INSPECTION PROCEDURE 83524

EXTERNAL OCCUPATIONAL EXPOSURE CONTROL AND PERSONAL DOSIMETRY (PREOPERATIONAL AND SUPPLEMENTAL)

PROGRAM APPLICABILITY: 2513, 2515, and 2525

83524-01 INSPECTION OBJECTIVES

01.01 To determine whether the applicant will be able to effectively control external occupational exposure and has adequate personal dosimetry for external exposure during normal operation.

01.02 To determine the adequacy of the licensee's personal dosimetry and capability to effectively control the external exposure of onsite workers during emergency operations.

83524-02 INSPECTION REQUIREMENTS

02.01 Physical Controls. Determine whether radiation protection facility design features and shielding meet requirements and FSAR commitments.

02.02 Administrative Controls

a. Determine whether administrative measures for controlling access and stay times in radiation areas during normal operations meet requirements and FSAR commitments.

b. Determine whether administrative measures to implement external exposure controls during emergency operations are adequate, and whether they satisfy licensee commitments.

02.03 Personal Dosimetry

a. Determine whether personal dosimetry equipment and procedures for normal operations meet regulatory requirements and FSAR commitments.

b. Determine whether personal dosimetry equipment and procedures for emergency operations meet regulatory requirements and FSAR commitments.

83524-03 INSPECTION GUIDANCE

03.01 Physical Controls. Determine by direct observation and discussions with cognizant individuals whether selected design features are as described in the

FSAR and whether provisions for use of temporary shielding are adequate for normal and emergency operations.

03.02 Administrative Controls

a. Aspects of administrative controls that may be examined include:

1. Radiation Work Permit (RWP) Program.

2. Controlling access to high exposure areas.

3. Use of control/action levels, including administrative limits on exposure.

4. Adequacy of written procedures for external exposure control.

b. In addition to those factors specified in 03.02a, above, consider the following for emergency operations:

1. Provisions for 24-hour-per-day coverage by individuals who have the authority to authorize exposures in excess of 10 CFR 20 limits.

2. Criteria established to exceed 10 CFR 20 limits.

3. Consistency of site emergency exposure limits with Environmental Protection Agency (EPA) emergency worker and lifesaving protective action guidelines (25 rems whole body for corrective actions; 75 rems whole body for lifesaving activities).

4. Adequacy of provisions for contractor or other persons/agencies augmenting the onsite emergency organization. These may include, but are not limited to contractor HP technicians, local fire departments and rescue squads, INPO representatives, and NSSS vendors.

5. Adequacy of provisions for controlling exposures of security personnel.

03.03 Personal Dosimetry

a. Aspects of personal dosimetry that may be examined include:

1. Adequacy of written procedures and methods for converting raw data to dose.

2. Quality assurance for dosimeter processing.

3. Provisions for timely measurements, recording and dissemination of current dose data; accurate recording of prior dose on NRC Form 4.

4. Provisions for preventing tampering with dosimeters, for preventing use of a dosimeter by other than the individual to which it is assigned, and for investigating loss of, or damage to, dosimeters.

5. Photon, beta, and neutron exposure.

6. Dosimeter selection and placement: Adequacy of criteria for utilization and placement of whole-body and extremity dosimeters, including use in non-uniform radiation fields. (See IE Information Notice Nos. 83-59, 81-26, Part 3, and Supplement No. 1, 83-59, and INPO 82-001-OEN-04.

7. Provisions for special processing of dosimetry devices.

8. Use of pocket dosimeters and comparison of their measurements with TLD or film badge results, and quality assurance and performance testing.

b. Review procedures and selected records, hold discussions with cognizant individuals and observe representative samples of equipment; for example, equipment in emergency kits, in the Operational Support Center, or in the Technical Support Center. In addition to the applicable factors specified in 03.03a, above, consider the following:

1. Accessibility of supplies of direct reading dosimeters and readers under accident conditions.

2. Measurement range of direct reading dosimeters. (Measurement ranges should be commensurate with anticipated emergency functions. 200 R is normally acceptable as the upper limit of measurement range.)

3. Accessibility of indirect reading dosimeters (TLD or film badges) under accident conditions.

4. Measurement range of TLD's or film badges. (Measurement ranges should be commensurate with anticipated emergency functions. 1,000 R is normally acceptable as the upper limit of measurement range.)

83524-04 REFERENCES

Standard Review Plan Section 12.5, "Operational Radiation Protection Program," NUREG-0800.

Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors."

Regulatory Guide 8.2, "Guide for Administrative Practices in Radiation Monitoring" (endorses ANSI N13.2-1969).

Regulatory Guide 8.3, "Film Badge Performance Criteria" (endorses ANSI N13.7-1972).

Regulatory Guide 8.4, "Direct-Reading and Indirect-Reading Pocket Dosimeters" (endorses ANSI N13.5-1972)

Regulatory Guide 8.7, "Occupational Radiation Exposure Records Systems" (endorses ANSI N13.6-1966 (R 1972)).

Regulatory Guide 8.8, "Information Relevant to Ensuring That Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable (ALARA)."

Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures As Low As Is Reasonably Achievable."
Regulatory Guide 8.14, "Personnel Neutron Dosimeters."

Regulatory Guide 8.28, "Audible-Alarm Dosimeter."

NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," November 1980.

NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980.

NUREG-0761, "Radiation Protection Plans for Nuclear Power Reactor Licensees" (Draft Report for Comment), Chapter 5, "Dose Control," March 1981.

NUREG/CR-1769, "Neutron Dosimetry at Commercial Nuclear Plants," May 1981.

NUREG/CR-2524, "Evaluation of Personnel Neutron Dosimetry at Operating Nuclear Power Plants," March 1983.

NUREG/CR-2956, (PNL-4471), "Neutron Dosimetry at Commercial Nuclear Plants," March 1983.

ANSI N13.5-1972 (R1982), "Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation."

ANSI N13.6-1966 (R1972), "Practice for Occupational Records Systems."

ANSI N13.7-1983, "Photographic Film Dosimeters - Criteria for Performance" (Revision of N13.7-1972).

ANSI N13.11-1983, "Criteria for Testing Personnel Dosimetry Performance."

ANSI N13.15-1981, "Performance of Personnel Thermoluminescence Dosimetry Systems."

ANSI N13.27-1981, "Performance Requirements for Pocket-sized Alarm Dosimeters and Alarm Ratemeters."

ANSI N319-1976, "American National Standard for Personnel Neutron Dosimeters (Neutron Energies less than 29 MeV)."

ANSI N322-1975, "Inspection and Test Specifications for Direct and Indirect Reading Quartz Fiber Pocket Dosimeters."

INPO Good Practice 82-001-EPN-02, "Conduct of a Direct Reading Dosimeter Program (Quartz Fiber Pocket Dosimeters)," September 1982.

INPO Good Practice 82-001-EPN-03, "Comparison of Dosimetry Results," September 1982.

INPO Good Practice 82-001-OEN-03, "Dosimetry Placement for Steam Generator Workers," January 1982.

INPO Good Practice 82-001-OEN-04, "Personnel Protection from Beta Particles," January 1982.

NRCP Report No. 39, "Basic Radiation Protection Criteria," January 15, 1971.

NRCP Report No. 57, "Instrumentation and Monitoring Methods for Radiation Protection," May 1, 1978.

FEMA-REP-2, "Guidelines on Offsite Emergency Radiation Measurements, Phase 1 - Airborne Release," Federal Emergency Management Agency, September 1980.

IE Information Notice No. 81-26, Part 2, "Placement of Personnel Monitoring Devices for External Radiation Exposure," August 28, 1981 and Supplement 1, July 19, 1982.

IE Information Notice No. 83-59, "Dose Assignment for Workers in Non-Uniform Radiation Fields," September 15, 1983.

END