmeted Guardsman in bronze, mounted on a two-tiered walnut base. This trophy is awarded to the highest scoring National Guard competitor in the National Trophy Individual Pistol Match.

B–5. The Intercollegiate Trophy

The Intercollegiate Trophy was purchased by the NBPRP in 1958. The trophy is a sterling silver urn, depicting a battle scene in what is believed to be the war between the Romans and Celts in A.D. 43–44. It is awarded to the highest scoring Service Academy or ROTC competitor in the National Trophy Individual Pistol Match.

B–6. The Ancient Archer Trophy

The Ancient Archer Trophy was purchased by the NBPRP in 1962. The trophy is made of bronze and depicts an ancient archer stringing his bow. It is awarded to the highest scoring Police competitor in the National Trophy Individual Pistol Match.

B–7. The Silver Bowl Trophy

The Silver Bowl Trophy was designed and purchased by the NRA in 1956 and presented to the NBPRP for award that year. It is a large, sterling silver bowl, embossed on the rim and pedestal with floral leaf design. It is awarded to the highest scoring Civilian competitor in the National Trophy Individual Pistol Match.

B–8. The Gold Cup Trophy

The Gold Cup Trophy was presented to General John J. Pershing by the Minister of War of the Republic of China as the award for first place in the pistol shooting match among the Allies at Le Mans, France in 1919. It was won by the American Expeditionary Force (AEF) Pistol Team. The team then presented it for annual competition in the National Trophy Pistol Team Match. The trophy is a helmet-shaped gold cup, engraved and mounted on an ebony base. The Gold Cup Trophy is awarded to the winning team in the National Trophy Pistol Team Match.

B–9. The US Coast Guard Memorial Trophy

The U.S. Coast Guard Memorial Trophy was presented to the NBPRP in 1957 by the Coast Guard. This trophy commemorates Coast Guard personnel who lost their lives while in that Service. It is a replica of the Coast Guard Memorial located in Arlington Cemetery, with statuettes of Coast Guard personnel holding service pistols on either side of the central pyramid. The central pyramid is cast in bronze and heavily plated in silver with an oxidized finish. It is awarded to the highest scoring Reserve Component team in the National Trophy Pistol Team Match.

B–10. The Alden Partridge Trophy

The Alden Partridge Trophy was presented to the NBPRP in 1971 by the president of Norwich University, Northfield, Vermont. The trophy is a bronze bust of General Alden Partridge, founder and first president of Norwich University. This university was the first institution of higher learning to include military training as a part of its curriculum and is credited as the founding school of what is now known as the ROTC program. This trophy is awarded to the highest scoring Service Academy or ROTC team in the National Trophy Pistol Team Match.

B–11. The American Indian Trophy

The trophy was donated to the NBPRP in 1962 by the YMCA of Greenwich, Connecticut. It is a bronze of Sinte Maza, "Iron Tail," an Oglala Sioux Indian. It is awarded to the highest scoring Police team in the National Pistol Team Match.

B–12. The Oglethorpe Trophy

The Oglethorpe Trophy was presented to the NBPRP in 1962 by the River Bend Rifle and Gun Club of Atlanta. The trophy is a sterling silver bowl mounted on a walnut base and was named in honor of the founder and first Governor of Georgia, James Oglethorpe. The trophy is awarded to the highest scoring Civilian team in the National Trophy Pistol Team Match.

B–13. The Military Police Corps Pistol Trophy

The Military Police Corps Trophy was presented to the NBPRP in 1956 through private subscription among the officers and enlisted members of the Military Police Corps. This trophy is a specially designed bronze relief depicting the worldwide mission of the Military Police Corps. Crossed pistols are mounted at the apex of the trophy and are exact duplicates of the original pistols used in the design of the Corps insignia. The trophy is awarded to the highest scoring competitor in the National Trophy Pistol Team Match.

B–14. The General Mellon Trophy

The General Mellon Trophy was presented to the NBPRP in 1958 by General Richard K. Mellon, Deputy Adjutant General, Commonwealth of Pennsylvania. The Mellon Trophy is a miniature of a giant Kodiak bear in an upright and alert pose. This trophy is awarded to the highest scoring Army Competitor (Regular or Reserve) in the National Trophy Pistol Team Match.

B–15. The General Carl Spaatz Trohpy

This trophy was presented to the NBPRP in 1961 by the US Air Force in honor of General Carl Spaatz, Chief of Staff of the Air Force from 1947 to 1948. It is a large silver globe mounted on an ebony base and surrounded by four silver eagles. This trophy is awarded to the highest scoring Air Force competitor (Regular, Reserve, or Air National Guard) in the National Trophy Pistol Team Match.

B–16. The US Army Forces Command Pistol Trophy

The US Army Forces Command Pistol Trophy was presented to the NBPRP by the Commanding General, US Army Forces Command. The mounted brace of pistols are circa 1900 Colt Army special caliber .38 revolvers. The trophy was designed and constructed by artisans of Rock Island Arsenal and is awarded to the Regular Army competitor making the highest aggregate score in the National Individual Pistol Match and National Trophy Pistol Team Match.

B–17. The Fleet Admiral Nimitz Trophy

The Fleet Admiral Nimitz Trophy was presented to the NBPRP in 1978 by the US Navy through private subscription among the officers and enlisted members of the Navy and Naval Reserve. The trophy is the pistol presented to Fleet Admiral Chester W. Nimitz in 1921 by his classmates at the US Naval Academy. It is awarded to the Navy competitor (Regular or Reserve) making the highest aggregate score in the National Trophy Individual Pistol Match and National Trophy Pistol Team Match.

B–18. The McMillan Trophy

The McMillan Trophy was presented by the US Marine Corps to the NBPRP in 1978 for award in the Service pistol competitions sponsored by the NBPRP. The trophy honors Lieutenant Colonel William W. McMillan, an outstanding Marine Corps shooter for over 20 years. It is awarded to the Marine competitor (Regular or Reserve) making the highest aggregate score in the National Trophy Individual Pistol Match and National Trophy Pistol Team Match.

B–19. The Anheuser-Busch Trophy

This trophy is a sterling silver bowl, emblazoned with the Anheuser-Busch eagle and mounted on a hardwood base. It is awarded to the Civilian competitor making the highest aggregate score in the National Trophy Individual Pistol Match and the National Trophy Pistol Team Match.

B–20. The President's Rifle Trophy

This trophy was purchased by the NBPRP in 1977. It consists of a disc of black New England slate mounted on a hardwood base. On the disc, the Presidential Seal is carved and gilded. The President's Trophy is awarded to the winner of the President's Rifle Match.

B–21. The Daniel Boone Trophy

The Daniel Boone Trophy was purchased by the NBPRP in 1925. The trophy is a bronze statue of the marksman Daniel Boone, American pioneer in Kentucky and Missouri (1734–1820), with his rifle. The trophy is awarded to the winner of the National Trophy Individual Rifle Match.

B–22. The Citizen Soldier Trophy

The Citizen Soldier Trophy was presented to the NBPRP in 1964 by the Reserve Officers' Association of the United States. The trophy is flanked by miniature replicas of the Liberty Bell. Affixed to the front of the trophy, encompassing a large Reserve Officers' Association seal, are the five insignia of the Armed Services. The trophy is awarded to the highest scoring Reserve competitor in the National Trophy Individual Rifle Match.

B–23. The Hearst Rifle Trophy

The present Hearst Rifle Trophy was donated by William Randolph Hearst to the National Matches in 1940. The Hearst Rifle Trophy is a 17th century Spanish flintlock carbine in blunderbuss style, inlaid with ivory and mother of pearl and having a chased lock. This trophy is awarded to the highest scoring Service Academy or ROTC competitor in the National Trophy Individual Rifle Match.

B–24. The Nathan Hale Trophy

The Nathan Hale Trophy was presented to the NBPRP by the NRA in 1956. It is a bronze figure created in 1890, of the Revolutionary War hero, Captain Nathan Hale. It is awarded to the highest scoring Civilian in the National Trophy Individual Rifle Match.

B–25. The Golder Eagle Trophy

The Golder Eagle Trophy was purchased by the NBPRP in 1963. The trophy is a golden eagle, ascending, with wings elevated and displayed. The eagle is mounted on a walnut base. The trophy is awarded to the highest scoring Junior competitor in the National Trophy Individual Rifle Match.

B–26. The Association of the United States Army Trophy

The Association of the US Army Trophy was presented to the NRPRP in 1962 by the Association of the United States Army. The trophy is a 16-inch bronze statuette of a US Army soldier mounted on a wooden base. The trophy is awarded to the highest scoring Army competitor (Regular, Reserve, or National Guard) in the National Trophy Individual Rifle Match.

B–27. The Coast Artillery Trophy

The Coast Artillery Trophy was presented to the NBPRP by the Commandant, United States Marine Corps, in 1961. The trophy is a sterling silver cup wth figures of Marines in standing and kneeling positions firing a rifle. In 1923, officers and enlisted members of the Coast Artillery Corps presented the trophy to the Marine Corps in appreciation of the Marine Corps Team training the Coast Artillery Team for the National Matches. (This training was from 1910 to 1922.) This trophy is awarded to the highest soring Marine competitor (Regular or Reserve) in the National Trophy Individual Rifle Match.

B–28. The Lieutenant Paul J. Roberts, Jr., Memorial Trophy

The Lieutenant Paul J. Roberts, Jr., Memorial Trophy was presented to the NBPRP in 1958. It is a sterling silver globe, designated by the US Air Force as a memorial to Lieutenant Paul J. Roberts, Jr., a fighter pilot who was killed during combat in World War II in Germany. The trophy was presented to the NBPRP by his father. It is awarded to the highest scoring Air Force competitor (Regular, Reserve, or National Guard) in the National Trophy Individual Rifle Match.

B–29. The 25th Infantry Division Trophy

The 25th Infantry Division Trophy was presented to the NBPRP in 1955 by the 25th Infantry Division Association. It illustrates the World War II area in which the division saw combat and lists the campaigns in which the division participated. This trophy is awarded to the highest scoring Infantry competitor (Regular Army, Army Reserve, or Army National Guard) in the National Trophy Individual Rifle Match.

B–30. The National Trophy

The National Trophy was provided by Congress in 1903 in the law that established the National Matches. Commonly referred to as the "Dogs of War Trophy," it is a bronze plaque depicting a warrior of ancient times with four dogs of war on a leash. The trophy is awarded to the winning team in the National Trophy Rifle Team Match.

B–31. The Hilton Trophy

The Hilton Trophy was presented to the NRA by the Honorable Henry Hilton of New York in 1878, and the NRA presented the trophy to the NBPRP in 1903. The silver-plated bronze plaque depicts an Indian buffalo hunt. Also on the plaque are figures of eagles, oak boughs, and war trophies. It is awarded to the highest scoring Reserve Component team in the National Trophy Rifle Team Match.

B–32. The Soldier of Marathon Trophy

The Soldier of Marathon Trophy is the oldest NBPRP trophy. It has been in shooting competitions since 1875. The NRA presented the trophy to the US Government for competition in the National Trophy Rifle Team Match in 1903. The trophy is a bronze figure of the runner, Thidipedes, who, though exhausted and fallen to a reclining position, still holds high the torch he is carrying to announce the Greek victory at Marathon. The trophy is now awarded to the highest scoring Civilian team in the National Trophy Rifle Team Match.

B–33. The Minuteman Trophy

The Munuteman Trophy was placed in competition in 1925. The trophy is a bronze statuette of the "Minuteman of Concord." (The original life-sized monument stands in Concord, Massachusetts.) The trophy is

awarded to the highest scoring Junior team in the National Trophy Rifle Team Match.

B–34. The Pershing Trophy

The Pershing Trophy was presented by General John J. Pershing (1860–1948), Commander of the AEF of World War I, for team competition at the Inter-Allied Games in Paris in 1919. Won by the AEF, it was brought to the United States and placed in the custody of the NBPRP with General Pershing's concurrence. The trophy is a bronze figure of a World War I soldier firing the service pistol. It is awarded to the highest scoring individual competitor in the National Trophy Rifle Team Match.

B–35. The Rattlesnake Trophy

The Rattlesnake Trophy was purchased by the NBPRP in 1938. This statuette depicts a cowboy and his horse at the moment a rattlesnake strikes at the horse's front feet. It is awarded to the highest scoring Army competitor (Regular, Reserve, or National Guard) in the National Trophy Rifle Team Match.

B–36. The General Thomas D. White Trophy

The General Thomas D. White Trophy was presented to the NBPRP in 1960 by the US Air Force in honor of General Thomas D. White, Chief of Staff of the Air Force from 1957 to 1961. The trophy is a large silver bowl mounted on an ebony base. It is awarded to the highest scoring Air Force competitor (Regular, Reserve, or National Guard) in the National Trophy Rifle Team Match.

B–37. The US Army Forces Command Rifle Trophy

The US Army Forces Command Rifle Trophy was presented to the NBPRP by the Commanding General, US Army Forces Command. The mounted rifles are circa 1900 Winchester low wall muskets, caliber .22 short, with consecutive serial numbers, the highest of which was the last musket chambered for the .22 short cartridge. The trophy was designed and constructed by artisans of Rock Island Arsenal for award to the Regular Army competitor making the highest aggregate score in the National Trophy Individual Rifle Match and National Trophy Rifle Team Match.

B–38. The Admiral Arleigh A. Burke Trophy

The Admiral Arleigh A. Burke Trophy was presented to the NBPRP by the US Navy through private subscription among the officers and enlisted members of the Navy and Navy Reserve. The trophy is the steel helmet worn by Admiral Burke through the entire Atlantic Campaign of World War II. The trophy is awarded to the Navy competitor (Regular or Reserve) making the highest aggregate score in the National Trophy Individual Rifle Match and the National Trophy Rifle Team Match.

B–39. The General Shepherd Trophy

The General Shepherd Trophy was presented to the NBPRP in 1956 by General Lemuel C. Shepherd, Jr., Commandant of the Marine Corps from 1952 to 1956. The trophy is a bronze replica of the Marine Corps War Memorial depicting the flag-raising on Mount Suribachi during the battle of Iwo Jima in World War II. This trophy is awarded to the Marine competitor (Regular or Reserve) making the highest aggregate score in the National Trophy Individual Rifle Match and the National Trophy Rifle Team Match.

B–40. The Pietroforte Trophy

The Pietroforte Trophy was donated to the NBPRP by private subscription among members of the US Marine Corps Distinguished Shooters' Association. This trophy honors Warrant Officer Michael Pietroforte, who distinguished himself as one of the finest marksmen in Marine Corps history during his 30 years of service. It is awarded to the Civilian competitor making the highest aggregate score in the National Trophy Individual Rifle Match and the National Trophy Rifle Team Match.

B–41. The Infantry Trophy

The Infantry Trophy was presented to the NRA in 1922 by the US Army Infantry through private subscription among its members (officer and enlisted and Regular, Reserve, and National Guard). The NRA placed the trophy in the custody of the NBPRP in 1936. This trophy depicts the combat Infantryman in action and is awarded to the winning team in the National Trophy Infantry Team Match.

B–42. The Celtic Chieftain Trophy

The Celtic Chieftain Trophy was purchased by the NBPRP in 1958. The statute represents a bronze figure of Caractacus, British chieftain of the tribe of Cateveillauni, who led the native resistance against the Roman, Aulus Plautus (A.D. 43–47). This trophy is awarded to the highest scoring Reserve Component team in the National Trophy Infantry Team Match.

B–43. The Leatherneck Trophy

In 1957, the Marine Corps presented this trophy to the NBPRP in the name of the officers and enlisted members of the Marine Corps. The Leatherneck Trophy is a replica of the life-size "Iron Mike" statue that has stood at the Quantico Marine Corps Base, Virginia, since 1921. It is awarded to the highest scoring Civilian team in the National Trophy Infantry Team Match.

B–44. The Women's Rifle Trophy

This trophy was authorized by the NBPRP in 1983 and first presented in 1984. It consists of a pair of Winchester Low Wall, single shot, caliber .22 muskets mounted on a polished hardwood base. This trophy is awarded to the highest scoring Woman competitor in the National Trophy Individual Rifle Match.

B–45. The Women's Pistol Trophy

This trophy was authorized by the NBPRP in 1983 and first presented in 1984. It consists of two Colt Army Special caliber .38 revolvers mounted on a polished hardwood base. This trophy is awarded to the highest scoring Woman competitor in the National Trophy Individual Pistol Match.

B–46. The Police Rifle Trophy

This trophy was authorized by the NBPRP in 1983 and first presented in 1984. It consists of three Springfield M1903 rifles mounted on a polished hardwood base. This trophy is awarded to the highest scoring Police competitor in the National Trophy Individual Rifle Match.

B–47. The Junior Pistol Team Trophy

This trophy was authorized by the NBPRP in 1983 and first presented in 1984. It consists of four caliber .45 pistol facsimilies mounted on a polished hardwood base. This trophy is awarded to the highest scoring Junior team in the National Trophy Pistol Team Match.

B–48. The Junior Pistol Trophy

This trophy was authorized by the NBPRP in 1983 and first presented in 1984. It consists of two Colt Ace caliber .22 pistols mounted on a polished hardwood base. The trophy is awarded to the highest scoring Junior competitor in the National Trophy Individual Pistol Match.

B–49. The Junior Infantry Team Trophy

This trophy was recommended by the NBPRP in 1983 and first presented in 1984. It consists of three Springfield M1903 rifles mounted on a polished hardwood base. The Springfield rifles were used in the design because of their prominence in the Infantry Trophy; the fact that a distinctive award has been established to promote junior participation in a singularly military type of markmanship competition is considered most appropriate. The trophy is awarded to the highest scoring Junior team in the National Infantry Trophy Team match.

Glossary

Section I

Abbreviations

AEF—American Expeditionary Forces
AG—adjutant general
AMCCOM—US Army Armament, Munitions, and Chemical Command
CECOM—US Army Communications-Electronics Command
CG—commanding general
CMP—Civilian Marksmanship Program
CONUS—continental United States
DARCOM—US Army Material Development and Readiness Command
DCM—Director of Civilian Marksmanship
DNMIC (Ops/Svcs)—Deputy National Matches Installation Commander (Operations and Services)
EIC—excellence-in-competition
FORSCOM—US Army Forces Command
LNO—Liaison officer
MR—midrange
NBPRP—National Board of the Promotion of Rifle Practice
NGB—National Guard Bureau
NMIC—National Matches Installation Commander
NMPAO—National Matches Public Affairs Officer
NMSC—National Matches Support Coordinator
NMSD—National Matches Support Detachment
NRA—National Rifle Association
OHARNG—Ohio Army National Guard
OSO—Ordnance Safety Officer
ROTC—Reserve Officers' Training Corps
SA—Secretary of the Army
SAFS—Small Arms Firing Schools

SPT—Support
SR—short range
TRADOC—US Army Training and Doctrine Command
USC—US Code
XO, NM—Executive Officer, National Matches
XO, CMP (SPT)—Executive Officer, Civilian Marksmanship Program (Support)

Section II

Terms

Complete the Match

To fire recorded shots in all stages of a match. For team matches, this term means that all firing members fire recorded shots in all stages of the match.

Completed Match

A match in which all competitors have had the opportunity to fire in all stages of the match.

Distinguished Designation

Award of the Distinguished Pistol Shot or Distinguished Rifleman Badge. These awards are made to individuals who have earned the required number of credit points.

Excellence-in-Competition (EIC) Matches

Matches in which credit toward the Distinguished designation may be earned and EIC badges awarded.

Fire in the Match

To fire one or more recorded shots in any stage of the match. For team matches, this term means that one or more team members fire one or more recorded shots in any stage of the match.

B–50. The National Guard Association Trophy (Rifle)

The National Guard Association Trophy (Rifle) was presented to the NBPRP in 1983, replacing the original trophy that was established in 1979. The trophy depicts a helmeted Guardsman in bronze, mounted on a two-tiered walnut base. This trophy is awarded to the highest scoring National Guard competitor in the National Trophy Individual Pistol Match.

John O. Roach, II,

Army Liaison Officer with the Federal Register.

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October 11, 1984

Part III

Environmental Protection Agency

40 CFR Part 761

Polychlorinated Biphenyls (PCBs); Manufacture, Processing, Distribution in Commerce and Use Prohibitions; Use in Electrical Transformers; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 761

[OPTS 62035A; TSH FRL-2665S-1]

Polychlorinated Biphenyls (PCBs); Manufacture, Processing, Distribution in Commerce and Use Prohibitions; Use in Electrical Transformers

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA issued an Advance Notice of Proposed Rulemaking (ANPR), which was published inthe **Federal Register** of March 23, 1984 (49 FR 11070), that solicited information on the risks posed by fires involving electrical transformers containing polychlorinated biphenyls (PCBs) and on mechanisms for mitigating or eliminating these risks.

In this Proposed Rule, EPA reconsidered the determination made in the August 25, 1982 PCB Electrical Use Rule that allowed the continued use of PCBs in most transformers. EPA has revised its earlier assessment to include a consideration of the risks posed by fire-related events, the costs of cleanup following these incidents, and the cost and effectiveness of regulatory control measures for mitigating or eliminating these risks. As a result, EPA is proposing amendments to the August 1982 use authorization for the use of PCBs in electrical transformers that require: (1) The immediate registration of all PCB Transformers (transformers containing greater than 500 parts per million (ppm) (PCBs) with appropriate fire department jurisdictions, (2) the immediate marking of the exterior of PCB Transformers locations, with PCB identification labels, (3) the immediate removal of stored combustibles from PCB Transformer locations, (4) the immediate registration with building owners of all PCB Transformers located in or near buildings, (5) the installation, by July 1, 1988, of additional electrical protective devices on PCB Transformers in high secondary (low side) voltage systems which are located in or near buildings, and (6) the isolation, by July 1, 1988, of all PCB Transformers in or near buildings from building ventilation equipment, building ductwork, and openings in construction to reduce the widespread contamination of structures and the environment by smoke from a fire involving a PCB Transformer. EPA is also proposing to require owners of PCB Transformers involved in fire-related incidents to report these incidents to the National Spill Response Center prior to initiating any cleanup efforts, and, to take immediate measures to contain water releases associated with the incident.

DATES: An informal hearing, if requested, will be held on December 26, 1984, in Washington, D.C. The exact time and location of the hearing will be available by calling the TSCA Assistance Office toll free at 800–424–9065 or, in Washington, D.C., by calling 554–1404. Comments on the issues raised in this Notice and requests to participate in an informal hearing must be submitted by December 10, 1984.

ADDRESSES: Comments should be submitted in triplicate to: TSCA Public Information Office (TS–793), Office of Toxic Substances, Environmental Protection Agency, Rm. E–108, 401 M St., SW., Washington, D.C. 20460.

Comments should include the docket number OPTS–62035. Comments received in connection with this Notice will be available for reviewing and copying from 8 a.m. to 4 p.m., Monday through Friday, excluding legal holidays, in Rm. E–107, Environmental Protection Agency, 401 M St., SW., Washington, D.C.

FOR FURTHER INFORMATION CONTACT: Edward A. Klein, Director, TSCA Assistance Office (TS–799), Office of Toxic Substances, Environmental Protection Agency, Rm. E–543, 401 M St., SW., Washington, D.C. 20460, Toll free: (800–424–9065), In Washington, D.C.: (554–1404), Outside the USA: (Operator—202–554–1404).

SUPPLEMENTARY INFORMATION:

I. Background

Section 6(e) of the Toxic Substances Control Act (TSCA) generally prohibits the use of PCBs after January 1, 1978. The statute does, however, set forth two exceptions under which EPA may, by rule, allow a particular use of PCBs to continue. Under section 6(e)(2) of TSCA, EPA may allow PCBs to be used in "totally enclosed manner." A "totally enclosed manner" is defined by TSCA to be any manner which will ensure that any exposure of human beings or the environment to a polychlorinated biphenyl will be insignificant, as determined by the Administrator by rule." TSCA also allows EPA to authorize the use of PCBs in a manner other than a totally enclosed manner if the Agency finds that the use "will not present an unreasonable risk of injury to health or the environment."

EPA promulgated a rule, which was published in the **Federal Register** of May 31, 1979 (44 FR 31514), to implement section 6(e) (2) and (3) of TSCA. This rule is listed in the Code of Federal Regulations under 40 CFR Part 761. The rule, among other provisions, designated all intact, nonleaking capacitors, electromagnets, and transformers, other than railroad transformers, as "totally enclosed," thus permitting their use without specific authorizations or conditions. The Environmental Defense Fund (EDF) petitioned the U.S. Court of Appeals for the District of Columbia Circuit to review a number of provisions of the rule, including the portion of the rule that designated all intact and nonleaking capacitors, electromagnets, and transformers as "totally enclosed." (*Environmental Defense Fund, Inc.* v. *Environmental Protection Agency*. 636 F.2d 1267).

On October 30, 1980, the court, among other things, decided that there was insufficient evidence in the record to support the Agency's classification of transformers, capacitors, and electromagnets as totally enclosed. The court invalidated this portion of the rule, as well as other provisions, and remanded the rule to EPA for further action.

As a consequence of the October 1980 decision, EPA undertook a number of rulemaking actions. The rule relevant to the subject of today's proposed rule was published in the **Federal Register** of August 25, 1982 (47 FR 37342) (hereafter, PCB Electrical Use Rule). This rule amended the May 1979 rule by authorizing the continued use of PCB Transformers (electrical transformers containing greater than 500 ppm PCBs) in facilities involved in handling of food or feed items until October 1, 1985, and by authorizing the use of all other categories of non-railroad electrical transformers containing or contaminated with PCBs for the remainder of their useful lives. In its August 1982 decision, EPA made a determination that authorizing the use of these transformers for the remainder of their useful lives did not present an unreasonable risk to public health or the environment for the following reasons:

1. EPA determined that if it did not authorize the use of PCBs in transformers, the costs to the public and United States industry would be billions of dollars, primarily as a result of the disruption of electrical service. EPA determined that the resulting reduction in risk would not outweigh these substantial costs.

2. EPA determined that the inspection and maintenance programs required under the rule reasonably reduced the exposure risks associated with the use of PCBs in PCB Transformers and the servicing conditions prevented further PCB contamination of transformers.

3. EPA determined that releases of PCBs to the environment and exposure to humans and biological organisms from mineral oil transformers are minimal. EPA estimated that these transformers contain less than 0.15 percent of all the PCBs used in transformers and release less than one half of a percent of these PCBs on an annual basis.

4. EPA determined that the costs associated with other risk reduction measures such as accelerated phase-out, reducing the PCB concentration in the dielectric fluid, or providing containment for transformers were not reasonable when compared to the potential reduction in release of PCBs achieved.

In evaluating the risks posed by the continued use of electrical transformers containing PCBs for the August 1982 PCB Electrical Use Rule, EPA considered exposures resulting from leaks and spills of PCB-containing dielectric fluid as constituting the principal route of release of PCBs to the environment from this equipment.

However, fires involving transformers also could be responsible for the release of PCBs. For example, on February 5, 1981, in the Binghamton State Office Building in Binghamton, New York, a PCB Transformer was involved in a fire in the basement of the building. PCBs and oxidation products were distributed throughout the 18-story office building via two vertical ventilation shafts that ran the length of the building and opened into the transformer vault in the basement. Monitoring, completed after the fire, indicated that PCBs, polychlorinated dibenzofurans (PCDFs) (including the toxic congener 2,3,7,8-tetrachlorodibenzofuran (2,3,7,8—TCDF)), and polychlorinated dibenzodioxins (PCDDs) (including the toxic congener 2,3,7,8-tetrachlorodibenzo-p-dioxion (2,3,7,8-TCDD)) were distributed throughout the interior of the building. From laboratory studies, it appears that PCDFs are formed from both the oxidation of PCBs and the oxidation of chlorinated benzenes in combustion situations. PCDDs, however, appear to be formed only from the oxidation of chlorinated benzenes. Tri-and tetra-chlorinated benzenes often make up 30–35% of PCB askarel dielectric fluid, and can be present at low levels as contaminants in other fluids.

At the time of promulgation of the August 25, 1982 PCB Electrical Use Rules, EPA believed that fires involving transformers that contain PCBs were very rare, isolated events. Thus, although EPA made determinations that the use of electrical transformers containing PBC did not pose unreasonable risks to public health or the environment, EPA did not directly consider the public health and environmental risks posed by fire-related events. EPA also did not evaluate the cost of implementing risk reduction measures to mitigate the risks posed by fires involving this equipment or factor into its economic assessment certain now-identified costs associated with the continued use of these transformers, principally, the very high costs of cleanup following more serious incidents. These costs reduce the benefits associated with the continued use of these transformers.

After the promulgation of the PCB Electrical Use Rule, additional information came to EPA's attention that indicated that fires involving transformers that contain PCBs may occur more frequently than previously expected, and that transformer fire-related hazards are not restricted solely to transformers located inside buildings. On May 15, 1983, in the One Market Plaza complex in San Francisco, California, a PCB Transformer was involved in a smoky transformer vault fire. Monitoring completed after the fire indicated the presence of PCBs, PCDFs, and PCDDs in soot from this fire. Although the vault housing the transformer was located exterior to the building itself (in a sidewalk vault), unsealed conduits from the vault to the basement and outside air intake vents drew the contaminated smoke into the building and allowed for the distribution of these compounds into the ductwork of the building.

The San Francisco incident, and four more recent incidents, in the First National Bank Building in Chicago, Illinois, in September 1983; in Tulsa, Oklahoma, in December 1983 and May 1984; and in Miami, Florida, in May 1984, have prompted EPA to reassess its earlier position on the expected frequency of fire-related incidents involving transformers that contain PCBs.

EPA issued an Advance Notice of Proposed Rulemaking (ANPR), which was published in the **Federal Register** of March 23, 1984 (49 FR 11070), to solicit additional information on the risks posed by fires involving transformers containing PCBs, their frequency of occurrence, the costs of cleanup following these incidents, and the effectiveness and costs associated with regulatory control measures for mitigating or eliminating the risks posed by this equipment in fire situations. At that time, EPA indicated that it would use the new information to reconsider the use authorization issued in the PCB Electrical Use Rule for the continued use of most electrical transformers containing PCBs.

EPA received over 50 comments on the ANPR during the public comment period, which closed on May 22, 1984. EPA received information from a number of different sources, including the insurance industry, fire departments, building owners, industrial transformer users, and utilities. (The comments on the ANPR are summarized in: "PCB Transformer Fires: Comments on the Advance Notice of Proposed Rulemaking" (September 1984).)

After considering the comments received in response to the ANPR, and after completing further analyses of available data, EPA is issuing a Proposed Rule to address the risks posed by fires involving transformers that contain PCBs. This Proposed Rule presents EPA's determination that additional regulatory control measures are warranted. EPA's determination is based on an analysis of the risks posed by fires involving electrical transformers containing PCBs, the benefits of PCBs and the availability of substitutes, and the costs and benefits of control measures designed to mitigate or eliminate the fire-associated risks posed by this equipment. EPA is also reaffirming its August 1982 determination that the indefinite use of PCBs in electrical transformers in concentrations below 500 ppm does not pose unreasonable risks to public health or the environment.

II. Summary of Proposed Rule

Under section 6(e)(2)(B) of TSCA, EPA can authorize a use of PCBs provided that the use "will not present an unreasonable risk of injury to health or the environment." Although the continued use of PCBs in most electrical transformers was authorized in the PCB Electrical Use Rule, EPA did not consider the risks posed by fires involving this equipment of the costs or benefits of regulatory control measures to mitigate or eliminate these risks. EPA's decision to allow the continued use of electrical transformers containing PCBs was based on the reported low frequency of leaks and spills of PCBs from this equipment compared to the high costs associated with replacing this equipment with substitute transformers or requiring secondary containment to limit the spreads of spilled materials.

In this Proposed Rule, EPA has determined that PCB Transformer fires (fires involving transformers containing greater than 500 ppm PCBs), particularly fires which occur in or near buildings, do pose risks to humans and the

environment. EPA reached this determination after considering the extreme toxicity of materials which can be formed and released during fires involving this equipment, as well as the potential for human and environmental exposures to these compounds from a single incident, and the expected frequency of incidents over the remaining useful life of this equipment.

EPA has further determined that the continued use of PCB Transformers without additional restrictions does present an unreasonable risk of injury to health and the environment. EPA reached this determination after considering the risks posed, the costs of cleanup following these incidents, the availability of adequate substitute materials, and the costs and benefits associated with regulatory control measures designed to reduce the risks posed by fires involving this equipment. EPA is, therefore, proposing additional regulatory controls on the use of this equipment.

EPA is proposing to require: (1) The immediate registration of all PCB Transformers with appropriate fire department jurisdictions, and the immediate registration with building owners of all PCB Transformers located in or near buildings, (2) the immediate marking of the exterior of the vault door, machinery room door, means of egress, or grate(s) accessing a PCB Transformer with PCB identification labels, (3) the immediate removal of stored combustibles from PCB Transformer locations, (4) the installation, by July 1, 1988, of additional electrical protective devices on PCB Transformers in or near buildings in high secondary voltage systems (480/277 volt systems), and (5) the isolation, by July 1, 1988, of all PCB Transformers in or near buildings from building ventilation systems, building ductwork, and openings in construction to reduce the widespread contamination of structures and the environment by smoke and soot from PCB Transformer fires. In addition, to facilitate monitoring compliance with the isolation requirements, EPA is proposing that PCB Transformer owners maintain records of their efforts in isolating transformers through the completion of written PCB Smoke Spread Reduction Plans (PCB–SSRPs). EPA is proposing that all PCB–SSRPs be completed by July 1, 1988, that the records be maintained until the date the transformer is placed into storage for disposal or until the transformer is disposed (whichever occurs first), and that the records be made available for inspection, upon request, by EPA.

Finally, in the event of a PCB Transformer fire, EPA is proposing to require PCB Transformer owners to take immediate measures to contain potential water discharges, and to report all PCB Transformer fire-related incidents to the National Spill Response Center (NSC) prior to the initiation of cleanup efforts. EPA expects that these measures will reduce the likelihood of the discharge of water contaminated with PCBs, PCDFs, and PCDDs into waterways.

Although EPA expects that the above measures will reduce releases to waterways after the fire is extinguished, EPA remains concerned about the potential risks posed by releases to water which may occur during a fire or immediately after a fire, before measures can be taken to contain the PCBs and any potential oxidation products. Information on well-researched PCB Transformer fire indicates that significant releases of dielectric fluid to waterways did not occur in these instances. However, EPA believes that there is a potential for the contamination of waterways, drinking water supplies, and sewerage treatment plants from the spilling of PCB dielectric fluid, runoff, and the washing of PCBs and oxidation products down storm drains and sewers as a result of a fire-related incident. Floor drains in the transformer location and the presence of water pipes in the transformer location can facilitate the release of PCBs and their oxidation products into waterways during the very early stages of a fire, before measures can be taken to contain releases.

While EPA is not proposing to require the blocking or sealing of drains in PCB Transfomer locations (nor other protective measures specifically designed to reduce the potential for releases to waterways), EPA is soliciting comments on the practicality, feasibility, and cost of such requirements. EPA is also soliciting comments and information on the availability, effectiveness, and cost of heat sensitive-smoke sensitive drain closure systems or drain closure systems which can be triggered manually from locations outside the transformer vault or enclosure.

Any disposal and/or discharge of materials contaminated with PCBs, PCDFs or PCDDs as a result of a fire involving PCBs must be conducted in accordance with all applicable federal regulations including thoses issued under the Toxic Substances Control Act (TSCA), the Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA).

EPA has determined that the continued use of PCBs in PCB Transformers which comply with the requirements described above do not present unreasonable risks to public health or the environment. Further, after considering the risks posed by fires involving transformers containing less than 500 ppm PCBs, and the costs of regulatory control measures, EPA is reaffirming its August 1982 determination that the continued use of PCB-Contaminated transformers and non-PCB transformers (transformers containing 50–500 ppm PCBs, and less than 50 ppm PCBs, respectively) do not present unreasonable risks to public health and the environment.

Although EPA believes that sufficient data are available to support the development of these new proposed regulations, EPA recognizes that several relevant research projects are currently underway. The Electric Power Research Institute (EPRI) is sponsoring several ongoing studies of the formation of PCDFs from PCBs as well as a study of the effectiveness and costs of potential risk reduction measures, such as transformer isolation. EPA is also in the process of completing a study of the formation of PCDFs and PCDDs from the incomplete combustion of PCB-Contaminated fluid. The results of these studies could impact EPA's assessment of the magnitude of risks posed by fire-related incidents, and, may ultimately impact the scope of the final regulations and the nature of any required control measures.

The remainder of this preamble describes the basis for the determinations reached in this proposed rule.

III. Transformer Fire Risks

A. Summary of Findings

EPA has concluded that materials formed and/or released during fires involving transformers containing PCBs have the potential to be extremely toxic to humans. Data from two well-researched fires and data from laboratory studies on the formation of PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD establish the potential for the formation of relatively large quantities of these compounds through the incomplete combustion of PCBs and chlorinated benzenes (which are often present as diluents or contaminants in transformers containing PCBs). EPA uses the term "relatively large" because although the quantities of these materials formed are actually quite small (picogram levels), their extreme toxicities make even these small quantities of concern. EPA has concluded that the incomplete combustion of PCBs can result in the

formation of relatively large quantities of 2,3,7,8-TCDF, and, that the incomplete combustion of chlorinated benzenes can result in the formation of 2,3,7,8-TCDD, in addition to 2,3,7,8-TCDF.

In earlier rulemakings, EPA has already concluded that persons exposed to PCBs can develop chloracne; and, that based on laboratory animal data, there is a poential for reproductive effects and developmental toxicity as well as oncogenicity in humans exposed to PCBs. 2,3,7,8-TCDD has been described as an "unusually toxic" material, which exhibits acute, subacute, subchronic, chronic, teratogenic, and oncogenic effects at very low doses in laboratory animals.

Although toxicological testing of 2,3,7,8-TCDF has been more limited than toxicological testing of 2,3,7,8-TCDD, available studies indicate that these compounds display similar toxicological and biological activities for a wide range of end points including lethality, lymphoid atrophy, weight loss, porphyria, enzyme induction, and cystolic receptor protein binding. They are structurally similar compounds, with two chorinated benzene rings joined by one oxygen bridge in the case of dibenzofuran, and two oxygen bridges in the case of dibenzodioxin. In view of these similarities, EPA believes it prudent to assume that 2,3,7,8-TCDF will also produce other adverse effects comparable to those found following exposures to 2,3,7,8-TCDD. These toxicological effects include embryotoxicity, teratogenicity, reproductive effects, and oncogenicity.

EPA also recognizes that other compounds of potential toxicological significant may be produced and released from tansformer fires, such as other congeners of PCDFs and PCDDs, and polychlorinated biphenylenes. Limited toxicological testing of other PCDD congeners, such as 1,2,3,7,8-Pentachlorodibenzo-p-dioxin (1,2,3,7,8-PeCDD) and 1,2,3,7,8,9-and 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,7,8,9-HxCDD and 1,2,3,6,7,8-HxCDD) suggest that these congeners are qualitatively similar in their toxic action to 2,3,7,8-TCDD when comparisons are made in a single species; however, they are less toxic than the 2,3,7,8-TCDD congener. EPA expects that toxicological testing of 1,2,3,7,8-Pentachlorodibenzofuran (1,2,3,7,8-PeCDF), 1,2,3,7,8,9-Hexachlorodibenzofuran (1,2,3,7,8,9-HxCDF), and 1,2,3,7,8-Hexachlorodibenzofuran (1,2,3,6,7,8-HxCDF) would show that these PCDF congeners are qualitatively similar in toxic action to 2,3,7,8-TCDF. Finally, other PCDD and PCDF congeners and materials such as polychlorinated biphenylenes that have yet to undergo extensive toxicological testing may also have toxicologic significance.

Thus, the risks posed by exposures to soot and smoke from transformer fires are not limited to the risks posed by exposures to PCBs, and the 2,3,7,8-TCDD/TCDF congeners. However, EPA believes that reducing exposures to these extremely toxic congeners, 2,3,7,8-TCDF and 2,3,7,8-TCDD, will also reduce exposures to other materials of potential toxicological significance.

EPA believes that the risks posed to humans from transformer fires are related to four major factors: (1) The contests of the tansformer, most importantly, the amount of PCBs present in the transformer; (2) the combustion conditions (which are influenced by both the length of time that a transformer remains energized after a serious fault and the presence of stored combustibles in the transformer location); (3) the degree of dispersion of toxic chemicals from the transformer into areas where there is an increased risk of human exposures; and (4) whether emergency response personnel and the building owner are aware that a transformer involved in a fire contains PCBs, and that certain precautions should be taken to avoid exposure to toxic materials produced during combustion.

EPA believes that the amount of toxic incomplete combustion products formed from the burning of PCB dielectric fluid is linearly related to the amount of precursors present at the time of combustion. Fires (particularly those which occur in or near buildings) involving PCB Transformers pose much greater risks of human exposures to PCBs and oxidation products than fires involving transformers containing less than 500 ppm PCBs. Thus, the amount of PCBs present in a transformer greatly influences the level of risk posed by a fire involving this equipment.

In addition, combustion conditions play a significant role in the risks posed by transformer fires, through their influence on the release of PCBs, the volatilization of PCBs, and the formation of toxic products from incomplete combustion. EPA believes that the presence of stored combustibles in transformer locations, and, more importantly, the inability to completely deenergize a seriously faulted transformer are two factors that can result in sustained high temperatures in a transformer location. Sustained high temperatures increase the potential for the formation of large amounts of toxic products of incomplete combustion.

PCB Transformer fires in buildings can result in exposures to PCBs, PCDFs, and 2,3,7,8-TCDF, (and PCDDs and 2,3,7,8-TCDD in cases where chorinated benzenes are present), by building occupants and bystanders, in addition to emergency response personnel, the general public, and cleanup crews. Exposures may occur during the early stages of a fire (prior to and during evacuation), and continue during cleanup operations and following reoccupancy of a building.

EPA believes that the greater the dispersion of smoke and soot within a building from a transformer fire, the greater the potential for exposure of humans to PCBs and oxidation products, and therefore, the higher the risks posed. The presence of building ventilation equipment, ductwork, and openings in construction (including openings created for ventilation purposes) in transformer locations is the single most important factor influencing the potential for human exposures to smoke and soot from a fire involving this equipment.

EPA also believes that water may become contaminated with PCBs, PCDFs, and PCDDs from any or all of the following sources: (1) Direct leakage of dielectric fluid from the transformer; (2) fluid or soot being washed into a floor drain by firefighting water; (3) fluid or soot washed into a drain from burst water pipes; or, (4) the disposal of water contaminated during cleanup operations. If these fluids are not contained, they may either enter storm sewers or santiary sewers. Water in storm sewers may not undergo treatment. Therefore, these types of releases could result in the contamination of surface waters and drinking water supplies with large amounts of PCBs, and potentially, PCDFs and PCDDs.

Transformers located near buildings, such as those present in sidewalk or underground vaults in urban areas, are expected to pose similar risks in fire situations to transformers located inside buildings. This is because air intake vents are often present on the exterior of buildings. Smoke and soot issuing from a fire involving a transformer located in a sidewalk vault in an urban area can enter the building which the transformer serves or adjacent buildings through these vents.

Further, since sidewalk vaults and underground vaults are often accessible through basement areas of buildings, smoke and soot can enter the buildings through open doors, gaps in construction, and unsealed joints and conduits in the vault. Finally, sidewalk vaults are typically equipped with floor

drains to allow rainwater to drain from the bottom of the vault. These locations, therefore, are expected to pose similar risks in fire situations to indoor locations from the perspective of the potential for discharges to water.

Both indoor and outdoor transformer fires have the potential to expose emergency response personnel, the general public, and cleanup crews to PCBs. However, soot from a transformer fire in or near a building would pose risks of exposures by larger numbers of people to high levels of PCBs and oxidation products than transformer fires in outdoor locations, away from commercial and residential areas.

Smoke and soot from an outdoor fire involving a transformer containing PCBs would be expected to be more widely dispersed in the environment, e.g., transformers located in outdoor electrical substations or mounted on utility poles. Although outdoor PCB Transformers may fail and rupture, spilled PCBs would be less likely to be as readily volatilized compared to cases where the transformer is located in a vault or machinery room. Some of the heat generated from a fire in an outdoor location would be expected to dissipate in the environment. While the number of people potentially exposed to some low level of PCBs could be greater in the case of an outdoor fire, because of environmental contamination from spilled PCBs, individual human exposures to PCBs and oxidation products would be expected to be far greater from fires involving transformers which are located in or near buildings. Therefore, EPA expects that in general, the magnitude of risks posed by outdoor incidents will be smaller than the magnitude of risks posed by incidents which occur in or near buildings.

If information is submitted that indicates that outdoor PCB Transformer fires pose the same level of risk as transformer fires in or near buildings, additional restrictions on the use of this equipment may be required. In particular, EPA may consider requiring additional electrical protection on these transformers.

The final factor that influences the risks posed by fires involving PCB Transformers is whether emergency response personnel and the building owner are aware that a fire involves a PCB Transformer and of the nature of risks posed. Typically, a PCB Transformer fire in or near a building does not result in substantial structural damage to the building. From the perspective of a fire department (unless it was known that PCBs were involved) these incidents would be considered to be relatively minor fires, with some smoke, but little flame damage. For this reason, in at least one documented incident, emergency response personnel did not wear respiratory protection.

The owner of a building involved in a PCB Transformer fire, who is unaware of the contents of a transformer and/or the nature of the risks posed, may also consider such a fire to be relatively minor. This can lead to the premature opening of the building for reoccupancy. It is reasonable to assume that in the past, some buildings may have been only superficially cleaned followed a PCB Transformer fire. Superficial cleaning of visible traces of soot would leave residual concentrations of PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD in many areas of a building. Exposures to building occupants would be expected to continue following reoccupancy.

Further, even in cases where building owners are aware of the nature of risks posed by PCB Transformer fires, EPA recognizes that there is an enormous amount of financial pressure to reopen buildings. The most publicized PCB Transformer fires have occurred in major office building complexes, where many important tenants have been displaced, and substantial revenues lost.

B. The Toxicity of PCBs and PCB Oxidation Products

In earlier rulemakings, EPA has already concluded that, based upon available information, persons exposed to PCBs can develop chloracne; and, that based on animal data, there is a potential for reproductive effects and developmental toxicity as well as oncogenicity in humans exposed lto PCBs. While fires involving PCB-containing transformers have resulted in the release of large quantities of PCBs, these incidents have also resulted in the formation of toxic products of incomplete combustion.

Many other compounds of potential toxicological significance, including PCDFs, PCDDs, and polychlorinated biphenylenes, were measured in soot samples following fires involving PCB Transformers. However, the bulk of toxicity testing of PCDF and PCDD congeners have been completed on what are anticipated to be the most toxic species, the 2,3,7,8 substituted PCDFs and PCDDs. EPA has evaluated the risks posed by PCB Transformer fires through an evaluation of: (1) The the toxicities of PCBs, 2,3,7,8-TCDF, and 2,3,7,8-TCDD; (2) the toxicities and potential toxicities of other PCDF and PCDD congeners; and (3) the potential for exposure to these materials as a result of a fire.

While the majority of toxicological testing has been completed on PCBs, 2,3,7,8-TCDF and 2,3,7,8-TCDD, this does not mean that human and environmental exposures to other congeners of PCDFs and PCDDs as well as polychlorinated biphenylenes pose little risk of toxic effects. For example, limited testing of 1,2,3,7,8-PeCDD, 1,2,3,7,8,9-HxCDD, and 1,2,3,7,8-HxCDD suggest that these congeners are qualitatively similar in their toxic action to 2,3,7,8-TCDD, when comparisons are made in a single species. However, they are less toxic than the 2,3,7,8-TCDD congener. EPA expects that similar structure-activity relationships would exist between 2,3,7,8-TCDF and 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF. However, EPA also believes that reducing exposures to the extremely toxic congeners, 2,3,7,8-TCDD and 2,3,7,8-TCDF, will protect against exposures to these other compounds of potential toxicological significance.

According to EPA's February 1984 Ambient Water Quality Criteria (AWQC) for 2,3,7,8-tetrachlorodinbenzo-p-dioxin (2,3,7,8-TCDD), 2,3,7,8-TCDD is one of the most toxic substances known to man. It exhibits delayed biological response in many species and is highly lethal, at low does, to aquatic organisms, birds, and mammals. It has been shown to be acnegenic, fetotoxic, teratogenic, mutagenic (in a limited number of mutagenicity tests), carcinogenic, and adversely affects the immune response in mammals.

The AWQC lists the acute LD50 for 2,3,7,8-TCDD for several species. The oral LD50 values range from 0.6 microgram per kilogram (kg) body weight (bw) for guinea pigs to 5,051 micrograms per kilogram body weight for hamsters. The AWOC presents the acceptable daily intake (ADI) value for a 70 kg man as 0.00007 microgram 2,3,7,8-TCDD per day. This ADI is based on the lowest-observed-adverse-effect levels (LOAEL) in rats, and has been calculated in accordance with the National Academy of Science's guidelines for calculating an ADI based on a LOAEL.

Although the ADI value presented above is very low, it still may not be sufficiently protective of human health. This ADI level does not take into account the demonstrated carcinogenic effects of 2,3,7,8-TCDD in laboratory animals and that 2,3,7,8-TCDD is, therefore, a suspect human carcinogen. The AWQC concludes that 2,3,7,8-TCDD is an animal carcinogen and that the epidemiological findings are consistent with the conclusions drawn from animal studies that 2,3,7,8-TCDD is a probable human carcinogen.

The carcinogenic potency of 2,3,7,8-TCDD using the linearized multistage model has been estimated relative to 53 other chemicals which EPA's Cancer Assessment Group (CAG) has evaluated as suspect carcinogens. This potency index is 5×10^7 per millimole (mMol) per kilogram (kg) per day, making 2,3,7,8-TCDD the most potent animal carcinogen that the CAG has evaluated.

The limited data on other PCDD congeners indicate that they are qualitatively similar in their toxic action to 2,3,7,8-TCDD when comparisons are made in a single species. This is illustrated in mice, where 2,3,7,8-TCDD has an LD50 value of 0.88 micromoles (umol) per kilogram (kg) and 1,2,3,7,8-PeCDD; 1,2,3,6,7,8-HxCDD and 1,2,3,7,8,9-HxCDD have LD50 values of 0.94, 3.19, and 3.67 umol/kg, respectively.

Toxiocological testing of PCDFs, specifically, 2,3,7,8-TCDF, has been more limited than testing of 2,3,7,8-TCDD. The acute oral LD50 in the guinea pig is reported to be 5 micrograms per kg bw, as compared with the acute oral LD50 for 2,3,7,8-TCDD in this species which is reported to be 0.6 microgram per kg bw. Subchronic testing of 2,3,7,8-TCDF in rhesus macaques indicated that this compound is extraordinarily toxic, with a reported No Observed Effect Level (NOEL) below 5.0 parts per billion (ppb). The author of this study concluded that continued daily oral intake of small amounts of 2,3,7,8-TCDF gave monkeys a disease which is clinically and morphologically similar to acute or chronic ingestion of 2,3,7,8-TCDD. For most of the observed biological effects, the potency of the two compounds are within an order of magnitude of each other, with 2,3,7,8-TCDF being somewhat less toxic than 2,3,7,8-TCDD. Some scientists have estimated that 2,3,7,8-TCDF is 5 to 20 percent less toxic than 2,3,7,8-TCDD, but, about 1,000 times more toxic than PCB Aroclor 1242.

Based on its assessment of available literature on the toxicity of 2,3,7,8-TCDF and the structural similarity of 2,3,7,8-TCDF to 2,3,7,8-TDDD, EPA has concluded that it is prudent to assume that exposures to 2,3,7,8-TCDF would pose similar risks of toxic effects as exposures to 2,3,7,8-TCDD. Further, EPA believes that based on structure-activity relationships, other PCDF congeners, particularly 1,2,3,7,8-PeCDF, 1,2,3,6,7,8-HxCDF, and 1,2,3,7,8,9-HxCDF may also pose similar risks of toxic effects as exposures to 2,3,7,8-TCDF (and 2,3,7,8-TCDD).

Following the Binghamton fire, several researchers completed toxicological testing of soot samples in guinea pigs. Based on these studies, using Binghamton State Office Building (BSOB) soot, EPA has concluded that multiple exposures to soot from PCB Transformer fires have the potential to produce toxicity in the thymus, the hematopoietic system, the salivary gland duct epithelium and, possibly, the liver.

It is worth noting that thymic atrophy, bone marrow depletion, and diminished body weight gain, all effects of the subchronic administration of the BSOB soot, have been routinely demonstrated in acute studies in guinea pigs using PCDFs and PCDDs. In addition, the group of guinea pigs dosed with 231.1 ppm BSOB soot in the subchronic study exhibited symptoms characteristic of acute exposure to 2,3,7,8-TCDD and 2,3,7,8-TCDF, which include skeletal muscle degeneration, fatty changes in hepatocytes, and degeneration of gastrointestinal tract epithelium.

One paper stated that the oral LD50 of the BSOB soot in guinea pigs is 410 milligrams per kilogram body weight, which would classify this material as very toxic.

For more in-depth analyses of the toxicities of PCBs, PCDFs, and PCDDs see: "Response to Comments on Health Effects of PCBs Submitted by by the Chemical Manufacturers Association and the Edison Electric Institute (August 19, 1982)"; "HERD Work for Proposed Polychlorinated Biphenyl (PCB) Transformer Fires Rulemaking (September 1984)"; and, "Ambient Water Quality Criteria for 2,3,7,8-Tetrachlorodibenzo-p-dioxin (February, 1984)".

C. The Formation of Oxidation Products From PCBs

There is direct evidence of the formation of PCDFs and PCDDs from heating and burning commercial mixtures of PCBs and diluents. The direct evidence is from: (1) Chemical analyses of materials at the sites where fires were known to involve transformers that contained PCBs and chlorinated benzenes, and (2) laboratory experiments published in chemical and other literature. PCBs, PCDFs, and PCDDs were found in some soot specimens from both the Binghamton and San Francisco fires. PCDFs and PCDDs were not analyzed for in the soot from the Chicago fire, and samples from the Miami fire are currently undergoing analysis.

Laboratory studies provide the best available information on the conversion of pure PCBs to PCDFs. In these studies, a number of different PCB congeners and mixtures of congeners have been heated and the resulting materials analyzed for all PCDFs and PCDDs. A specific PCB compound reacts to form a limited number of PCDFs. The formation of PCDFs involves intramolecular elimination of three kinds of diatomic molecules, with or without some rearrangement of chlorine atoms on the phenyl rings in the product dibenzofuran. From the products obtained in the PCB reactions, the diatomic molecules, hydrogen, hydrogen chloride, and chlorine, are formed from hydrogen and chlorine atoms in ortho positions on each of the two phenyl rings in the original polchlorinated biphenyl molecule. The optimum temperture range for the published laboratory experiments was 600 °C. Yields of PCDFs have been reported to be as high as 10 percent (calculated on the amount of PCB decomposed) for reaction temperatures from 550 °C to 600 °C, but drop off to tenths of a percent at 500 °C and 650 °C.

The description and characterization of the chemical reactions occurring in a fire in which aroclors (or any other commercial mixtures of many PCB compounds) are burned are far more complex than the laboratory experiments. However, EPA believes that reactions observed in the laboratory should also occur in fire situations where the reactants and reaction conditions are similar to laboratory reaction conditions.

An uncontrolled fire of sufficient temperature (about 600 °C) to burn materials containing PCBs can result in the formation of PCDFs as large as 10 percent of the level of PCBs originally present in the materials. Concentrations would vary with the volume of contained combustion gases or constituents of material containing particulate combustion solids.

PCDFs and PCDDs have also been detected following high temperature incineration. High temperature incineration is required by EPA regulations to dispose of PCBs in oil. However, the levels of PCDFs and PCDDs measured following high temperature incineration have been substantially less than those measured following the above described laboratory experiments. This is because high temperature incineration requires a 1200 °C temperature, a 2-second residence time, and sufficient oxygen. As explained above, laboratory experiments indicate that the reaction temperature for the formation of PCDFs is optimized at around 600 °C (in low oxygen content), and that yields fall off with increasing temperatures.

PCB dielectric fluid may also contain chlorinated benzenes as diluents or

contaminants, as a result of past servicing activities. Laboratory experiments have shown the formation of PCDDs in addition to PCDFs from the pyrolysis of mixtures of chlorobenzenes. Amounts of PCDFs ranged as high as several tenths of a percent for mixtures of trichlorobenzenes. Tetra- and pentachlorobenzene mixtures formed amounts of PCDFs and PCDDs which were two orders of magnitude smaller than the amounts of these compounds formed by trichlorobenzene. These reactions are bimolecular and the experimental concentrations of chlorobenzenes were high.

The presence of low concentrations of chlorobenzenes as contaminants in dielectric fluids that also contain PCBs are not expected to lead to substantial increases in the amounts of PCDFs formed from burning or heating the PCBs, but, may result in the formation of some PCDDs. EPA believes that the PCDD levels found in the Binghamton soot samples resulted from the oxidation of chlorobenzenes. The low level PCDDs found following the San Francisco fire could have been associated with the presence of chlorobenzenes in that fluid as well.

EPA expects that mineral oil equipment and other types of equipment contaminated with PCBs may also pose certain risks in the event of a fire from the perspective of the formation of toxic pyrolysis products. Since the laboratory reaction and results in the formation of PCDFs from PCBs is intramolecular and an elimination reaction, the effect of lower concentrations of PCBs should have a minimal effect on the reaction rate or product yield at a given temperature. In fluids in which less PCB is present, EPA believes that the only consequence is that less total PCDF will be formed, since low concentrations alone are not expected to have any effect on the reaction rate, mechanism of reaction, or product yield.

With respect to possible burning or heating of commercial PCB mixtures at low concentrations in mineral oil, the flash point and fire point of the oil might increase the chances of having a fire start, and once an oil fire starts, it may provide suitable reaction conditions for producing PCDFs (and PCDDs, if chlorobenzenes are present) from commercial PCBs. The flash points and fire points of both mineral oil and silicone oil could permit the heating of dissolved or dispersed PCBs to temperatures comparable to the temperatures used in published studies of these reactions.

Some scientists have speculated, however, that the amount of PCDFs formed from the burning of PCB contaminated mineral oil may not be linearly related to the amount of PCBs present in the oil. These scientists theorize that the mineral oil will compete with the PCBs for available oxygen, reducing the likelihood of the formation of significant quantities of PCDFs. Several research projects which are currently underway (by EPRI and EPA) should provide some information on this issue over the next several months.

Compared to mineral oil, the higher flash point and fire point of silicone oils (a potential substitute fluid for retrofilling PCB Transformers) might reduce the chances of having a fire start. But, once a silicone oil fire starts, it may provide suitable reaction conditions for producing PCDFs (and PCDDs, when chlorobenzenes are present).

Preliminary results from a study of the formation of PCDF from the incomplete combustion of PCB-contaminated silicone oil suggest that there is a linear relationship between PCB concentration and the amount of PCDF formed during the combustion of PCB-contaminated silicone oil.

D. Causes of and Circumstances Surrounding PCB-Related Transformer Fires

From a risk assessment standpoint, there are two basic categories of transformer fires: (1) Fires in which there is little apparent distribution of PCBs, or formation and distribution of products of incomplete combustion, and (2) fires in which this formation and distribution occurs. Analyzing and comparing the circumstances surrounding transformer fires in each of these categories is beneficial in defining what, if any, characteristics make certain transformers more likely to be involved in incidents that result in the widespread contamination of buildings, and, in determining the typical causes of these fires to evaluate the expected effectiveness of risk reduction measures.

EPA has analyzed the circumstances surrounding four PCB Transformer fires which occurred in or near buildings: The Binghamton fire (February 1981); the San Francisco fire (May 1983); the Chicago fire (September 1983); and the Miami fire (May 1984). EPA has little information on actual cases of outdoor PCB Transformer fires and fires involving PCB-Contaminated transformers.

EPA has concluded that sustained high temperatures in transformer locations can cause the rupturing of a transformer, the release of PCBs, the volatilization of PCBs, and the formation of toxic products of incomplete combustion. High temperatures can be caused by arcing or electrical overloading as well as by fires or malfunctions in associated electrical equipment, and the ignition of stored combustibles. EPA has concluded that certain types of transformers may be more likely to undergo sustained high energy arching. EPA has also concluded that building ventilation equipment, ductwork, and openings in construction can lead to the widespread contamination of buildings by smoke and soot containing PCBs and oxidation products, that floor drains in the transformer location and water runoff can lead to the release of soot into waterways, and that exposures to firefighters and building occupants may be greater when they are unaware that a fire involves a PCB Transformer or of the nature or risks posed.

The Binghamton and San Francisco fires are fires which resulted in the distribution of PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD into buildings. Although PCBs were distributed beyond the room of origin of the fires in Chicago and Miami, the spread of PCBs was more limited than in Binghamton and San Francisco because the transformers were not located near building ventilation equipment or ductwork, and they were able to be rapidly deenergized.

Wipe samples from the first floor of the Miami building reportedly showed that low levels of PCBs were volatilized and dispersed into the building. Analyses of air handling filters from the First National Bank Building in Chicago demonstrated that PCBs had been volatilized and distributed as a result of this incident as well. Soot from the Chicago fire was not analyzed for the presence of PCDFs or PCDDs, and soot from the Miami fire is currently undergoing analysis by EPA for these materials.

All four of the above listed fires involved PCB Transformers containing over 50 percent PCBs. Three of the four transformers also contained 30–35 percent chlorinated benzenes. The San Francisco transformer reportedly contained Aroclor 1242. Based on available information, all four of these transformers were large power transformers in systems with higher secondary voltages (480/277 volts). The transformers were all located either in mechanical rooms, basement vaults or sidewalk vaults in urban areas, in or near large office buildings.

The cause of the Binghamton incident was a fire in the switchgear adjacent to the PCB Transformer. The heat from the fire in the switchgear caused a ceramic bushing to crack on the transformer, allowing 180 gallons of PCB dielectric

fluid to drain onto the floor. During the 50 minute period after this initial malfunction, there was repeated electrical arcing and reports of loud explosions. Photographs showed that the switchgear was completely destroyed, but there was little fire damage to the transformer.

The San Francisco incident was reportedly caused by a short circuit in high voltage cable in the vault. The heat generated by the burning of the cable insulation (or perhaps the cable itself physically striking a fin on the PCB Transformer) caused the transformer to rupture and release 60–70 gallons of PCBs. During the 2 to 3 hours after this initial malfunction, there was considerable vibration and loud noises occurring in the vault, probably as a result of electrical arcing.

The Chicago incident was reportedly caused by a fire in a bus bar between the PCB Transformer and the switchgear. The heat generated by this fire (or possibly electrical arcing) caused a small hole in the transformer casing and resulted in the release of 15 gallons of PCB dielectric fluid. This transformer was reportedly deenergized within 10 minutes of the initial fault, and there were no reports of loud explosions.

The Miami incident was reportedly caused by electrical arcing. The heat generated by the arc caused the transformer to rupture and release 100 gallons of PCB dielectric fluid. The transformer was reportedly rapidly deenergized after the rupturing of the transformer.

According to certain comments submitted in response to the ANPR, both the Binghamton and San Francisco fires developed into more serious incidents because the secondary (low side) voltage in the PCB Transformers in use was high enough to allow a selfsustaining arc to be formed after the transformer ruptured. Prolonged arcing results in the transfer of a tremendous amount of heat to the transformer. These comments indicate that PCB Transformer systems made up of transformers with higher secondary voltages can remain energized despite a fault on the secondary side of a transformer in a system, and result in a self-sustaining arc like that implicated in Binghamton and San Francisco. Comments on the ANPR also suggest that transformers in lower secondary voltage systems (such as 216/125 volt systems) are not as likely to experience a self-sustaining arc, and, are therefore, less likely to be associated with more serious fires.

Soot and smoke from the Binghamton and San Francisco fires entered buildings through openings in construction in the vault areas, as well as through building ventilation equipment and building ductwork. Smoke and soot from the Binghamton fire in particular were very widely distributed throughout the interior of the Binghamton State Office Building. Smoke from the Chicago fire issued from the sidewalk gate, and smoke from the Miami fire issued from a manhole cover accessing the transformer vault. While extensive building contamination was not reported for either the Chicago or Miami fires, PCBs were measured in other areas of the buildings and in air handling filters. A mitigating factor in the Miami fire was the lack of a centralized ventilation system in the building. A mitigating factor in the Chicago fire was the presence of a separate ventilation system serving the transformer vault, garage area, and small adjacent building.

From filmed accounts of the San Francisco fire, it appears that firemen and emergency response personnel were either unaware that the transformer involved in the fire contained PCBs or were unaware of the nature of risks posed. Firefighters above the sidewalk vault did not wear respirators, and bystanders were allowed to roam the area freely. According to representatives of Florida Power and Light (FPL) and the local fire department in Miami, firefighters wore full protective gear in responding to the Miami fire. Information on the level of protection utilized by firefighters responding to the Binghamton and Chicago fires was not available.

As a safety precaution, firemen reportedly fogged the area of the Binghamton transformer with a fine water mist, and used about 10–15 gallons of water. There were no provisions for containing liquids in the transformer area. A floor drain in the transformer location leads to a sump and then to the storm sewers, which ultimately empty into surface waters. However, the heat from the fire had caused fireproofing material from the ceiling to fall to the floor, where it blocked the drain. Thus, all accumulated fluids were, by a fortunate accident, contained and reportedly subsequently removed and disposed of properly.

According to Pacific Gas and Electric (PG&E), water was not used to extinguish the San Francisco fire. Further, none of the buildings water systems pass through the vault. No information is available on the use of water in the Chicago fire. In the Miami fire, 2 to 5 inches of water was reportedly present in the bottom of the vault as a result of a recent rainstorm. This water was reportedly contained within the vault, and FPL officials reportedly recovered all liquids on the floor of the vault, and placed these materials in containers for disposal.

Cleanup costs from the Binghamton and San Francisco fires approached $20 million per incident. Final cleanup costs are not available for the Chicago and Miami fires; however, EPA estimates that cleanup costs from the Chicago and Miami fires will be one to three orders of magnitude less than those incurred as a result of the Binghamton and San Francisco fires.

E. Exposure Assessment

Toxicity and exposure are the two basic components of risk. In Unit III.B, EPA addressed the toxicity of PCBs, the toxicities of 2,3,7,8-TCDF and 2,3,7,8-TCDD, and, the toxicities and potential toxicities of other PCDF and PCDD congeners, which were measured in soot samples following transformer fires. The purpose of the following analysis is to evaluate the potential for human exposures to PCBs and oxidation products from fires involving transformers containing PCBs.

EPA has evaluated the likelihood and nature of human exposures to PCBs and oxidation products from transformer fires for four separate cases: (1) A fire in a building involving a transformer containing 65 percent PCBs (and 35 percent chlorinated benzenes) in which PCBs are released, products of incomplete combustion are formed, and smoke and soot are spread throughout the building; (2) a fire in a building involving a transformer containing 65 percent PCBs (and 35 percent chlorinated benzenes) after the implementation of fire-related risk reduction measures; (3) an outdoor fire involving a transformer containing 65 percent PCBs (and 35 percent chlorinated benzenes); and (4) a fire in a building involving a transformer containing 0.05 percent PCBs (500 ppm PCBs) (and 0.026 percent chlorinated benzenes (269 ppm)), in which PCBs are released, products of incomplete combustion are formed, and smoke and soot containing these materials are spread throughout a building.

The first step in evaluating the potential for human exposures to PCBs and oxidation products is to determine the populations that are likely to experience these exposures. EPA has identified six populations that may be at risk of exposure to PCBs and oxidation products in the event of a fire involving a transformer containing PCBs. These are: (1) Persons present in a building or possibly in an adjacent building at the time of a fire in or near a building; (2)

firemen and other emergency response personnel responding to the fire; (3) onlookers present during the extinguishing of the fire and members of the general public in the vicinity of the fire; (4) persons involved in sampling and cleanup operations following the fire; (5) persons returning to the building following cleanup; and, (6) persons exposed to equipment, automobiles, etc. that may have been contaminated during or after the fire. Human exposures to PCBs and oxidation products from transformer fires would be expected to occur principally through the inhalation and dermal routes.

1. Exposures From PCB Transformer Fires

a. *Fires in or near buildings.* Arcing, electrical overloading, short-circuiting in high voltage cable, switchgear fires, fires in associated electrical equipment, and the ignition of combustible or flammable materials in a transformer location can all lead to the rupturing of a transformer and the volatilization of PCBs. Sustained high temperatures in the area of a ruptured transformer increase the potential for the formation of toxic products of incomplete combustion, including PCDFs 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD. These high temperatures can either occur as a result of the initial malfunction or as a result of prolonged arcing. Sustained high temperatures can also lead to the ignition of structural materials, and the rupturing of nearby water pipes. Smoke and soot from a high temperature fire involving a PCB Transformer can contain high concentrations of PCBs and oxidation products.

The most extensive monitoring data on PCB, 2,3,7,8-TCDF, and 2,3,7,8-TCDD levels in buildings following PCB-Transformer fires was obtained from the Binghamton State Office Building site. A composite soot sample from this fire indicated the presence of 7,200 ppm PCBs, 231 ppm 2,3,7,8-TCDF, and 2.9 ppm 2,3,7,8-TCDD. For a full description of PCB, PCDF, and PCDD levels measured following transformer fires, see "Exposure Assessment for Polychlorinated Biphenyls (PCBs) Polychlorinated Dibenzofurans (PCDFs), and Polychlorinated Dibenzodioxins (PCDDs) Released During Transformer Fires (September 1984)".

EPA believes that the levels of PCBs and oxidation products measured in soot samples following the Binghamton fire are values which are representative of situations in which combustion conditions are conducive to the formation and/or release of PCBs and oxidation products. However, for certain other parameters of the exposure assessment, such as the number of people exposed and the magnitude of potential exposures, the actual circumstances surrounding the Binghamton fire do not represent what EPA considers to be a true "reasonable worst-case situation." For example, the Binghamton fire occurred during a period of low building occupancy, cleanup has been extensive and still continues today, and building occupants have not been allowed to return to the building. EPA adjusted these parameters to develop what it consider to be a more environmentally conservative assessment of potential human exposures to PCBs and oxidation products from a PCB Transformer fire in a building.

EPA definess a reasonable worst-case PCB Transformer fire as a fire involving a PCB Transformer in which sustained high temperatures in the transformer location lead to the rupturing of the transformer casing, the release of PCBs, the volatilization of PCBs, and the widespread distribution of PCBs and oxidation products throughout the interior of a building, and potentially into waterways. EPA assumes that smoke and soot containing PCBs and oxidation products are spread throughout a large office building during peak use hours, that emergency response personnel are unaware that certain precautions should be taken to minimize exposures, and, that reoccupancy occurs only after the removal of visible traces of soot by cleanup crews.

EPA's assessment of the potential for human exposures to PCBs and oxidation products from a reasonable worst-case PCB Transformer fire in a building serves as the baseline for subsequent assessments of the expected effectiveness of fire hazard risk reduction measures. This assessment also serves as the baseline for assessing likely human exposures from PCB Transformer fires in outdoor locations (away from commercial and residential areas), and for estimating likely human exposures from PCB-Contaminated transformer fires in or near buildings.

A PCB Transformer fire which occurs in or near a building during a period of peak use may potentially expose hundreds or thousands of building occupants to smoke and soot from the fire during the evacuation of the building. The potential for exposures of large numbers of building occupants to this smoke and soot is significantly increased if the transformer involved in a fire is located near building ventilation equipment and ductwork. EPA estimates that evacuation times will be on the order of 6 to 8 minutes, and, that during these 6 to 8 minutes, building occupants will be exposed to smoke and soot, primarily through inhalation.

Emergency response personnel, unaware that the smoke and soot from the fire may contain PCBs and toxic products of incomplete combustion, may be exposed to these materials through inhalation, and may incur some dermal exposure to facial areas. EPA estimates that 30 to 60 emergency response personnel may be exposed for up to 3 hours during the extinguishing of a PCB Transformer fire. Dermal and inhalation exposure of firefighters and other emergency response personnel may continue during the completion of equipment maintenance procedures and during the cleaning of personal clothing and firefighting equipment after the fire.

Building occupants also may incur additional exposures (above those which may occur during building evacuation), if these parties remain nearby, as onlookers during the extinguishing of the fire. Further, there is an increased potential for these additional exposures when emergency response personnel (the principal authority figures at the scene of a fire) are unaware of the nature of risks posed by exposures to smoke and soot from these fires.

If a transformer involved in a fire ruptures and releases PCB dielectric fluid early, before measures can be taken to contain releases, there is a potential for contamination of surface waters and drinking water supplies. Further, if water is used to extinguish the fire or if water pipes rupture due to high temperatures caused by the fire there may be additional contamination of surface waters and drinking water supplies with PCBs, PCDFs, and PCDDs. PCBs, PCDFs, and PCDDs can reach waterways through unsealed floor drains, through fallout from airborne sources, and through runoff from the site. Members of the general public, in addition to fish and wildlife in the vicinity of a PCB Transformer fire may be exposed to PCBs and oxidation products through the ingestion of residues which have reached waterways. While comments on the ANPR suggest that water in not frequently used in extinguishing and electrical transformer fire, EPA believes that there is a potential for contamination of water from the rupturing of the tranformer, from burst water pipes, from the extinguishing of ingnited materials in the area (other then electrical equipment), and, from cleanup efforts.

The presence of a floor drain leading to a storm sewer in a tranformer location provides a readily accessible pathway for the contamination of surface waters, and potentially, drinking water supplies. PCB dielectric fluid and water contaminated with soot containing PCBs, PCDFs, and PCDDs can enter these drains as a result of the rupturing of the transformer casing, firefighting operations, burst water pipes, and cleanup operations. Very large amounts of water can become contaminated during cleanup operations. For example, during the first year of cleanup at the Binghamton site, over 100,000 gallons of water were used, treated by charcoal filtration and secondary treatment, and discharged to surface waters. The nearest drinking water intake downstream is 45 miles away and serves 16,500 persons.

Atmospheric transport of PCBs and oxidation products in an urban area could also be responsible for exposing many members of the general population who live or work in the vicinity of a fire. In the Binghamton, New York incident, 2,585 people lived within 3 to 4 kilimoters of the building. While inhalation exposures by the general public as a direct result of a PCB Transformer fire would be unlikely to occur for longer than one hour, soot fallout from a PCB Transformer fire may contaminate surface soil and surface water, in addition to outdoor furniture, automobiles, and other types of materials which are commonly stored outside. Contamination of surface soil and surface water may result in exposures to fish wildlife as well. Thus, dermal, inhalation, and even oral exposures to the general population in the vicinity of a fire may occur on a continuing basis long after the initial incident.

Exposures at the site of a fire to soot containing PCBs and oxidation products may also continue long after the extinguishing of the fire. Cleanup crews, dispatched to the scene by a building owner who is unaware of the nature of risks posed by a PCB Tranformer fire, may not be initially equipped with respiratory protection or protective clothing. Inhalation and dermal exposures would be expected to occur as these crews work to remove soot from surfaces inside the building. Soot particles are likely to become airborne as a result of cleanup efforts, and would be expected to be inhaled by workers. In addition, because of the strenous nature of cleanup work, these workers, would be expected to have a high respiration rate, further increasing exposures to PCBs and oxidation products through inhalation.

Even if respiratory protection and protective clothing are utilized by cleanup crews, EPA expects that some level of exposure to these materials may occur both dermally and through inhalation because of the expected prolonged period of exposure. Cleanup crews may work long hours for extented periods of time. For example, in the Binghamton incident, 40 to 70 workers were involved in cleanup operations for 7 hours a day for over 250 days.

Finally, depending upon the level of knowledge of the building owner, emergency response personnel, the utility, and local public health authorities about the nature of risks posed by PCB Tranformer fires, building occupants may be allowed to return prematurely to a building following the removal of only visible traces of soot. Exposures may occur to faces, hands, and lower arms for 8 hours a day over the course of 250 working days in a year. EPA also expects that inhalation exposures would occur as a result of the circulation of airborne contaminants by the building's ventilation system. Further, these exposures may continue for an indefinite period of time because these materials are expected to be quite persistent, and resistant to degradation. Residual concentrations may remain on interior building surfaces for sereval years.

EPA has developed more quantitative estimates of potential human exposure to PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8,-TCDD from a reasonable worst-case PCB Transformer fire. These estimates are presented in the document entitled: "Exposure Assessment for Polychlorinated Biphenyls (PCBs), Polychlorinated Dibenzofurans (PCDFs), and Polychlorinated Dibenzodioxins (PCDDs) Released During Transformer Fires (September 1984)". EPA is soliciting comments on the methodology used to develop these quantitative estimates of potential human exposures to PCBs and oxidation products as presented in this document.

b. *Fires with risk reduction measures in place.* In order to evaluate the effectiveness of risk reduction measures in reducing human exposures to PCBs and oxidation products, EPA has assessed expected exposures to these materials from a PCB Transformer fire in a building, assuming the implementation of several risk reduction measures. EPA assumes that combustible materials are not stored in the transformer location, and that electrical protective devices allow the PCB Transformer to be rapidly deenergized; that the transformer is isolated from building ventilation equipment, ductwork, and openings in construction; that measures are taken to control water releases; that the incident is reported to the National Spill Response Center; and, that the transformer is registered with both the responding fire department and the building owner. In addition, EPA assumes that the exterior of the transformer location is marked with PCB identification labels.

The potential for the volatilization of large amounts of PCBs, and the formation of products of incomplete combustion from PCB Transformer fires is reduced if efforts are made to control combustion conditions in the transformer location. EPA believes that the removal of stored combustibles from a PCB Transformer location, and the installation of additional electrical protection on PCB Transformers in higher secondary voltage systems (480/277 volts) will reduce the probability that these transformers will experience prolonged arcing. Actual case studies in which PCB Transformers in higher secondary voltage systems were rapidly deenergized in fire-related incidents indicate that EPA is correct in its belief that there are practical means available for successfully controlling combustion conditions in PCB Transformer locations to reduce the amount of PCBs volatilized and reduce the amounts of products of incomplete combustion formed.

Further, if the transformer is isolated from building ventilation systems, ductwork, and openings in construction, there is a reduced probability that volatilized PCBs and potential oxidation products present in soot and smoke will enter areas of high human occupancy. Instead, they will be contained within areas of low human use.

EPA does not believe that either of these measures used independently of each other will effectively reduce the risks posed by PCB Transformer fires in or near buildings. While the installation of increased electrical protection, in the form of a remote arc fault detection system, may reduce the likelihood of an incident occurring as a direct result of arcing, there are many other causes of PCB Transformer fires. When any fire occurs near enough to a PCB Transformer, the heat from the fire can cause the transformer to rupture. The heat from the initial malfunction can cause spilled PCBs to volatilize and can result in the formation of toxic products of incomplete combustion. Once the transformer loses its dielectric fluid, it will fail and may begin to arc. If electrical protective devices work or if external secondary disconnect switches

are available to insure that the transformer can be deenergized, this will curtail additional releases of PCBs and oxidation products.

Even transformers that are rapidly deenergized after an arcing fault occurs can rupture and release PCBs. If the transformer is located near building ventilation equipment and ductwork, volatilized PCBs from this transformer can be dispersed into areas of high human occupancy. Isolation alone may not be effective in reducing the risks posed by fires involving PCB Transformers, since a seriously faulted transformer that remains energized for hours can produce tremendous amounts of smoke and soot. EPA believes that few isolation techniques are available which will completely contain the amount of smoke generated from a faulted transformer that remains energized for hours.

If PCB Transformer owners take immediate measures to contain water potentially contaminated with PCBs, PCDFs, and PCDDs, EPA expects that any potential releases to water will be substantially reduced. The blocking of floor drains in a transformer location as soon as practically possible after a fire-related incident occurs and the containment of all water associated with the incident should reduce the potential for the release of untreated water into surface waters. Finally, by requiring the reporting of all PCB Transformer fire-related incidents to the National Spill Response Center (NSC), EPA will be able to monitor the treatment and discharge of water to insure that safe levels are not exceeded.

Although EPA expects that the above measures will reduce releases to waterways, EPA remains concerned about potential releases to water of PCBs, PCDFs, and PCDDs. This is because releases of PCBs, and potentially PCDFs and PCDDs through floor drains and via runoff may occur before measures can be practically taken to contain these materials. EPA recognizes, however, that none of the well-researched PCB Transformer fires actually resulted in the substantial contamination of waterways. Thus, EPA is not proposing control measures to prevent these potential releases. However, EPA is soliciting comments on the practicality and feasibility of requiring the blocking of floor drains in PCB Transformer locations and on the availability, effectiveness, and cost of heat or smoke sensitive drain closures as well as external manually operated drain closures.

Advance knowledge on the part of fire departments and building owners about the contents of a transformer and the notification of EPA in the event of a fire would be expected further to reduce exposures to building occupants, in addition to reducing exposures to firefighters and other emergency response personnel. EPA expects that firefighters, aware of the nature of risks posed by a transformer fire, would wear respiratory protection and protective clothing and would be more protective of bystanders and onlookers.

Finally, building owners who are aware that a transformer fire involves a PCB Transformer would be less likely to dispatch unprotected cleanup crews to the site, and may be less likely to allow building occupants to return unprotected to an involved building.

c. *Outdoor fires involving PCB Transformers.* Fires involving PCB Transformers located in outdoor locations, away from commercial and residential areas, are expected to result in lower human exposures to PCBs and oxidation products in fire situations than transformer fires in or near buildings. First, certain comments on the ANPR suggest that combustion conditions in an outdoor PCB Transformer fire may not be so conducive to the volatilization of spilled PCBs and the formation of large quantities of PCDFs, 2,3,7,8-TCDF, PCDDs, or 2,3,7,8-TCDD as would be the case with transformers located in machinery rooms or vaults. Generally, combustible materials are not present near outdoor PCB Transformers, and some of the heat generated from prolonged arcing or fires in associated equipment would be expected to dissipate in the environment.

Further, outdoor electrical substations in particular are generally fenced to restrict access to authorized personnel only, thus, limiting the number of people at immediate risk of exposure in the event of a fire. Third, in contrast to the smoke and soot produced from transformer fires in or near buildings, the smoke and soot from an outdoor transformer fire is expected to be more widely dispersed in the environment. Individual human exposures to PCBs would be anticipated to be reduced for outdoor transformer fires compared to transformer fires in or near buildings.

Thus, while there is a potential that emergency response personnel and cleanup crews responding to such fires may be exposed to some low levels of PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD, exposures to PCBs would be more likely to occur. Firefighting equipment and protective clothing may become contaminated with PCBs.

d. *Fires involving transformers containing less than 500 ppm PCBs.* PCB Transformers typically contain 65 percent PCBs, or about 1,300 times the maximum amount of PCBs present in PCB-Contaminated transformers (and 13,000 times the amount of PCBs present in transformers containing 50 ppm PCBs). EPA has assessed the potential for exposures to PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD from fires involving PCB-Contaminated equipment by assuming that the transformer present in the Binghamton State Office Building was a PCB-Contaminated transformer, and, by assuming reasonable worst-case values for other parameters. EPA assumed that the formation of PCDFs and PCDDs in a PCB-Contaminated transformer would be linearly related to the amount of PCBs present in the transformer. Given this situation, PCB, PCDF, 2,3,7,8-TCDF, PCDD, and 2,3,7,8-TCDD levels in the soot from such a fire would be expected to be reduced by a factor of 1,300, compared to levels actually measured in Binghamton. Similarly, human exposures to these materials are assumed to be reduced by the same factor.

2. Frequency of Occurrence

a. *Estimates of the number of transformers in use or in storage for reuse from the August 1982 rulemaking.* Transformers are used extensively by electric utilities and other industries to transmit and distribute electric power efficiently. Some transformers designed for use with PCBs contain between 60 and 70 percent PCBs; others, designed to contain mineral oil dielectric fluid, may be contaminated with PCBs from past servicing and manufacturing activities.

An estimate of the number of utility-owned transformers designed to contain PCBs was previously provided to EPA via an Edison Electric Institute and Utilities and Solid Waste Advisory Group (EEI/USWAG) survey of the utility industry. These data were presented in tabular form in the Proposed PCB Electrical Use Rule, published in the **Federal Register** of April 22, 1982 (47 FR 17426). In the August 1982 PCB Electrical Use Rule, EPA used these data, in combination with existing data from an earlier rulemaking to estimate the total number of PCB Transformers in service as well as the number of PCB-Contaminated transformers in service, and to estimate the distribution of these transformers among utility and nonutility owners.

(i) *PCB Transformers.* In the August 25, 1982 PCB Electrical Use Rule, EPA estimated that there were 140,000 transformers designed to contain PCBs in use or in storage for reuse. Of these transformers 114,469 were expected to

be in nonsubstation locations. EPA estimated that the utility industry owned approximately 22,469 of these in-service nonsubstation transformers, and that building owners and industrial users owned approximately 92,000 of the nonsubstation transformers. EPA estimates that at the end of calendar year 1984, there will be about 106,995 transformers designed to contain PCBs in use or in storage for reuse.

Because the August 1982 PCB Electrical Use Rule allows owners of untested transformers which were not orginally designed to contain PCBs, to assume that these transformers are PCB-Contaminated Electrical Equipment, EPA's economic analysis of the impact of this new proposed rule focuses on those PCB Transformers which were originally designed to contain PCBs.

(ii) *PCB-Contaminated transformers.* EPA also estimated that there are over 20 million mineral oil transformers in the electric utility industry and about five million in all other applications. These mineral oil transformers may contain low levels of PCBs (less than 500 ppm PCBs) as a result of contamination from past servicing activities. EPA estimated that approximately 18 million of these mineral oil transformers are used in nonsubstation applications.

b. *New information on PCB Transformers.* In late September 1983, a major building owner in the United States, the Equitable Life Assurance Society of the United States (Equitable Life), provided EPA with information on PCB Transformers present in its buildings. Using the survey data, EPA has derived a relationship between the size of a building (in square feet) and the number of transformers required to serve it. EPA has derived two additional estimates of the population on nonsubstation PCB Transformers, based either on the total square footage of commercial real estate reported by the Building Owners and Managers Association (BOMA), or the estimated square footage in nonresidential buildings that are three or more stories high and 10,000 square feet or more in size. These calculations assume that 33.65 percent of buildings use PCB Transformers (based on the Equitable Life survey) and result in estimates of 89,640 to 185,500 PCB Transformers in or near buildings.

Based on information from the August 1982 PCB Electrical Use Rule, the EEI/USWAG survey, the Equitable Life survey, and a survey of State of California-owned PCB Transformers, EPA has estimated the age and size characteristics of PCB Transformers located in or near buildings. EPA's analysis indicates that approximately 55 to 60 percent of PCB Transformers are expected to be less than 15 years old, and that nonutility owned transformers are generally smaller than utility-owned transformers. While this observation may not hold true for industrial transformer owners, differences in size between utility and nonutility transformers would be expected, since utility-owned transformers may serve more than one building.

EPA has also used data from the National Fire Incident Reporting system for 1982 to infer the location of transformers in or near buildings. According to its analysis, only 3.4 percent of transformers are located on the upper floors of buildings. Approximately 77 percent of transformers are located at or below ground level.

Based on the results of the Equitable Life survey, EPA estimates that 69 percent of transformers located on lower floors of buildings are vaulted, and that transformers located on interior upper floors are generally located in separate mechanical rooms. The majority of transformers located exterior to buildings are also vaulted. According to utility representatives, in many cases, more than one PCB Transformer is located in a vault. Typically, two to four PCB Transformers are located within a single vault.

c. *Estimates of frequency of transformer fires.* In the ANPR, EPA presented available data on the frequency of fire-related incidents involving PCB Transformers, and solicited comments on its estimates of fire frequency. The estimates presented in the ANPR range between 8 and 1,530 fire-related incidents per year.

The majority of comments on the range of estimates presented in the ANPR suggested that the more reasonable estimate of the expected frequency of PCB Transformer fire-related incidents were on the lower side of the range presented in the ANPR. The National Electrical Manufacturers Association (NEMA) estimated a frequency of 5 to 15 fire-related incidents per 100,000 PCB Transformers per year. Assuming a population of 140,000 units, NEMA estimates that there are 7 to 22 PCB Transformer fire-related incidents per year. NEMA also estimates that of these 7 to 22 fire-related incidents, 1 PCB Transformer fire per year is likely to result in cleanup costs on the order of $20 million.

Since the publication of the ANPR, EPA has become aware of several additional documented fire-related incidents involving PCB Transformers, in Tulsa, Oklahoma (December 29, 1983); and in Miami, Florida (May 29, 1984). Further, in May 1984, in Tulsa, Oklahoma, a fire occurred in the same building as the December 1983 fire, after a PCB Transformer was installed to replace the transformer that failed on December 29, 1983. This replacement PCB Transformer reportedly failed shortly after installation and was also involved in a fire-related incident.

Since the publication of the ANPR, EPA has also obtained additional information on the frequency of and circumstances surrounding PCB Transformer fires through its further analysis of the NFIRS data base for calendar year 1982. EPA focused its efforts on an analysis of transformer fires in or near structures.

In calendar year 1982, 213 structure-related electrical transformer fires were reported to the NFIRS. In order to interpret the NFIRS data properly, its limitations must be recognized. First, not all States report to the NFIRS, so that not all fires are contained within the system. EPA has corrected this value to account for the nonreporting States, and is estimating that 324 structure-related transformer fires occurred throughout the United States in 1982. A structure-related transformer fire is defined as a fire inside a building or structure in which an electrical transformer provided the principal heat that caused ignition. More importantly, however, based upon comments submitted in response to the ANPR and information from the NFIRS, EPA believes that only a percentage of these structure-related transformer fires may have in fact involved PCB Transformers. While information on the make, model, and year of transformers involved in fires is requested as part of the NFIRS, responses to this information request were very limited.

Despite the limitations of this information, EPA has used it in combination with comments submitted in response to the ANPR to estimate that 10 percent of structure-related transformer fires in 1982 involved PCB Transformers. Thus, EPA is estimating that in 1982 there were approximately 30 PCB Transformer fire-related incidents in or near buildings.

EPA has also utilized information from the NFIRS on transformer fire characteristics in order to obtain an estimate of the expected frequency of PCB Transformer fires in which there is distribution of smoke into buildings. These fires would be expected to result in an increased potential human exposures to PCB's 2,3,7,8-TCDF, and 2,3,7,8-TCDD (if these materials are indeed formed). EPA has developed an estimate of the number of PCB

Transformer fires involving the spread of smoke into buildings by estimating the number of electrical transformer fires in 1982 that resulted in smoke spread beyond the room of origin of the fire (based on reports filed with the NFIRS), and applying this percentage to the estimates of the number of PCB Transformer fire-related incidents. About 15 percent of all electrical transformer fires reported to the NFIRS in 1982 involved extensive smoke travel. Based upon this figure, EPA estimates that between 4 and 5 serious PCB Transformer fires occurred in 1982, or, between 0.003 percent and 0.004 percent of nonsubstation PCB Transformers (assuming a yearly probability of about 0.0015 percent of nonsubstation PCB Transformers.

3. Conclusions—Risks Posed by Fire Involving Transformers That Contain PCBs.

Toxicity and exposure are the two basic components of risk. In earlier units of this preamble, EPA evaluated the toxicity of PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD and presented assessments of the potential for human exposure to these materials from transformer fires. EPA concluded that both 2,3,7,8-TCDD and PCBs are suspect human carcinogens, based upon studies in laboratory animals. Further, since 2,3,7,8-TCDF is structurally and chemically similar to 2,3,7,8-TCDD, EPA has concluded that it is prudent to assume that this material is a suspect carcinogen as well. Finally, based on structure-activity relationships, other PCDF and PCDD congeners may also have oncogenic potential.

EPA has determined that relatively large quantities of these compounds can be formed and released during a fire involving a transformer containing PCBs, and that there are many routes through which building occupants, emergency response personnel, cleanup crews, onlookers, and the general public can be exposed to these materials.

EPA has concluded that fires involving PCB Transformers in or near buildings can pose significant risks of human exposures to PCBs and oxidation products. EPA believes that 0.003 percent to 0.004 percent of nonsubstation PCB Transformers per year are involved in fires where smoke (potentially containing PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD) is distributed into buildings, or approximately 50 incidents over the remaining useful life of PCB Transformers. NEMA estimates that about 0.0015 percent of nonsubstation PCB Transformers per year are involved in these types of incidents, or approximately 25 incidents over the remaining useful life of PCB Transformers.

A primary factor that contributes to the risks posed by PCB Transformer fires is the presence of building ventilation shafts, building ductwork, or openings in construction in the vicinity of the transformer. This factor significantly contributes to the spread of toxic materials from a transformer fire into areas of high human occupancy. A second factor that contributes to the risks posed by PCB Transformer fires is the failure of protective devices to deenergize a faulted transformer. A faulted PCB Transformer that remains energized can cause sustained high temperatures, the volatilization of large amounts of PCBs, and the formation and release of large amount of products of incomplete combustion. Other factors that contribute to the risks posed by PCB Transformer fires are the presence of combustibles in PCB Transformer locations, the presence of floor drains leading to storm sewers in transformer locations, the use of water to extinguish the fire, and the fact that emergency response personnel and the building owner may be unaware that a fire involves a PCB Transformer or of the nature of risks posed by fires.

Given that a single serious PCB Transformer fire in or near a building can potentially expose thousands of people to PCBs and oxidation products in soot in air, water, or on surfaces, EPA has concluded that PCB Transformer fires in or near buildings pose significant risks to human health and the environment. However, EPA also believes that reducing the potential for the distribution of PCBs and the potential for the formation and distribution of PCB oxidation products into areas of high human occupancy and into surface waters substantially reduces the risks posed by transformer fires.

EPA has further concluded that outdoor PCB Transformer fires, and fires involving PCB-Contaminated transformers pose lower risks than PCB Transformer fires in or near buildings. While EPA expects that outdoor PCB Transformer fires may result in the release of PCBs, EPA expects that outdoor PCB Transformer fires would be less likely to result in the volatilization of PCBs and less likely to lead to the formation and release of large levels of PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD. Although PCBs may be released and oxidation products may be formed during PCB-Contaminated transformer fires, the amounts of these materials formed and released are expected to be significantly reduced compared to the amounts formed and released from PCB Transformers.

IV. Benefits of PCB-Transformers and the Availability of Substitutes

As part of the unreasonable risk determination, EPA must consider both the benefits of PCBs and the availability of substitute materials. The unreasonable risk determination requires EPA to balance the risks posed by the use of PCBs against the availability of adequate substitute materials and the costs associated with regulatory control measures.

A. Benefits of PCBs

PCBs were originally used as dielectric fluid in electrical transformers primarily because of their fire-resistance properties. Generally, PCB Transformers were placed in locations where concerns for fire safety were paramount. Even today, PCB Transformers that are in storage for re-use are placed in service in or near buildings where fire safety is a concern. Other dielectric fluids, such as mineral oil, have superior electrical properties to PCBs, but their fire resistance properties are not as good as PCBs.

Monsanto Company has had in progress for over a year a study assessing and comparing fire risks of PCBs and of mineral oil. The technical summary of this study was submitted to EPA in response to the ANPR. The technical summary of the Monsanto-sponsored study indicates that the average frequency of a fire spreading beyond the transformer room is 300 times greater for a mineral oil transformer than for a PCB Transformer containing 50 percent PCBs and 50 percent chlorinated benzenes. The report further indicates that there is a significant decrease in the risk of fatalities when a mineral oil transformer is replaced by a PCB Transformer containing 50 percent PCBs and 50 percent chlorinated benzenes.

B. Substitute Transformers

In its August 1982 PCB Electrical Use Rule, EPA concluded that adequate substitutes exist for PCBs in indoor transformer locations. There are two basic categories of transformers, fluid-filled and dry. There are six general types of fluid-filled substitutes for PCBs in transformers: Silicones; high-temperature hydrocarbons (HTH); chlorinated hydrocarbons; non-PCB askarels; fluorocarbons; and mineral oil. The following unit summarizes available information on the fire safety and electrical properties of these substitute

fluids, and discusses available information on the toxicity of substitute dielectric fluids in combustion situations.

The property of having a fire point higher than 300 °C is one criteria that allows classification of fluids as "less flammable transformer fluids" by Factory Mutual Research Corporation (FMRC). This temperature is sufficiently high to afford resistance to small ignition sources, such as matches, but is still low enough to be met by several classes of commercial fluids, including silicone oil.

1. Silicones

Silicones refer to a family of relatively inert liquid organosiloxane polymers used as electrical insulation. Although silicone-filled transformers have been used since 1972, in the last 5 years, their use has increased significantly. They are superior to mineral oil and non-PCB askarels in thermal stability and, unlike mineral oil, will not degrade to form sludge. They also have fire points above 300 °C.

Combustion of silicones, whether by arc-induced explosion or spray mist ignition, produces flocculant silicone dioxide particles and globules of silica-gels. Breakdown products during arcing in the absence of oxygen are silicone dioxide, hydrogen, and hydrocarbons. Water, carbon dioxide, and carbon monoxide are also produced in the presence of oxygen. In the ANPR, EPA indicated that silicone fluids are self-existinguishing when burned in a pool, since a crust is formed which smothers the flame. One commentor indicated that crust formation is not really dependable, and will vary based on the specific combustion conditions.

Silicone transformer fluids also have some disadvantages. They absorb moisture from the air very rapidly and extreme care must be taken to transfer the fluid without contact with the atmosphere in order to maintain proper electrical properties. Product literature from one silicone fluid manufacturer roughly estimates that at 100 °C, silicone fluids will circulate 5 or 6 times more slowly than askarel or mineral oil. This slower rate of circulation may have implications on the ability of the fluid to dissipate heat.

2. High-Temperature Hydrocarbons (HTH)

EPA uses the term HTH to refer to mineral oils with a fire point higher than 300 °C. This category of fluids includes high temperature esters that are primarily used in railroad transformers. The primary advantages of HTHs are high fire point, low toxicity, biodegradability, and the long usage history compared with other transformer oils. The higher fire point of HTH fluids mitigates somewhat the fire hazard normally associated with the use of mineral oil in indoor locations.

HTHs are refined from paraffinic-type base oil. Breakdown products from complete combustion during arcing in the absence of oxygen are hydrogen, carbon, and hydrocarbons. Products produced in the presence of oxygen include water, carbon dioxide, and hydrocarbons. Data are not available on the products of incomplete combustion of HTHs.

Ester HTHs are used primarily in railroad transformers or where transformers must start up under very cold conditions. Because their cost is higher than other HTHs and they offer no real advantages in indoor locations, it is likely that the paraffinic HTHs will be the materials of choice for these uses.

The viscosity of at least some HTHs decreases more rapidly than other transformer fluids under the action of increased temperatures associated with overloading. This property allows more rapid cooling during overload conditions.

The primary disadvantage associated with the use of HTHs is that they have a higher heat release rate than other substitutes. This means that the HTHs will burn at over twice the temperature of silicone fluids, thus, potentially causing more damage in an indoor fire.

Another disadvantage of HTHs is the increased viscosity compared with that of mineral oils. This higher viscosity at normal operating loads causes slightly higher operating temperatures and could possible shorten the life of the transformer.

3. Chlorinated Hydrocarbons

Chlorinated hydrocarbons refer to a group of chlorinated aliphatic hydrocarbons. The primary chlorinated hydrocarbon being considered for use as an electrical insulating fluid is perchloroethylene. The primary advantage of perchloroethylene is its nonflammability.

Breakdown products from complete combustion during arcing include hydrogen chloride, carbon, carbon monoxide, carbon dioxide, and water.

4. Non-PCB Askarels

Non-PCB askarel is a generic term for a group of synthetic, fire-resistant, chlorinated aromatic hydrocarbons (chlorobenzenes) used as electrical insulating fluid. The primary advantages of the non-PCB askarels are their nonflammability and lower costs compared to HTHs and silicones. These fluids are treated the same as PCB-askarels in the National Electrical Code.

As mentioned in Unit III.C of this Notice, however, experiments have shown the formation of PCDFs and PCDDs from the incomplete pyrolysis of mixtures of chlorobenzenes in air. Amounts of PCDFs ranged as high as tenths of a percent for mixtures of trichlorobenzenes.

5. Fluorocarbons

Fluorocarbons (specifically Freon 113) are being tested for use as a transformer fluid.

6. Mineral oil

Mineral oil is a refined mineral insulating oil to which additives such as oxidation-inhibitor have been added. It is used in the vast majority of outdoor transformers.

If fire safety were not a consideration, mineral oil-filled transformers would probably be used in all applications. Mineral oils cost less than PCBs, have better heat transfer properties, are considerably lighter in weight, and form noncorrosive products under conditions of electrical arcing.

The major disadvantage of mineral oil is its flammability due to a low flash point. Information submitted in response to the ANPR suggests that the average frequency of a fire spreading beyond the transformer room is 300 times greater for a mineral oil transformer than for a PCB Transformer containing 50 percent PCBs and 50 percent chlorinated benzenes. If arcing occurs, the complete combustion breakdown products are hydrogen, methane, other hydrocarbons, carbon monoxide, and water. Data are not available on the products of incomplete combustion of mineral oil. The National Fire Code requires, with some exceptions, that oil-insulated transformers installed indoors be placed in vaults. Because of the cost of installing transformers in vaults, this is a disadvantage of mineral oil transformers.

As concluded in EPA's August 25, 1982 PCB Electrical Use Rule, EPA believes that adequate substitutes exist for PCBs in indoor transformer locations from the perspective of fire safety and electrical properties. Adequate substitutes include silicone-filled transformers and dry transformers.

C. Retrofilling PCB Transformers

1. Introduction

Two general types of substitutes for PCBs in transformers stand out as the best retrofill candidates. These fluids are silicones and high temperature hydrocarbons (HTH). The principal

questions to be considered are the cost of retrofill versus the value of the remaining life of the transformer and the qualification of the fluid as "less flammable" for insurance purposes. A related question is the potential for the formation of toxic products of incomplete combustion from the retrofill fluid and remaining residual concentrations of PCBs. Other fluids, such as chlorinated hydrocarbons, fluorocarbon, and mineral oil, may be used in new transformers but are inappropriate for retrofilling because the design of the PCB Transformers does not fit the properties of the fluids.

2. Silicones

There are six silicone fluids sold by six different companies for use as dielectric fluid. Four of the six fluids have been approved by FMRC as "less flammable" fluids. Silicones have a higher viscosity than PCBs and are therefore not quite comparable to PCBs as a coolant. For this reason, it is possible that transformers retrofilled with silicone would have to be derated. According to one silicone fluid manufacturer, if the transformer were fully loaded, a derating not exceeding 5 percent could be necessary. (Derating means lowering the maximum level of electrical load that the transformer can handle.)

It has been mentioned in the literature that a leaking problem could be created because silicone fluids are not compatible with silicone rubber gaskets and the coefficient of expansion of silicone fluids is 50 percent greater than that of PCBs. In actual practice, however, the silicone gaskets are replaced during retrofilling. (Further, even though the coefficient of expansion is greater than that for PCBs, the greater solubility of the filler gas (nitrogen) in silicone eliminates the expected increase in pressure.)

Experience with retrofilling PCB Transformers since the issuance of the August 1982 PCB Electrical Use Rule indicates that retrofilling with silicones to reclassify transformers as non-PCB may not be cost-effective in many cases at this time. Very few transformers retrofilled with silicone fluid have been able to reach and maintain PCB levels under 50 ppm. Companies contacted during the past few months have all agreed that retrofilling to reach and maintain less than 50 ppm PCBs is not cost effective. However, most thought that retrofilling to maintain levels under 500 ppm would be cost-effective in many cases.

3. HTHs

There are six HTH fluids sold by five companies that may be used as transformer dielectric fluids. There are also two products sold by two other companies that when mixed with other products may be used as HTH transformer fluids. Three of the six fluids are paraffinic based oils and three are esters. As mentioned earlier, the three esters are more specialized for use in railroad transformers.

The other three fluids are more viscous than the silicones at lower temperatures, but thin more rapidly at higher temperatures. According to an HTH manufacturer, this property allows the transformers to be retrofilled with HTH without any derating. At lower normal load temperatures, however, the transformers do run hotter. These fluids are completely compatible with the materials that make up PCB Transformers, and they are soluble in PCBs. Two of these fluids are approved by FMRC as "less flammable transformer fluids," and the fire point of the third is over 300 °C.

As with silicones, it does not seem practical to retrofill to maintain PCB concentrations under 50 ppm. However, it is possible and cost-effective in many cases to maintain concentrations under 500 ppm. The cost variables are about the same as for silicone fluids.

Because the paraffinic HTHs have high convective and radiant heat release rates, the owner's insurance company may recommend more stringent installation requirements.

V. Regulatory Options

A. Introduction

This unit summarizes the economic impact of various regulatory options for reducing the risks posed by PCB Transformer fires. (For a full analysis of the expected economic impacts, see "Regulatory Impact Analysis of the Proposed Rule for Indoor PCB Transformers.") The analysis includes a consideration of the expected savings in cleanup cost as a result of implementing these measures. The analysis also considers the expected outlays for cleanup from PCB Transformer fires involving widespread building contamination, if measures are not taken to reduce the likelihood of occurrence. EPA considered cost savings from the cleanup of leaks and spills of PCBs in the August 25, 1982 PCB Electrical Use Rule, and a similar methodology is used here.

Given the well-established toxicity of PCBs, and the presence of materials that are much more toxic than PCBs in the soot from a fire involving a PCB Transformer, owners of PCB Transformers involved in PCB Transformer fires have invested up to $20 million dollars each to ensure the safety of persons returning to occupy these buildings. For a full analysis of measures taken as part of the cleanup of the Binghamton fire, see "The Binghamton State Office Building Clean-up: A Progress Report Update, 1983," and "Investigation of the Contamination Remaining in the Binghamton State Office Building Following Completion of Preliminary Clean-up, October 20, 1982". These costs, for sampling, cleanup and removal of contaminated materials containing PCBs, PCDFs, and PCDDs found after these incidents can be factored into the economic analysis of the benefits of the continued use of PCB Transformers. Earlier analyses of the benefits of the continued use of these transformers, completed in support of the August 1982 PCB Electrical Use Rule, did not take into consideration the costs of cleanup in the event of PCB Transformer.

For purposes of the following analysis, EPA assumes that PCB Transformer fires with smoke spread into buildings will occur 50 times over the remaining useful life of this equipment, or at a rate of between 0.003 percent and 0.004 percent of nonsubstation PCB Transformers per year, and that cleanup costs from these incidents will approach $20 million each. EPA's estimate of cleanup costs associated with these events was derived from estimates provided from the Binghamton and San Francisco incidents. Further, in the analysis presented below, EPA assumes that little cost is normally associated with cleanup following non-PCB transformer fires in cases where little structural damage occurs to the building involved in the fire.

B. Regulatory Options and Economic Impacts

1. Take No Additional Action

The first regulatory option that EPA considered was to take no further regulatory action at this time to restrict the use of PCBs in transformers. This would allow the continued use of PCBs in transformers without additional restrictions above the requirements of the August 1982 PCB Electrical Use Rule. That rule authorized the continued use of transformers containing PCBs (that pose no exposure risk to human food or animal feed) for the remainder of their useful lives subject to certain recordkeeping and inspection requirements, based on the concentration of PCBs in the equipment.

There are no costs to transformer owners associated with EPA's allowing the continued use of transformers containing PCBs, other than the potential future costs associated with cleanup and liability suits following fires involving this equipment. If the use of PCB Transformers is authorized indefinitely, without additional restrictions, EPA expects that additional incidents will occur. Based on the NFIRS data base, EPA currently estimates that in 1982 there were 4 fires involving PCB Transformers in or near buildings where smoke and soot were distributed in the buildings. This figure translates into an annual probability of 0.003 percent to 0.004 percent of the total number of nonsubstation PCB Transformers in service each year, or about 50 incidents over the remaining useful life of this equipment.

For purposes of this analysis, these 50 incidents would be expected to require cleanup efforts whose cost would approach $20 million each (1983 dollars) or an estimated $375 million over the remaining useful life of this equipment.

2. Labeling and Registration Programs

The registration of transformers which contain PCBs with fire departments and building owners, in combinations with the labeling of the exterior of transformer locations with PCB identification labels may be effective in reducing exposures to firemen, building occupants, and bystanders. Compared to the other regulatory alternatives under consideration (other than the alternative of taking no additional action), the cost of this option is relatively low. EPA believes that in addition to registration with fire departments, the labeling of the exterior of transformer locations is necessary to insure that emergency response personnel arriving at the scene of a fire know that the fire involves a transformer that contains PCBs. EPA expects that the costs of labeling the exterior of PCB Transformer locations will be about $20.00 per transformer. The labeling of the exterior of PCB-Contaminated transformer locations would be expected to be significantly higher, since this may involve analytical testing to determine the PCB concentration in each transformer.

The costs of registering PCB Transformers are also expected to be minimal, since the location of all PCB Transformers should already be known by the owners of the equipment. The costs to transformer owners of forwarding this information to building owners and to fire departments is expected to be minimal, on the order of $50.00 per transformer. The costs associated with registering PCB-Contaminated transformers would be expected to be significantly higher, since this may also involve analytical testing to determine the PCB concentration in each transformer.

EPA estimates that total costs of labeling and registration programs for PCB Transformers would be approximately $10 million.

3. Smoke Control Technologies

Certain design techniques or changes to transformer locations are expected to be effective in reducing the risks associated with fires involving transformers containing PCBs. The objective of isolation is to reduce the widespread contamination of structures and the environment by smoke and soot from a transformer fire. These techniques often include the modification of the ventilation system serving the transformer location and sealing cracks or openings which would permit smoke to escape freely into occupied areas and the environment. In the more serious transformer incidents, the presence of building ventilation systems, building ductwork, and openings in construction in transformer locations have been responsible for the dispersion of toxic contaminants into buildings. Based on comments, isolation techniques are expected to be 85 to 90 percent effective in limiting the spread of smoke and soot from a transformer fire.

Unlike the ventilation systems for other oil-filled transformers, the ventilation systems for PCB Transformers were not designed for the purpose of fire isolation but rather were designed only to keep the ambient temperature at or below 30° Centigrade (C). However, the removal or alteration of existing ventilation systems could result in higher operating temperatures which shorten transformer operating lives and may increase the likelihood of equipment failure.

Thus, the design of alternative ventilation or cooling systems may be necessary to reduce the potential for building contamination. Ventilation alternatives include air conditioners, redirected venting, and heat exchangers, or simply limiting the contamination potential of the existing system by reducing the ventilation cooling effectiveness.

A practical alternative to the modification of ventilation systems is to install a smoke-activated device which shuts down the ventilation system and seals off an enclosed transformer. Installation of a smoke-activated closure would probably cost less than $1,000.

Although specific design changes and costs of isolation techniques are dependent on the individual transformer location, EPA has developed some general costs estimates. A firm involved in survey and design projects for PCB Transformers estimates that in 85 to 90 percent of all cases where isolation is the desired alternative, the costs are about $8,000 per transformer location.

For purposes of the cost-effectiveness analysis, an average cost of $8,000 per location is assumed for all locations where some form of suitable transformer enclosure is already present. For nonenclosed transformers, an estimated cost of $15,000 is assumed for retrofit of an enclosure that provides for smoke containment.

The total real costs of isolation procedures depend upon the time allowed for their implementation. The total real resources costs (costs prior to deducting savings as a result of avoided cleanup operations) associated with requiring the isolation of PCB Transformers located in or near buildings over a 3-year period are estimated at $500 million. The net cost, after deducting expected savings as a result of avoided cleanup operations, is estimated at $222 million. The total real resource cost associated with requiring the isolation of PCB Transformers in or near buildings over a 5-year period is estimated at $444 million. The net cost, after deducting expected savings as a result of avoided cleanup operations, is estimated at $201 million.

EPA is also proposing to require PCB Transformer owners to maintain records of isolation procedures completed, in the form of PCB–Smoke Spred Reduction Plans (PCB–SSRPs). These records would be necessary for compliance monitoring purposes and would be retained until the transformer is placed in storage for disposal or actually disposed of (whichever is earlier). EPA has developed a proposed guidelines document for preparing PCB–SSRPs, and is soliciting comments on it. This document is entitled: "Guidelines for the Preparation and Implementation of a PCB–Smoke Spread Reduction Plan."

EPA expects that maintaining these records will create a minimal additional burden on PCB Transformer owners (above the burden created by requiring transformer isolation procedures).

4. Floor Drain Closure Systems

The sealing off of floor drains in PCB Transformer locations, the installation of heat or smoke sensitive drain closures, or the installation of an external manually operated drain closure would reduce the potential for

the contamination of waterways with spilled PCBs and PCDFs and PCDDs through unsealed floor drains. EPA is not proposing to require any of these measures, based on its current analysis, but, is soliciting comments on their practicality, feasibility, effectiveness, and cost.

5. Increased Electrical Protection and External Disconnect Switches

The installation of certain safety equipment, such as pressure relief devices, current-limiting fuses or infrared sensors for remote arc-fault detection, may reduce the probability of fire or explosions in PCB Transformers, particularly events resulting from electrical malfunctions.

Current-limiting fuses work to monitor the flow of current into a transformer, and in the event of a power overload they will shut down the transformer. Comments indicated that these fuses are effective in avoiding catastrophic failures in PCB Transformers. However, other sources noted that current-limiting fuses may be less effective on transformers with high secondary voltages (480/277 volts versus 208/122 volts) because the current is lower. According to these sources, the current generated in a high resistance arcing fault may not be great enough to activate the fuse. Data from the more well-publicized PCB Transformer fires support this assertion. While it is often possible to install more sensitive fuses in place of existing ones, this increased sensitivity may also result in additional false outages. Such false outages decrease the reliability of the system.

Infrared sensors are continuous heat-detection monitoring devices located inside the transformer location. These sensors are used for remote arc-fault detection, and operate automatically to de-energize the transformer in the event of a fault. Since electrical arcs can cause fires, the risk of fire as a result of electrical arcing is reduced with the installation of an infrared system.

In addition to or in place of electrical protection, placement of manually operated switches external to or away from a transformer location may be useful. When electrical protection fails or is not present, an arcing fault may persist until the transformer is deenergized. This deenergization can be accomplished more rapidly by fire personnel or utility representatives if external switches are present. In most cases, the secondary transformer circuit is involved in an arcing fault, so that a secondary disconnect switch would suffice.

The cost of installing increased electrical protection depends both on the form of protection and whether the device involves a retrofit of the transformer. Of the devices considered, heat-sensing (infrared) devices are likely to be the most effective means of preventing catastrophic failures due to fires from arcing faults. In all of the well-researched cases, arc faults resulting in catastrophic failures occurred on the secondary coil circuit of a transformer with a higher secondary voltage (480/277 volts). EPA's analysis of the costs associated with this option considers the costs of requiring the installation of heat-sensing (infrared) devices on transformers with higher secondary voltages. These devices would be expected to rapidly deenergize the secondary circuits of these transformers in the event of an arc fault.

Assuming that two such devices are used per transformer, an average cost of $2,000 per transformer is used for this analysis. The costs associated with requiring the installation of these devices on all PCB Transformers is estimated at $213 million. The total costs associated with requiring the installation of these devices on only PCB Transformers with high secondary voltages (located in or near buildings) is estimated at $106 million. While it is difficult to estimate the incremental savings in cleanup cost that would be associated with installing these devices, EPA believes that these types of devices, in addition to the implementation of isolation procedures, would be effective in actually avoiding serious PCB Transformer fires. EPA has already accounted for this savings in its analysis of the net cost of isolation procedures.

The costs associated with installing an electrical switch exterior to a transformer vault or in a remote location away from the transformer have also been considered. Since in most cases arc faults appear to occur on the secondary coil circuit, the cost analysis considers the cost associated with installing a switch to deenergize the secondary circuit. EPA estimates the cost of installing external secondary disconnect switches at $1,000 per location.

EPA's estimate of the total resource cost associated with installing secondary disconnect switches on PCB Transformers located in or near buildings is $73 million. If EPA required the installation of these switches only on PCB Transformers with high secondary voltages, EPA estimates the total resource costs at $36 million. As was the case for infrared arc fault detection devices, EPA expects savings in cleanup costs to be realized only if these devices are used in conjunction with the isolation of the transformer. EPA has already considered these expected savings in its analysis of the net cost of isolation procedures.

6. Retrofilling

Retrofilling of PCB Transformers to reduce the PCB concentration to below 500 ppm would be expected to reduce human and environmental exposures to PCBs and their oxidation products in the event of a fire. This would be accomplished through a substantial reduction in the amount of PCBs present in the transformer. EPA has completed an analysis of the costs of retrofilling PCB Transformers to reduce PCB concentrations to below 500 ppm. EPA estimates that retrofill costs will range from $15,505 for a 50 KVA transformer to $32,034 for a 3,000 KVA transformer. these estimates include the costs of disposal of PCB fluid, but do not include any consideration of a loss of efficiency or derating as a result of the retrofill.

An estimate of the total resource costs of retrofilling of all nonsubstation PCB Transformers (106,995 at end of 1984) to below 500 ppm is about $1.6 billion. Although the retrofilling of PCB Transformers reduces the risks to humans posed by the transformer in the event of a fire (by reducing the amount of PCBs present, the amount of PCBs released, and the amount of PCDF formed and released), it is difficult to estimate the effectiveness of this option in avoiding cleanup costs from fire incidents.

An estimate of the total resource costs of retrofilling all PCB Transformers to below 500 ppm is about $1.9 billion.

7. Phaseout of PCB Transformers

a. *PCB Transformers in or near buildings.* The removal of PCB Transformers from locations in or near buildings would eliminate the unique fire-related risks posed by the continued use of this equipment. The following table uses a population of 106,995 units (EPA's estimate of the number of PCB Transformers in or near buildings that will be in use at the end of 1984) and an estimate of equipment life of 30 years, and presents total real costs of phase-out over 5-, 10-, and 15-year periods, as well as potential cleanup costs avoided. EPA assumes a serious PCB Transformer fire rate of 0.003 percent of in-service PCB Transformers per year, and clean-up costs per serious event of $20 million. EPA did not consider an immediate ban because several persons indicated that manufacturing capacity was insufficient to allow for this option. For a full description of the assumptions used in the following analysis, and for a

more detailed analysis of phaseout costs versus cleanup costs avoided, see "Regulatory Impact Analysis of the Proposed Rule for Indoor PCB-Transformers, June 15, 1984."

TABLE 1.—PHASEOUT COST COMPARISON

[Millions of dollars]

Reg. option	Cost	Clean-up costs avoid-ed	Net cost
15-Year Phase Out	$277	$48	$229
10-Year Phase Out	689	119	570
5-Year Phase Out	1,529	265	1,206

b. *PCB Transformers in outdoor locations.* The removal of PCB Transformers from outdoor locations is unlikely to result in a reduction in the frequency of transformer fires that involve higher human exposures to PCBs and their oxidation products. This is because EPA expects that outdoor PCB Transformer fires result in lower human exposures to PCBs and their oxidation products than exposures which result from PCB Transformer fires in or near buildings. EPA has, however, estimated the costs associated with requiring the removal of an estimated 23,743 PCB Transformers in outdoor locations, over 5-, 10-, and 15-year periods. A 5-year phaseout is estimated to cost $336 million, a 10-year phaseout is estimated to cost $152 million, and a 15-year phaseout is estimated at $62 million.

VI. Risk/Benefit Assessment

1. Use of PCB Transformers in or Near Buildings

PCBs can be released in fires involving PCB Transformers, and (depending upon the contents of the transformer and the combustion conditions), 2,3,7,8-TCDF, PCDFs, 2,3,7,8-TCDD, and PCDDs can be formed. Laboratory studies on the formation of PCDFs from PCBs, and PCDDs from chlorinated benzenes, as well as sampling data from actual PCB Transformer fire sites confirm that PCBs can be released and 2,3,7,8-TCDF and 2,3,7,8-TCDD (as well as other PCDF and PCDD congeners) can be formed and released from fires involving PCB Transformers.

PCB Transformers that remain energized after major faults or high energy arcs are more likely to result in the volatilization of large amounts of PCBs and the formation of large amounts of PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD through incomplete combustion than PCB Transformers that are able to be rapidly, and completely deenergized when an arc or fault occurs. Further, based on its analysis of well-researched PCB Transformer fires, and information submitted in response to the ANPR, EPA has concluded that PCB Transformers in high secondary voltage systems (480/277 volts) appear to be more likely to undergo sustained high energy arcing than transformers in low secondary voltage systems.

EPA has also concluded that the presence of combustible materials in a transformer location increases the potential for sufficient heat to be generated after any arc or fault occurs to cause a transformer to rupture and result in the release of PCBs, and the potential formation and release of products of incomplete combustion. Both sustained high energy arcing and the ignition of combustibles in a transformer location can generate enough heat to result in the volatilization of large amounts of spilled PCBs, and the potential formation and release of large amounts of PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD.

Significant exposures of humans to PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD may occur, if: (1) The transformer involved in a fire is located near building ventilation equipment, building ductwork, or openings in construction; (2) water containing these materials is allowed to enter floor drains and contaminate surface waters; and (3) emergency response personnel and the building owner are unaware that a transformer contains PCBs and of the precautions which should be taken to avoid exposures. EPA evaluated expected human and environmental exposures to PCBs and oxidation products from a reasonable worst-case fire involving a PCB Transformer in a building, and evaluated the risks posed to different population groups, including firemen, building occupants, and cleanup crews. Based on the results of this risk evaluation, EPA has concluded that PCB Transformer fires in or near buildings have the potential to pose significant risks to human health.

PCB Transformer fires in or near buildings that result in the distribution of smoke and soot beyond the room of origin of the fire are anticipated to occur at a frequency of 0.003–0.004 percent of nonsubstation PCB Transformers per year. Without additional control measures on the use of this equipment, EPA anticipates about 50 of these incidents over the remaining useful life of nonsubstation PCB Transformers.

EPA has determined that a single serious PCB Transformer fire may expose hundreds to thousands of people to PCBs, PCDFs, 2,3,7,8-TCDF, PCDDs, and 2,3,7,8-TCDD. The fact that PCB Transformer fires are anticipated to occur at a regular yearly rate and that a single serious PCB Transformer fire can pose high risks to human health combine to make PCB Transformer fires in or near buildings of sufficient concern to EPA to warrant the consideration of additional regulatory control measures on the use of the equipment.

EPA recognizes that PCBs are excellent dielectric fluids from the perspective of fire safety and electrical properties. Further, based on comments on the ANPR, there is evidence to support a determination that the use of PCBs over the past 40 years has reduced fire losses and fatalities associated with electrical transformer fires. EPA is concerned about increasing the potential for fire fatalities and property damage from electrical transformer fires in buildings by mandating the rapid removal or retrofill of PCB Transformers.

This is not to say that adequate substitutes are unavailable for PCB Transformers located in or near buildings. As set out above, EPA believes that adequate substitutes exist for PCB Transformers in or near buildings.

However, there will be approximately 106,995 nonsubstation PCB Transformers in use or in storage for reuse at the end of 1984. The costs of regulatory control measures designed to mitigate the unique risks posed by fires involving PCB Transformers in or near buildings must be balanced against the magnitude of risks posed by these incidents assuming use for the remaining useful life of the equipment.

Since immediate removal of PCB Transformers is not possible without wide disruption of electrical service, the phaseout of PCB Transformers located in or near buildings over a 5-year period is clearly the preferred regulatory option from the perspective of avoiding the maximum number of serious PCB Transformer fires in or near buildings. This option would be expected to avoid 40 serious PCB Transformer fires in or near buildings that would have otherwise occurred over the remaining useful life of this equipment.

However, the costs associated with the removal of all PCB Transformers located in or near buildings by July 1, 1990 are very high. The total real resource costs are estimated at $1.5 billion. Even after deducting cleanup costs that would be avoided by a 5-year phaseout (as a 5-year phaseout would be expected to avoid 40 serious incidents), the net costs are expected to reach $1.2 billion. The net cost of a 5-year phaseout in terms of the net cost

per serious incident avoided is about $31 million.

The removal of PCB Transformers in or near buildings over a 10-year period is expected to avoid 21 serious PCB Transformer fires at a total cost of $689 million, while the removal of PCB Transformers in or near buildings over a 15-year period is expected to avoid 14 serious PCB Transformer fires at a total cost of $277 million. After considering cleanup costs that would be avoided by 10- or 15-year phaseouts, the net costs are estimated at $570 million for a 10-year phaseout, and $229 million for a 15-year phaseout. The net cost of a 10-year phaseout in terms of the net cost per serious incident avoided is about $21 million. The net cost of a 15-year phaseout in terms of the net cost per serious incident avoided is about $14 million.

The total real resource costs of the immediate retrofilling of PCB Transformers in or near buildings to enable the transformers to be reclassified to PCB-Contaminated status are estimated at $1.6 billion. Since it is difficult to determine the impact of retrofilling to 500 ppm PCBs on cleanup costs from serious transformer fires, EPA has assumed that there will be no savings in cleanup costs. EPA does believe, however, that the risks posed to public health by fires involving PCB-Contaminated transformers are substantially less than the risks posed by fires involving PCB Transformers, by virtue of the much lower amounts of PCBs present in contaminated equipment.

EPA's study of the causes of and circumstances surrounding PCB-Transformer fires in or near buildings suggested certain similarities among more serious PCB Transformer fires. First, more serious PCB Transformer fires appear typically to involve PCB Transformers which are located near building ventilation equipment, building ductwork, and openings in construction. Second, more serious PCB Transformer fires appear to be typically associated with the failure of electrical protective devices to deenergize the secondary circuit after the transformer ruptured and released PCBs.

Further, only a fortunate accident in the Binghamton incident (the blocking of the floor drain by debris) prevented the discharge of spilled PCBs and contaminated water into storm sewers. Finally, PCB Transformer fires may result in higher human exposures when emergency response personnel and the building owner are unaware that a fire involves a PCB Transformer and that certain precautions should be followed to avoid exposures.

These factors that increase the probability of a more serious PCB Transformer fire occurring and increase the potential for human exposure to PCBs and oxidation products are potentially correctable without having to resort to the removal or retrofill of the transformer. The installation of heat sensitive (infrared) monitors which are designed to deenergize a transformer's secondary circuit in the event of a fault or the installation of external secondary disconnect switches (on transformers with high secondary voltages (480/277 volts)); the removal of stored combustibles from transformer locations; and the isolation of PCB Transformers in or near buildings from building ventilation equipment, building ductwork , and openings in construction; and requirements to contain water releases and report PCB Transformer fire-related incidents to the NSC are measures which EPA expects will reduce the probability of PCB Transformer fires and exposures to humans and the environment in the event that a fire does occur.

EPA believes that isolation procedures for all PCB Transformers in or near buildings are necessary in addition to the removal of stored combustibles and the installation of additional electrical protective devices on higher risk transformers (those with higher secondary voltages), because: (1) Electrical protective devices are subject to malfunction; (2) fires may occur in other nearby electrical equipment or machinery and involve the transformer; and (3) even in documented instances where electrical protective devices worked and rapidly deenergized a tranformer with a higher secondary voltage, sufficient heat was generated to result in the rupturing of the transformer and the volatilization and distribution of PCBs.

EPA believes that the registration of all PCB Transformers in or near buildings with building owners and local fire department jurisdictions, and the labeling of the exterior of PCB Transformer locations with PCB identification labels would reduce exposures to emergency reponse personnel and building occupants in the event of a PCB Transformer fire. This is a relatively inexpensive means for reducing exposures to emergency response personnel and building occupants, both during the extinguishing of the fire, and during cleanup operations and reoccupancy. EPA believes that registration of these transformers alone, without external labeling, may not be sufficient to insure that emergency response personnel at the scene of a transformer fire are aware that a PCB Transformer is involved. EPA encourages building owners to transmit information on the location of PCB Transformers in their buildings to the property managers responsible for overseeing the day-to-day operation of these buildings.

EPA also believes that it is prudent to require the reporting of all PCB Transformer fire-related incidents to the NSC prior to the initiation of clean-up efforts. EPA regional offices will be notified by the NSC, allowing EPA the opportunity to monitor cleanup operations and releases to the environment.

While EPA believes that requiring the containment of potential releases to water as soon as practically possible and the reporting of incidents to the NSC will reduce potential releases to waterways, EPA remains concerned about releases which may occur before it is practically possible to contain the PCBs, and potentially PCDFs, and PCDDs. EPA is soliciting comments on the practicality, feasibility, effectiveness, and cost of requiring floor drain closure in PCB Transformer locations.

EPA recognizes that the installation of additional electrical protective devices on PCB Transformers (in or near buildings) with high secondary voltages, and the isolation of PCB Transformers located in or near buildings may not be able to be accomplished immediately. PCB Transformer owners will have to: (1) Identify transformers with high secondary voltages; (2) evaluate the location of each PCB Transformer relative to the presence of building ventilation equipment, ductwork, and openings in construction; (3) determine the most cost-effective techniques; and (4) reach an agreement with the building owner for the scheduling of and financial responsibility for isolating the transformer. EPA believes that it is reasonable to allow 3 to 5 years for the installation of additional electrical protection on PCB Transformers with high secondary voltages and the isolation of all PCB Transformers in or near buildings.

At the same time, EPA also believes that it is reasonable to require certain immediate measures, namely: (1) the removal of stored combustibles from PCB Transformer locations in or near buildings; (2) the registration of all PCB Transformers with local fire department jurisdictions and with building owners; and (3) the reporting of all PCB Transformer fire-related incidents to the NRC; (4) the labeling of the exterior of PCB Transformer locations with PCB identification labels; and, (5) the

containment of all potential water releases from PCB Transformer fires.

The installation of additional electrical protection on PCB Transformers with high secondary voltages and the isolation of all PCB Transformers over a 3-year period, in combination with the immediate removal of combustibles, the reporting of fires to the NRC, the containment of water releases, and the exterior labeling and registration of these transformers is expected to avoid about 38 serious PCB Transformer fires. A 5-year period for instituting this program is expected to avoid about 31 serious PCB-Transformer fires.

The total real resource costs associated with the installation of additional electrical protection on nonsubstation PCB Transformers with high secondary voltages and the isolation of all PCB Transformers in or near buildings over a 3-year period is estimated at $536–$606 million (depending upon the type of electrical protection used). After considering the expected savings in cleanup costs from avoided serious incidents, EPA estimates the total net cost at $268–$338 million. The total resource costs associated with a 5-year electrical protection/isolation program is estimaged as $490-$560 million. After considering the expected savings in cleanup costs from avoided serious incidents, EPA estimates the net cost at $247–$317 million.

The regulatory program that avoids the maximum number of serious PCB Transformer fires for the least cost, i.e., the most cost-effective option, is: (1) The installation of additional electrical protection on PCB Transformers (with high secondary voltages) which are located in or near buildings and the isolation of all PCB Transformers in or near buildings by July 1, 1988; (2) the immediate registration of PCB Transformers with local fire department jurisdictions and the registration of PCB Transformers in or near buildings with building owners; (3) the immediate labeling of the exterior of PCB Transformer locations; (4) the immediate removal of stored combustibles from PCB Transformer locations in or near buildings; (5) the reporting of fires to the NSC; and, (6) the containment of water releases from PCB Transformer fires. This program is anticipated to avoid 38 serious fire incidents at a net cost of between $268 and $338 million. EPA's risk evaluation supports a finding that the implementation of these risk reduction measues will substantially reduce the risks posed by fires involving PCB Transformers.

The following table summarizes the cost-effectiveness of various regulatory alternatives for PCB Transformers in or near buildings.

TABLE 2.—COST-EFFECTIVENESS ANALYSIS OF ALTERNATIVES FOR PCB TRANSFORMERS IN OR NEAR BUILDINGS

Reg. option	Real costs (millions of dollars)	Net costs (millions of dollars)	Avoided serious incidents
Phaseout	$277–$1,529	$229–$1,206	14 to 40.
Retrofill	1,600	1,600	Reduces exposures.
Isolation	444–500	201–222	31–38 (if used in conjunction with electrical protection.
Electrical protection (high secondary voltages only).	36–106	36–106	Reduces amount of contaminants formed.
Regist. & labeling.	10	10	Reduces exposures.

2. Use of PCB Transformers in Outdoor Locations

EPA's evaluation of the risks posed by PCB Transformer fires indicates that the use of PCB Transformers in outdoor locations away from commercial and residential areas poses less risk to public health than the use of this equipment in or near buildings. First, comments suggest that the combustion conditions in outdoor locations may not be so conducive to the volatilization of PCBs and the formation of incomplete combustion products as combustion conditions in areas such as sidewalk vaults and machinery rooms.

Second, EPA believes that fewer people are generally present near outdoor PCB Transformer locations, and, that these areas are generally fenced in to restrict access to authorized personnel. Further, if PCBs were volatilized and dispersed into the environment, individual human exposures to PCBs and potential oxidation products from such a fire are expected to be much lower than from fires in or near buildings.

EPA does believe, however, that it is prudent to require outdoor PCB Transformers to be registered with local fire department jurisdictions and that all PCB Transformer fire-related incidents be reported to the NRC. Further, additional labeling of the exterior of these locations would reduce exposures of emergency response personnel to spilled PCBs (which is anticipated to be the more prevalent situation in outdoor locations) and may serve to limit the spread of these materials into the environment.

3. Use of PCB-Contaminated Transformers

The risks posed by fires involving PCB-Contaminated transformers are smaller than the risks posed by fires involving PCB Transformers, by virtue of the smaller amount of PCBs present in contaminated equipment. EPA evaluated the reasonable worst-case risks posed by fires involving PCB-Contaminated transformers by assessing expected human exposures to PCBs and products of incomplete combustion from a fire involving this equipment, in which smoke and soot containing these materials were distributed throughout a building.

Based on its analysis, EPA determined that while fires involving this equipment pose some level of risk, the risks are considerably less than those posed by similar fires involving PCB Transformers. Further, there are an estimated 20 million PCB-Contaminated transformers in use or in storage for reuse. Even the least costly regulatory option which was considered for PCB Transformers (registration and additional labeling), would place tremendous burdens on owners of PCB-Contaminated equipment, and could affect the availability of electrical power in the United States.

VII. Findings on the Use of PCBs in Electrical Transformers

1. Based on the analysis presented in Unit VI, EPA has determined that the use of PCBs in transformers does not pose unreasonable risks to public health or the environment, provided, that in addition to the inspection, recordkeeping, and servicing requirements of the August 25, 1982 Electrical Equipment Rule:

a. All PCB Transformers are registered with local fire department jurisdictions and PCB Transformers in or near buildings are also registered with building owners.

b. The vault door, machinery room door, or means of access to PCB Transformers are labeled with PCB identification labels.

c. The vault, machinery room, or equipment room housing PCB Transformers located in or near buildings is cleared of stored combustibles.

d. In the event of a PCB Transformer fire, measures are taken to contain water releases.

e. In the event of a PCB Transformer fire, the National Spill Response Center is notified prior to the initiation of cleanup efforts.

f. By July 1, 1988, PCB Transformers used in higher secondary voltage systems (480/277 volt systems) located in or near buildings are equiped with either: (1) Heat-sensitive (infrared) disconnect switches on the secondary circuit; (2) external secondary disconnect switches; or (3) equivalent technological innovations to insure that a transformer in high secondary voltage systems (480/277 volt systems) can be rapidly deenergized.

g. By July 1, 1988, PCB Transformers in or near buildings are isolated from building ventilation systems, building ductwork, and opening in construction to insure that smoke from a fire involving a PCB Transformer will not enter areas of high human occupancy.

2. The use of PCBs in transformers that comply with: (1) The inspection, recordkeeping, and servicing requirements of the August 25, 1982 Electrical Use Rule; and (2) the fire hazard risk reduction measures described above, does not pose unreasonable risks to public health or the environment for the following reasons:

a. If EPA did not authorize the use of PCBs in transformers, it would cost the public and United States industry billions of dollars, primarily as a result of the disruption of electrical service. The resulting reductions in risk, after considering both the risks posed by spills and leaks of PCBs as well as the risks posed by fires involving this equipment would not outweigh these substantial costs.

b. The required inspection, maintenance, and servicing requirements under the August 25, 1982 Electrical Use Rule, and the fire hazard risk reduction measures listed above reasonably reduce the exposures associated with the use of PCBs in PCB Transformers. The fire hazard risk reduction measures are much less costly than a ban on the use of PCBs in PCB Transformers but are of a similar effectiveness in reducing the risks posed by fires involving PCB Transformers.

c. The costs of phaseout and retrofilling are not reasonable when considering the potential reduction in release of PCBs and the reduction in the frequency of serious PCB Transformer fires, if these measures were required for all PCB Transformers.

d. Releases of PCBs to the environment and exposures to humans and biota from the use of PCB-Contaminated and non-PCB transformers are minimal. Further, the risks posed by fires involving this equipment are substantially less than the risks posed by fires involving PCB Transformers, and the costs of any control measures to further reduce these risks are very high.

VIII. Compliance and Enforcement

EPA, in requiring the installation of additional electrical protection on PCB Transformers with high secondary voltages, and in requiring the isolation of PCB Transformers, has allowed for some flexibility on the part of transformer owners. EPA recognizes that technology is constantly evolving in areas such as the development of electrical protection devices. Further, EPA recognizes that there may be many ways that the spread of smoke from a particular PCB Transformer location can be effectively reduced and limited to areas of low human occupancy. Thus, EPA has allowed some flexibility on the part of transformer owner in the selection of appropriate additional electrical protective devices and in the selection of appropriate isolation techniques. By requiring electrical protection/isolation, EPA implicitly allows the replacement of PCB Transformers with substitute equipment, and the retrofilling of PCB Transformers to PCB-Contaminated or non-PCB status.

If comments submitted in response to this proposed rule suggest that EPA should reduce the degree of flexibility present in the proposed isolation and electrical protection requirements, EPA will consider issuing more specific requirements in the form of either numerical or narrative performance standards. For example, EPA may consider requiring that external secondary disconnect switches be placed a specific number of feet away from the transformer. EPA is soliciting comments on the need for the development of more specific performance standards for transformer isolation and increased electrical protection.

EPA has listed heat sensitive (infrared) remote arc fault detection devices and external secondary circuit disconnect switches as options for increased electrical protection. EPA has also allowed PCB Transformer owners the option of utilizing equivalent technology to reach the same goal; that is, to insure that a PCB Transformer in a high secondary voltage system can be rapidly deenergized in the event of a fault.

The requirement for transformer isolation requires PCB Transformers to be isolated from building ventilation equipment, ductwork, and openings in construction in accordance with EPA's "Guidelines for the Preparation and Implementation of a PCB-Smoke Spread Control Plan (PCB–SSRP)". The objective of the PCB–SSRP is to reduce widespread structure and environmental contamination by smoke and soot evolved from a fire involving a PCB Transformer. These guidelines require PCB Transformer owners to evaluate the transformer location, identify pathways of smoke travel, and prepare and implement a plan for blocking contamination pathways. Whithin the context of isolation procedures, the guidelines also require a consideration of the effect that isolation has on equipment cooling, and requires the provision of alternative cooling when necessary.

Like the Guidelines for the Preparation and Implementation of a Spill Prevention Control and Countermeasure Plan (SPCC) (40 CFR 112.7) under Office of Water regulations, the guidelines for the Preparation and Implementation of a PCB-Smoke Spread Control Reduction Plan (PCB–SSRP) allow some flexibility in selecting the most appropriate mechanism(s) for isolating a specific PCB Transformer. Various alternatives that are acceptable to EPA are listed in these guidelines. Further, the guidelines explicitly allow the planning and implementation of equivalent methods that are not listed in the guidelines.

To facilitate EPA compliance monitoring efforts, EPA is proposing to require PCB Transformer owners to maintain written PCB-SSRPs. EPA is proposing that these plans be retained until the transformer is placed into storage for disposal, or until the transformer is disposed (whichever occurs first). Alternatively, EPA is soliciting comments on the costs and benefits of requiring the submittal of PCB-SSRPs to EPA.

EPA is soliciting comments on the need for PCB Transformer owners to retain records documenting their compliance with the registration program required under this proposed rule. EPA believes that the retention of these records by PCB Transformer owners would facilitate monitoring compliance with the registration requirements.

IX. Judicial Review

When this rule is promulgated, judicial review may be available under section 19 of TSCA in the United States Court of Appeals for the District of Columbia Circuit or for the circuit in which the person seeking review resides or has its principal place of business. To provide all interested persons an equal opportunity to file a timely petition for judicial review and to avoid so called "races to the courthouse," EPA intends to promulgate this rule for purposes of

judicial review two weeks after publishing the final rule in the **Federal Register**. The effective date will be calculated from the promulgation date.

X. Official Record of Rulemaking

A. Previous Rulemaking Records

(1) Official rulemaking record from "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce and Use Prohibition Rule" published in the **Federal Register** of May 31, 1979, (44 FR 31514).

(2) Official rulemaking record from "Polychlorinated Biphenyls (PCBs); Disposal and Marking Final Regulation" published in the **Federal Register** of February 17, 1978, (43 FR 7150).

(3) Official rulemaking record from "Polychlorinated Biphenyls (PCBs); Manufacture, Processing, Distribution, and Use in Closed and Controlled Waste Manufacturing Processes" published in the **Federal Register** of October 21, 1982, (47 FR 46980).

(4) Official rulemaking record from "Polychlorinated Biphenyls (PCBs); Manufacturing, Processing, Distribution in Commerce and Use Prohibitions; Use in Electrical Equipment" published in the **Federal Register** of August 25, 1982, (47 FR 37342).

(5) Official record from "Polychlorinated Biphenyls (PCBs); Manufacturing, Processing, Distribution in Commerce and Use Prohibitions; Use in Electrical Transformers" Advance Notice of proposed Rulemaking, published in the **Federal Register** of March 23, 1984, (49 FR 11070).

B. Support Documents

(1) USEPA, OPTS, EED, Versar, Inc., "Exposure Assessment for Polychlorinated Biphenyls (PCBs), Polychlorinated Dibenzofurans (PCDFs), and Polychlorinated Dibenzodioxins (PCDDs) Released During Transformer Fires" (September 1984).

(2) USEPA, OPTS, HERD, "HERD Work for Proposed Polychlorinated Biphenyl (PCB) Transformer Fires Rulemaking" (October 1, 1984).

(3) USEPA, OPTS, HERD, "Response to Comments on Health Effects of PCBs Submitted by the Chemical Manufacturers Association and the Edison Electric Institute" (August 19, 1982).

(4) USEPA, OW, "Ambient Water Quality Criteria for 2,3,7,8-Tetrachlorodibenzo-p-dioxin" (February 1984).

(5) USEPA, ORD, OHEA, ECAO, "(DRAFT) Health Assessment Document for polychlorinated Dibenzo-p-dioxins" (May 1984).

(6) USEPA, OPTS, ETD, Putnam, Hayes and Bartlett, Inc. "Regulatory Impact Analysis of the Proposed Rule for Indoor PCB-Transformers" (September 1984).

(7) Kimbrough, Renate, D., *et al* "Health Implications of 2,3,7,8-Tetrachlorodibenzodioxin (TCDD) Contamination of Residential Soil," Journal of Toxicology and Environmental Health (in press).

(8) USEPA, OPTS, EED, "NFIRS Data for 1982" (April 1984).

(9) USEPA, OPTS, "Guidelines for the Preparation and Implemention of PCB-Smoke Spread Reduction Plan (PCB-SSRP)" (September 1984).

XI. Executive Order 12291

Under Executive Order 12291, issued February 17, 1981, EPA must judge whether a rule is a "major rule" and, therefore, subject to the requirement that a Regulatory Impact Analysis be prepared. EPA has determined that this amendment to the PCB rule is a major rule as the term is defined in section 1(b) of the Executive Order.

EPA has concluded that the amendment is "major" under the criteria of section 1 (b). The annual effect of the rule on the economy will be over $100 million. However, the regulation does allow uses of PCBs in electrical transformers to continue that would otherwise be prohibited by section 6(e) of TSCA. This rule avoids the severe disruption of electric service to the public and industry that would occur if the use of this equipment were prohibited. It also avoids the economic impact that would result from a requirement to replace the equipment as soon as possible.

Because this proposed rule is a major rule, EPA has prepared a Regulatory Impact Analysis using the guidance in the Executive Order. This proposed rule was submitted to the Office of Management and Budget (OMB) prior to publication, as required by the Executive Order.

XII. Regulatory Flexibility Act

Under section 605(b) of the Regulatory Flexibility Act, 5 U.S.C. 605(b), the Administrator may certify that a rule will not, if promulgated have a significant impact on a substantial number of small entities and, therefore, does not require a regulatory flexibility analysis.

This effect of this proposed rule, if promulgated, is to avoid severe disruption of electric service to industry and the public, and to reduce the costs associated with complying with TSCA. In general, this rule will reduce the burden on small businesses that would otherwise be encountered if an immediate ban on PCB-containing transformers were to take effect. If an immediate ban on the use of PCBs in transformers were imposed, large costs would be incurred by all producers and users of electricity, including small businesses.

I certify that this proposed rule, if promulgated, will not have a significant economic impact on a substantial number of small entities.

XIII. Paperwork Reduction Act

The Paperwork Reduction Act of 1980 (PRA), 44 U.S.C. 3501 *et seq.* authorizes the Director of OMB to review certain information collection requests by Federal agencies. EPA has determined that the recordkeeping and reporting requirements of this proposed rule constitute a "collection of information" as defined in 44 U.S.C. 3502(4). The information collection requirements of this proposed rule have been submitted to the Office of Management and Budget (OMB) under the Paperwork Reduction Act of 1980. Comments on these requirements should be submitted to the Office of Information and Regulatory Affairs of OMB, marked ATTENTION: Desk Officer for EPA. The final rule package will respond to any OMB or public comments on the information collection requirements.

(15 U.S.C. 2605)

List of Subjects in 40 CFR Part 761

Hazardous materials, Labeling, Polychlorinated biphenyls, Recordkeeping and reporting requirements, Environmental protection.

Dated: September 28, 1984.

William D. Ruckelshaus,

Administrator.

Therefore, it is proposed that 40 CFR Part 761 be amended as follows:

1. In § 761.30, the introductory text of paragraph (a) and paragraph (a)(1) are revised to read as follows:

§ 761.30 Authorizations.

* * * * *

(a) *Use in and servicing of transformers (other than railroad transformers).* PCBs, at any concentration may be used in transformers (other than railroad locomotives and self-propelled railroad cars) and may be used for purposes of servicing railroad cars) and may be used for purposes of servicing including rebuilding these transformers for the remainder of their useful lives, subject to the following conditions:

(1) *Use conditions.* (i) After October 1 1985, the use and storage for reuse of

PCB Transformers that pose an exposure risk to food or feed is prohibited.

(ii) After July 1, 1988, PCB Transformers in high secondary voltage systems (480/277 volt systems), located in or near buildings, must be equipped with either:

(A) Heat-sensitive (infrared) automatic disconnect switches on the secondary circuit,

(B) External secondary disconnect switches (external means outside of the transformer vault or enclosure), or

(C) Equivalent technology to insure that the secondary side of a PCB Transformer with a high secondary voltage can be rapidly deenergized after a fault.

(iii) After July 1, 1988, PCB Transformers in or near buildings must be isolated from building ventilation equipment, building ductwork, and openings in construction in accordance with EPA's Guidelines for the Preparation and Implementation of a PCB-Smoke Spread Reduction Plan (PCB–SSRP). The objective of isolation (and the development of the PCB–SSRP) is to effectively reduce widespread structure and environmental contamination by smoke and soot from a fire involving a PCB Transformer. PCB Transformer owners must:

(A) Identify all pathways through which smoke from a PCB Transformer fire would be reasonably expected to travel.

(B) Block all contamination pathways identified above, in accordance with EPA Guidelines for the Preparation and Implementation of a PCB–SSRP.

(C) Determine the need for alternative equipment cooling.

(iv) After October 1, 1985, all PCB Transformers must be registered with appropriate local fire department jurisdictions (i.e., with the fire department which is likely to respond to the fire). Information required to be provided to the local fire department jurisdiction by the PCB Transformer owner includes:

(A) The address(es) of the buildings(s) that the PCB Transformer(s) serves.

(B) The location of the transformer(s) in or near the building.

(C) The principal constituent of the dielectric fluid in the transformer(s) (i.e., PCB/mineral oil/silicone oil).

(D) The name and telephone number of the person to contact in the event of a fire involving the equipment.

(v) After October 1, 1985, all PCB Transformers serving buildings must be registered with the owner(s) of the building(s) that the transformer(s) serves. Information required to be provided to the building owner by the PCB Transformer owner includes:

(A) The location of the transformer(s) serving the building(s).

(B) The principal constituent of the dielectric fluid in the transformer(s) (i.e., PCB/mineral oil/silicone oil).

(vi) After October 1, 1985, combustible materials, including but not limited to paints, solvents, plastics, paper, and sawn wood must not be stored in the same area as a PCB Transformer.

(vii) A visual inspection of each PCB Transformer (as defined in § 761.3(y)) in use or stored for reuse shall be performed at least once every 3 months. These inspections may take place any time during the 3-month periods: January–March, April–June, July–September, and October–December as long as there is a minimum of 30 days between inspections. The visual inspection must include investigation for any leak of dielectric fluid on or around the transformer. The extent of the visual inspections will depend on the physical constraints of each transformer installation and should not require an electrical shutdown of the transformer being inspected.

(viii) If a PCB Transformer is found to have a leak which results in any quantity of PCBs running off or about to run off the external surface of the transformer, then the transformer must be repaired or replaced to eliminate the source of the leak. In all cases any leaking material must be cleaned up and properly disposed of according to disposal requirements of § 761.60. Cleanup of the released PCBs must be initiated as soon as possible, but in no case later than 48 hours of its discovery. Until appropriate action is completed, any active leak of PCBs must be contained to prevent exposure of humans or the environment and inspected daily to verify contamination of the leak. Trenches, dikes, buckets, and pans are examples of proper containment measures.

(ix) If a PCB Transformer is involved in a fire-related incident, the owner of the transformer is responsible for reporting the incident to the National Spill Response Center prior to the initiation of any cleanup efforts. A fire-related incident is defined as an incident involving a PCB Transformer in which sufficient heat is generated by any source to result in the rupturing of the transformer casing and the release of PCBs. The owner is also responsible for taking immediate measures to contain and control any potential releases to water. These measures include, but are not limited to:

(A) The blocking of floor drains.

(B) The containment of water runoff.

(x) Records of inspection and maintenance history shall be maintained at least 3 years after disposing of the transformer and shall be made available for inspection, upon request by EPA (OMB Control Number: 2070–0003). Such records shall contain the following information for each PCB Transformer:

(A) Its location.

(B) The date of each visual inspection and the date that leak was discovered, if different from the inspection date.

(C) The person performing the inspection.

(D) The location of any leak(s).

(E) An estimate of the amount of dielectric fluid released from any leak.

(F) The date of any cleanup, containment, repair, or replacement.

(G) A description of any cleanup, containment, or repair performed.

(H) The results of any containment and daily inspection required for uncorrected active leaks.

(xi) A reduced visual inspection frequency of at least once every 12 months applies to PCB Transformers that utilize either of the following risk reduction measures. These inspections may take place any time during the calendar year as long as there is a minimum of 180 days between inspections.

(A) A PCB Transformer which has impervious, undrained, secondary containment capacity of at least 100 percent of the total dielectric fluid volume of all transformers so contained or

(B) A PCB Transformer which has been tested and found to contain less than 60,000 ppm PCBs (after three months of inservice use of the transformer has been serviced for purposes of reducing the PCB concentration).

(xii) An increased visual inspection frequency of at least once every week applies to any PBC Transformer in use or stored for reuse which poses an exposure risk to food or feed is responsible for the inspection, recordkeeping, and maintenance requirements under this section until the user notifies the owner that the transformer may pose an exposure risk to food or feed. Following such notification, it is the owner's ultimate responsibility to determine whether the PCB Transformer poses an exposure risk to food or feed.

(xiii) A written PCB-Smoke Spread Reduction Plan (PCB-SSRP), prepared in accordance with EPA guidelines, shall be developed for each PCB Transformer location in or near buildings by July 1, 1988 and shall be maintained until the date the transformer(s) is placed into

storage for disposal or until the transformer(s) is disposed (whichever occurs first) and shall be made available for inspection, upon request, by EPA.

* * * * *

(The information collection requirements contained in paragraph (a)(1)(x) were approved by the Office of Management and Budget under Control Number 2070–0003)

2. In § 761.40, paragraph (j) is added to read as follows:

§ 761.40 Marking requirements.

* * * * *

(j) As of October 1, 1985, the vault door, machinery room door, fence, sidewalk grate, or means of access to a PBC Transformer must be marked with the mark, M_L. The mark must be placed so that it can be easily read by firemen fighting a fire involving this equipment.

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