U.S. NUCLEAR REGULATORY COMMISSION

STANDARD REVIEW PLAN

OFFICE OF NUCLEAR REACTOR REGULATION

12.5 OPERATIONAL RADIATION PROTECTION PROGRAM

REVIEW RESPONSIBILITIES

Primary - Organization responsible for the review of health physics issues.

Secondary - None

I. AREAS OF REVIEW

The following areas of the applicant's safety analysis report (SAR) are reviewed, as they relate to the operational aspects of the radiation protection program:

A. Organization

1. The administrative organization of the radiation protection program, including the authority and responsibility of each position identified (preliminary safety analysis report (PSAR), update in the final safety analysis report (FSAR) or the combined license application).

2. The experience and qualifications of the personnel responsible for various aspects of the radiation protection program and for handling and monitoring radioactive material. Reference may be made to SAR Chapter 13 as appropriate (FSAR or combined license application).

3. Information describing the implementation of Regulatory Guides 1.8, 8.2, 8.8, and 8.10. Information describing any proposed alternatives (PSAR and update in FSAR, or combined license application).

4. Review of qualifications, experience, and organization related to the operational radiation protection program. This review is coordinated with the general review of staffing and qualifications in SRP Chapter 13.

5. The authority and responsibility of the management and staff for implementation and documentation of radiation program reviews required by 10 CFR 20.1101 and 20.2102 (PSAR and update in FSAR, or the combined license application).

B. Equipment, Instrumentation, and Facilities

1. The criteria for selecting portable and laboratory technical equipment and instrumentation for performing radiation and contamination surveys, for in plant airborne radioactivity monitoring and sampling, for area radiation monitoring, and for personnel monitoring (including audible alarming, electronic dosimeters) for normal operation, anticipated operational occurrences and accident conditions (PSAR and update in FSAR, design certification application, or combined license application). Include the quantity of each type of instrument, taking into consideration that some instruments will be unavailable during calibration, maintenance, and repair.

2. The description of instrument storage, calibration, and maintenance facilities (PSAR and update in FSAR, design certification application, or combined license application).

3. The description and location of the radiation protection facilities (including locker and shower rooms, personnel decontamination area, respiratory protective equipment, "hot" machine shop and repair facilities, use of close-capture filtration devices, and other contamination control equipment and areas) and information describing how such facilities and services will allow male and female workers to receive the necessary protection against radioactive contamination (PSAR and update in FSAR, design certification application, or combined license application).

4. The location of items in B1, 2, and 3 above and the description of types of detectors and monitors, sensitivity, range, frequency, alarms, and recordkeeping, and methods of calibration (FSAR, design certification application, or combined license application).

5. Information describing the implementation of the equipment and facilities included in Regulatory Guides 1.97, 8.4, 8.6, 8.8, 8.9, 8.15, 8.20, 8.26, and 8.28. Information describing any proposed alternatives (FSAR, design certification application, or combined license application).

C. Procedures

1. The description of physical and administrative measures for controlling access to and work within radiation areas, high radiation areas and very high radiation areas (FSAR or combined license application).

2. The description of procedures governing the accountability and storage of radioactive sources not fixed to, or installed in, plant systems (PSAR and update in FSAR, or combined license application).

3. The description of procedures and methods of operation for assuring that occupational radiation exposure (ORE) will be as low as is reasonably achievable (ALARA), especially procedures used in refueling, inservice inspections, radwaste handling, spent fuel handling, loading and shipping, normal operation, routine maintenance, and sampling and calibration that are specifically related to radiation safety (FSAR or combined license application).

4. The description of methods, frequencies, and procedures for conducting radiation surveys (FSAR or combined license application).

5. The description of the bases and methods for monitoring and control of surface contamination (including loose discrete radioactive particles) for personnel and equipment, including the surveillance program to ensure that licensed materials will not be inadvertently released from the controlled area (FSAR or combined license application).

6. The description of engineering controls to limit airborne radioactivity, and of methods and procedures for evaluating and controlling potential airborne radioactivity concentrations, special air sampling, and issuance and use of respiratory equipment (FSAR or combined license application).

7. The description of radiation protection training and retraining programs (FSAR or combined license application).

8. Information describing the implementation of Regulatory Guides 1.8, 1.39, 8.2, 8.7, 8.8, 8.9, 8.10, 8.13, 8.15, 8.20, 8.25, 8.26, 8.27, 8.29, 8.32, 8.34, 8.35, 8.36, and 8.38, including information describing any proposed alternatives (PSAR and update in FSAR, or combined license application).

9. The description of Quality Assurance procedures, consistent with the guidance in Regulatory Guide 1.33, to implement the applicable requirements in 10 CFR 20.1101, 10 CFR Part 50, Appendix B, and 10 CFR Part 71, Subpart H (FSAR or combined license application). This review is coordinated with the overall review of the Quality Assurance Program in SRP Chapter 17.

10. The description of procedures covering the packaging and transportation of licensed radioactive materials pursuant to the requirements of 10 CFR Part 71, § 71.5, and Subpart G, and the transfer of low level radioactive waste pursuant to the requirements of 10 CFR Part 20, Subpart K (FSAR or combined license application).

D. Program Implementation

1. The description of the implementation of the program, including staffing, equipment, facilities and procedures, with milestones tied to phases of plant construction (combined license applicants).

II. ACCEPTANCE CRITERIA

The information provided in the SAR is acceptable if it meets the requirements of 10 CFR Part 50, § 50.34, and if it contains sufficient information, so that the relevant requirements of the regulations listed below are met. The relevant requirements are:

1. 10 CFR Part 19, § 19.12 - "Instruction to workers," as it relates to workers entering restricted areas being kept informed as to the storage transfer, or use of radioactive materials or radiation in such areas, and instructed as to the risk associated with occupational radiation exposure, precautions, and procedures to reduce exposures and purpose and function of protective devices employed.

2. 10 CFR Part 20, § 20.1101, "Radiation Protection Programs," (a) as it relates to establishing and implementing a radiation protection program; (b), and the definition of ALARA in § 20.1003, as they relate to persons involved in licensed activities making every reasonable effort to maintain radiation exposures ALARA; and (c) as it relates to the review and audit of the radiation protection program content and implementation.

3. 10 CFR Part 20, § 20.1201, "Occupational dose limits for adults," as it relates to design features, shielding, ventilation, monitoring, dose assessment, and administrative controls for the purpose of controlling occupational radiation exposures to occupational workers.

4. 10 CFR Part 20, § 20.1201, "Occupational dose limits for adults," § 20.1202, "Compliance with requirements for summation of external and internal doses," § 20.1203, "Determination of external dose from airborne radioactive material," and § 20.1204, "Determination of internal exposure," as they relate to design features, ventilation, monitoring, and dose assessment, and administrative controls for the purpose of controlling intake of radioactive materials by occupational workers.

5. 10 CFR Part 20, § 20.1206, "Planned Special Exposures," and § 20.2105, "Records of planned special exposures," as they relate to the authorization and control of individuals receiving a planned special exposure.

6. 10 CFR Part 20, § 20.1207, "Occupational dose limits for minors," as it relates to control of radiation doses received by minors.

7. 10 CFR Part 20, § 20.1208, "Dose equivalent to an embryo/fetus," as it relates to control of radiation doses received by the embryo/fetus of a declared pregnant worker.

8. 10 CFR Part 20, § 20.1301, "Dose limits for individual members of the public," and § 20.1302, "Compliance with dose limits for individual members of the public," as they relate to control of radiation doses to individual members of the public and the maximum dose rate in unrestricted areas.

9. 10 CFR Part 20, § 20.1406, "Minimization of contamination," as it relates to the design and operation of the plant minimizing contamination of the facility and the environment.

10. 10 CFR Part 20, § 20.1501, "General," as it relates to performance of surveys to comply with the regulations in Part 20.

11. 10 CFR Part 20, § 20.1501(c), "General," and § 20.1502, "Conditions requiring individual monitoring of external and internal occupational dose," as they relate to requirements for providing appropriate personnel monitoring equipment to individuals who are occupationally exposed.

12. 10 CFR Part 20, § 20.1601, "Control of access to high radiation areas," § 20.1602, "Control of access to very high radiation areas," § 20.1901, "Caution signs," § 20.1902, "Posting requirements," § 20.1903, "Exceptions to posting requirements," § 20.1904, "Labeling containers," and § 20.1905, "Exemptions to labeling requirements," as they relate to posting of, and control of access to, radiation areas, high radiation areas, very high radiation areas, airborne radioactivity areas, and further indicators necessary to identify and quantify the presence of radioactive materials in an area.

13. 10 CFR Part 20, § 20.1701, "Use of process or other engineering controls," and § 20.1702, "Use of Other Controls," as they relate to the control the concentrations of, and limit the intake of, radioactive materials in the air.

14. 10 CFR Part 20, § 20.1703, "Use of individual respiratory protection equipment," as it relates to the use of respiratory protective equipment to limit the intake of radioactive material.

15. 10 CFR Part 20, § 20.1906, "Procedures for receiving and opening packages," as it relates to appropriate handling of packages containing certain quantities of radioactive materials.

16. 10 CFR Part 20, § 20.1801, "Security of stored material," as it relates to securing licensed materials against unauthorized removal from the place of storage.

17. 10 CFR Part 20, § 20.1802, "Control of material not in storage," as it relates to controlling of licensed material that is not in storage.

18. 10 CFR Part 20, § 20.2001, "General Requirements," and § 20.2006, "Transfer for disposal and manifests," as they relate to the transfer of radioactive materials and the disposal of low-level radioactive waste.

19. 10 CFR Part 20, § 20.2101, "General provisions," § 20.2102, "Records of radiation protection programs," § 20.2103 "Records of surveys," § 20.2104, "Determination of prior occupational dose," § 20.2105, "Records of planned special exposures," § 20.2106, "Records of individual monitoring results," § 20.2107 "Records of dose to individual members of the public," and § 20.2110, "Form of records," as they relate to maintaining of records or individuals who are provided with personnel monitoring equipment and who are exposed to radiation.

20. 10 CFR Part 20, § 20.2201 "Reports of theft or loss of licensed material," as it relates to reports to NRC required from licensees, immediately after becoming aware of any loss or theft of licensed material that may result in significant hazard.

21. 10 CFR Part 20, § 20.2202, "Notification of incidents," § 20.2203, "Reports of exposures, radiation levels, and concentrations of radioactive material exceeding the limits," § 20.2204, "Reports of planned special exposures," and § 20.2205, "Reports to individuals of exceeding dose limits," as they relate to requirements for written reports to NRC concerning individual exposures in excess of regulatory limits, incidents requiring notification, and levels of radiation or concentrations of radioactive materials in excess of certain values.

22. 10 CFR Part 20, § 20.2206, "Reports of individual monitoring," and 10 CFR 19.13, "Notification and reports to individuals," as they relate to requirements for informing workers of the results of their individual monitoring.

23. 10 CFR Part 50, § 50.34(f)(2)(viii), and § 50.34(f)(2)(xxvii), as they relate to monitoring of in-plant radiation and airborne radioactivity for routine and accident conditions. Refer also to NUREG-0737, Items II.B.3 and III.D.3.3, for additional detail and clarification of requirements.

24. 10 CFR Part 50, § 50.120 , "Training and Qualification of Nuclear Power Plant Personnel," as it relates to the provisions and requirements for training for radiation protection technicians.

25. 10 CFR Part 50, Appendix A, Criterion 64 - "Monitoring Radioactivity Releases," as it relates to provision of appropriate monitoring for the reactor containment atmosphere and spaces containing components for recirculation of loss-of-coolant-accident fluids.

26. 10 CFR Part 50, Appendix B, and 10 CFR Part 71, Subpart H, as they relate to Quality Assurance programs.

27. 10 CFR Part 71, § 71.5,"Transportation of Licensed Material," and Subpart G, "Operating Controls and Procedures," as they relate to the control of licensed radioactive material during packaging and transportation, and 10 CFR Part 20, Subpart K, "Waste Disposal," as they relate to the transfer of low-level radioactive materials and waste.

The following regulatory guides, NUREGs, and industry standards provide information, recommendations, and guidance, and in general describe a basis acceptable to the staff to implement the requirements of Parts 19, 20, and 50:

1. Regulatory Guide 1.8 "Qualification and Training of Personnel for Nuclear Power Plants," as it relates to compliance with the Commission's regulations with regard to qualification of nuclear power plant personnel.

2. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operational)," as it relates to compliance with the Commission's quality assurance regulatory requirements during nuclear power plant operations.

3. Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," as it relates to

compliance with the Commission's regulations to provide instrumentation to monitor plant variables and systems during and following an accident.

4. Regulatory Guide 8.2, "Guide for Administrative Practices in Radiation Monitoring," as it relates to general information on radiation monitoring programs for administrative personnel.

5. Regulatory Guide 8.4, "Direct-Reading and Indirect-Reading Pocket Dosimeters," as it relates to standards for direct-reading and indirect-reading pocket dosimeters used for personnel dose or dose rate measurements.

6. Regulatory Guide 8.6, "Standard Test Procedure for Geiger-Mueller Counters," as it relates to testing the operating characteristics of Geiger-Mueller counters prior to making calibrations and measurements.

7. Regulatory Guide 8.7, "Instructions for Recording and Reporting Occupational Radiation Exposure Data," as it relates to specification of records necessary to describe the occupational radiation exposure of individuals, and the conditions under which the exposure may occur.

8. Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as Low as is Reasonably Achievable," as it relates to meeting the requirements of 10 CFR 20.1101(b) and the definition of ALARA in § 20.1003 by providing radiation protection information pertaining to actions taken during the design, construction, operation, and decommissioning to assure that occupational radiation exposures are kept ALARA.

9. Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program," as it relates to appropriate concepts, models, equations, and assumptions to be used in determining the extent of an individual's intake of radioactive materials and resulting committed organ dose.

10. Regulatory Guide 8.10, "Operating Philosophy for Maintaining Occupational Radiation Exposures as Low as is Reasonably Achievable," as it relates to meeting the requirements of 10 CFR 20.1101(b), and the definition of ALARA in § 20.1003, concerning the commitment by the applicant's management and vigilance by the radiation protection manager and the radiation protection staff to maintain occupational radiation exposures ALARA.

11. Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure," as it relates to description of instruction to be provided concerning biological risks to embryos or fetuses, resulting from prenatal occupational radiation exposure.

12. Regulatory Guide 8.15, "Acceptable Programs for Respirator Protection," as it relates to elements of acceptable respiratory protection programs.

13. Regulatory Guide 8.20, "Application of Bioassay for I-125 and I-131," as it relates to the development and implementation of a bioassay program for any licensee handling or processing I-125 or I-131.

14. Regulatory Guide 8.25, "Air Sampling in the Workplace," as it relates to the monitoring the levels of airborne radioactivity within the facility.

15. Regulatory Guide 8.26, "Applications of Bioassay for Fission and Activation Products," as it relates to bases used by NRC staff in evaluating the need for license provisions on bioassay programs where workers may be subject to internal radiation exposure from the inhalation or ingestion of fission or neutron activation products.

16. Regulatory Guide 8.27, "Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants," as it relates to a radiation protection training and retraining program consistent with the ALARA objective and acceptable to the NRC staff for meeting the training requirement of 10 CFR Part 19.

17. Regulatory Guide 8.28, "Audible Alarm Dosimeters," as it relates to appropriate use of audible alarm dosimeters, and conditions under which they should not be relied upon to perform their intended function.

18. Regulatory Guide 8.29, "Instruction Concerning Risks from Occupational Radiation Exposure," as it relates to providing appropriate instruction on the risks associated with occupational radiation exposure to individuals who are to be exposed, acceptable to the NRC staff for meeting the training requirement of 10 CFR Part 19.

19. Regulatory Guide 8.32, "Criteria for Establishing a Tritium Bioassay Program," as it relates to monitoring individuals for exposure to tritium.

20. Regulatory Guide 8.34, "Monitoring Criteria and Methods to Calculate Occupational Radiation Doses," as it relates to criteria acceptable to the NRC staff that may be used by licensees to determine when monitoring is required, and methods acceptable to the NRC staff for calculating occupational doses when intake is known.

21. Regulatory Guide 8.35, "Planned Special Exposures," as it relates to guidance on the conditions and prerequisites for permitting planned special exposures, and allowed by 10 CFR Part 20, the associated specific monitoring and reporting requirements.

22. Regulatory Guide 8.36, "Radiation Doses to Embryo/Fetus," as it relates to determination of the total radiation dose to the embryo/fetus as the sum of the deep-dose equivalent to, and dose to the embryo/fetus from, intakes of the declared pregnant worker.

23. Regulatory Guide 8.38, "Control of Access to High and Very High Radiation Areas of Nuclear Power Plants," as it relates to guidance on acceptable methods to control access to high and very high radiation areas in nuclear power plants that follows the requirements specified in 10 CFR Part 20.

24. NUREG-0041, "Manual of Respiratory Protection Against Airborne Radioactive Materials," as it relates to provision of technical information to licensees on the appropriate application of respiratory protective devices for protection against airborne radioactive materials, including selection and maintenance of equipment, and training of personnel.

25. NUREG-0731, "Guidelines for Utility Management Structure and Technical Resources," as it relates to appropriate staffing levels and technical expertise considered essential within a utility to support nuclear power plant operation properly.

26. NUREG-1736, "Consolidated Guidance: 10 CFR Part 20 - Standards for Protection Against Radiation," as it relates to the requirements for a radiation protection program (including program review and audit) and compliance with Part 20.

27. ANSI/ANS 3.1-1978 Reaffirmed 1999, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants," as it relates to criteria for selection, qualifications, responsibilities, and training of personnel in operating and support organizations, appropriate for the safe and efficient operation of nuclear power plants.

28. ANSI N13.6-1999, "Practice for Occupational Radiation Exposure Records Systems," as it relates to guidance to the employer for the systematic generation and retention of records relating to occupational radiation exposure.

29. ANSI/HPS N13.11-2001, "Personnel Dosimetry Performance – Criteria for Testing," as it relates to the performance criteria of personal radiation dosimeters that require processing.

30. ANSI/HPS N13.14-1994, "Internal Dosimetry Programs for Tritium Exposure - Minimum Requirements," as it relates to personnel monitoring.

31. ANSI/HPS N13.30-1996, "Performance Criteria for Radiobioassay," as it relates to detection and dosimetry of internally deposited radionuclides.

32. ANSI/HPS N13.42-1997, "Internal Dosimetry for Mixed Fission Activation Products," as it relates to monitoring of radiation dose from internally deposited radionuclides.

33. ANSI IEEE 309-1991, "Test Procedure for Geiger-Mueller Counters," as it relates to guidance on specification of test conditions, such as associated electronic circuitry, environment, counting rate, to assure that operating characteristics can be appropriately evaluated.

34. ANSI N42.20-2003, "Performance Criteria for Active Personnel Radiation Monitors," as it relates to the accuracy and overall performance of personnel radiation monitors.

35. ANSI N42.17A-1989, "Performance Specifications for Health Physics Instrumentation - Portable Instrumentation for Use in Normal Environmental Conditions," as it relates to the accuracy and overall performance of portable survey instruments.

36. ANSI N323A-1997, "American National Standard Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments," as it relates to the calibration and maintenance of portable radiation survey instruments.

Specific criteria necessary to meet the Commission's regulations, regulatory guides, and industry standards identified above are as follows:

A. Organization

Acceptance will be based on a determination that the organization described, along with the duties, qualifications, and training of the individuals responsible for assuring that ORE will be ALARA are in accordance with 10 CFR 20.1101(b) and the definition of ALARA in § 20.1103, Regulatory Guides 1.8, 8.2, 8.8, and 8.10, and 10 CFR 19.12, and within the limits of 10 CFR 20.1201, 20.1202, 20.1203, 20.1204, 20.1301, and 20.1302, 10 CFR 50.120, NUREG-0731, and NUREG-1736. Alternatives will be evaluated on the basis of a comparison with the referenced regulatory guides.

B. Equipment, Instrumentation, and Facilities

Acceptance will be based on a determination that:

1. There are sufficient sampling and analysis capabilities for reactor coolant and containment samples during normal and accident conditions consistent with 10 CFR 50.34(f)(2)(viii).

2. The radio-chemistry laboratory is equipped to perform routine analyses required for personnel protection, surveys, and related radiation protection functions, in accordance with 10 CFR 20.1501.

3. The counting room (low background) has the necessary instrumentation to perform routine counting on all plant radioactivity samples (water, air, swipes, etc.) in conformance with 10 CFR 20.1501, and General Design Criterion 64 in 10 CFR Part 50, Appendix A. Counting room equipment normally includes the following:

   (a) Radionuclide spectrometry equipment (such as a multi-channel gamma pulse height analyzer).

   (b) Low background alpha-beta proportional counter and gamma and alpha-beta scintillation counters.

   (c) End window G-M type counter.

4. Instruments for measuring radiation or radioactivity in accordance with 10 CFR 20.1501, normally include:

   (a) Portable low- and high-range ion chamber rate meters (see Regulatory Guide 1.97 for ranges).

(b) Portable G-M counters.

(c) Portable Alpha scintillation or proportional counter rate meters.

(d) Portable Neutron dose equivalent rate meters.

(e) Fixed and portable air samplers for use with particulate filters and iodine collection devices (such as charcoal cartridges or equivalent filters) and airborne radioactivity monitors.

(f) High-range instruments, in accordance with Regulatory Guide 1.97.

(g) Fixed area monitors with local and remote readouts and alarming functions.

(h) Small item contamination (i.e., “Box”) counters.

5. Personnel monitoring instruments in accordance with 10 CFR 20.1501 and 20.1502 to include:

(a) Personnel contamination monitors (friskers, hand and foot, stand-up portal monitors, etc.).

(b) Self-reading low and intermediate pocket dosimeters, including audible alarm dosimeters (for early evaluation of individual doses). Performance and other requirements shall conform to Regulatory Guides 8.4 and 8.28 or to appropriate proposed alternatives.

(c) Remote and local reading alarming dosimeters (coupled with direct or electronic surveillance equipment) for monitoring workers in high dose/high dose rate environments.

(d) Personal dosimeters (such as film badges, thermoluminescent dosimeters (TLD), ocularly stimulated dosimeters (OSD), etc.) of sufficient range and sensitivity, that are processed and evaluated by a NVLAP accredited processor, as appropriate, in conformance with 10 CFR 20.1501(c).

(e) Provisions for Bioassay (in-vivo and in-vitro as appropriate) and facilities, capable of detecting intakes of expected radionuclides (such as mixed fission and activation products, tritium, and alpha emitting nuclides) to meet the requirements of 10 CFR 20.1204 and Regulatory Guides 8.9, 8.20, 8.26, and 8.32, or to appropriate proposed alternatives.

6. Utility-issued personnel protection equipment to be included:

(a) Anti-contamination clothing.

(b) Plastic suits for contamination control in wet work environments.

(c) Head covers, shoe covers, gloves, face shields, and safety-related items (including provisions for personnel cooling in high-temperature work environments).

(d) Pressure demand (e.g., full-face piece) air line respirators.

(e) Pressure demand self-contained breathing apparatus.

(f) Air purifying respirators (e.g., full-face negative pressure, powered air purifying, etc.).

(g) Respiratory protection equipment and facilities should meet the requirements of 10 CFR 20.1703

(h) Work efficiency equipment (e.g., ice vests, air supplied suits, or other heat stress coping equipment).

7. As a minimum the following radiation protection support facilities or areas to be provided:

(a) Portable instrument calibration and storage area. The latter should be easily accessible.

(b) Personnel decontamination area with necessary monitoring equipment. This facility should be located and designed to expedite rapid cleanup of male and female personnel and should not be used as a multiple purpose area.

(c) Facility and equipment to clean, sanitize, repair, and decontaminate personnel protective equipment, monitoring instruments, respirators, etc.

(d) A change room for donning protective clothing (i.e., Anti-Cs) and storage of personal items.

(e) Control points for entrance or exit into controlled access areas of the plant, condition signs, labels, and signals, in accordance with 10 CFR 20.1601, 20.1602, 20.1901, 20.1902, 20.1903, 20.1904, and 20.1905.

(f) Storage and control capability for licensed materials in unrestricted areas, in accordance with the 10 CFR 20.1801 and 20.1906.

(g) One or more radiation protection stations, which may be used as locations for storage and issuance of portable radiation survey equipment, respiratory protective equipment, personnel monitoring equipment, and contamination control supplies. The equipment should be readily accessible and the stations should be equipped to facilitate communication throughout the plant.

(h) Training facilities for conducting general employee training, HP technician hands-on practical factors exercises, and pre-work ALARA mockup training.

(i) Radiation work control stations (and, or remote surveillance facilities) for overseeing work in high radiation and very high-radiation areas.

8. Special shields and equipment:

(a) Lead blankets.

(b) Remote tools and handling equipment.

(c) Portable ventilation equipment.

Acceptance will also be based on implementation of the guidance of Regulatory Guide 8.8 or the provision of acceptable alternatives.

C. Procedures

Plans and procedures will be acceptable if they meet the criteria provided in 10 CFR 20.1101, 20.1601, and 20.1602 or STS for access control, Regulatory Guides 1.33, 1.8, 8.8, 8.10, 8.15, and 8.38, or proposed appropriate alternatives. There should be provision for a special control procedure to ensure that measures are implemented such that personnel are not able to gain unauthorized or inadvertent access to a very high-radiation area. The radiation work permit program should include the following: data on radiation levels in the area, allowable working time, protective clothing and respiratory protective equipment, special tools, portable shielding, and special personnel monitoring devices. Description of operation, maintenance, repair, surveillance, and refueling procedures and methods used by the applicant should be reviewed to assure that occupational radiation exposures will be ALARA and in accordance with Regulatory Guide 8.8. For major dose accumulating functions, a postoperation review should be conducted to evaluate the effectiveness of the work permit program in assuring that occupational radiation exposures (ORE) will be ALARA in future similar activities. Quality assurance criteria and inspections should be provided for the radiation procedures identified in Regulatory Guide 1.33, in accordance with 10 CFR Part 50, Appendix B. Quality assurance of procedures applicable to packaging and transportation of radioactive materials are in accordance with 10 CFR Part 71, Subpart H. There should be provisions for supervision and control of the handling or movement of material within and from radiation or controlled access areas, and procedures for controlling the speed of radioactive materials. There shall also be provisions for personnel monitoring procedures, bioassay, keeping records of and reporting of personnel doses. 10 CFR 20.1501, 20.1502, 20.2101, 20.2102, 20.2103. 20.2104, 20.2105, 20.2106, 20.2107, 20.2110, 20.2201, 20.2203, 20.2204, 20.2205, and 02.2306 provide the criteria for radiation surveys, personnel monitoring, bioassay, record keeping, and reporting. Guidance regarding these areas is provided by Regulatory Guides 8.2 and 8.25 (surveys and personnel monitoring), 8.9, 8.20, 8.26, and 8.32 (bioassay), and 8.2, 8.7 (record keeping and reporting), 8.8 (decontamination, inspection, radiation protection program, and operations), 8.13 (training on radiation risks to fetuses), 8.27 (radiation protection training), 8.29 (training on radiation risks), 8.34 (monitoring criteria and calculating occupational doses), 8.35 (planned special exposures), 8.36 (doses to the embryo/fetus), and by NUREG-0736.

The acceptability of the radiation protection program will also be based on provisions for the indoctrination and personnel training and retraining programs. Regulatory Guides 1.8, 8.8,

8.10, 8.15, and 8.27. 10 CFR 19.12 requires instruction of personnel on radiation protection. There should be an annual review of the radiation protection program, which should include updating procedures, equipment, and facilities where improvements are possible. Different parts of the radiation protection program can be reviewed each year, on a rotating basis, such that the entire program is reviewed at least once every 3 years. The program should include regular audits to determine where occupational radiation exposures are occurring and to review possible methods for reducing these exposures.

Using the methods listed in 10 CFR 50.34(f)(2)(xxvii) and additional guidance from Section III.D.3.3 of NUREG-0718, applicants for construction permits (CPs) should provide preliminary design information concerning monitoring in-plant radiation dose rates and airborne radioactivity for a broad range of routine and emergency conditions. The monitors should meet the criteria of Regulatory Guide 1.97.

Using the methods listed in 10 CFR 50.34(f)(2)(xxvii) and additional guidance from Section III.D.3.3 of NUREG-0737, applicants for operating licenses (OLs) and combined operating licenses shall describe the equipment, training, and procedures to measure accurately the radioiodine concentration and external radiation dose rate levels in areas within the plant where plant personnel may be present during an accident.

Using the methods listed in 10 CFR 50.34(f)(2)(viii) and additional guidance from Section II.B.3 of NUREG-0737, applicants for OLs and combined operating licenses shall describe the equipment, training, and procedures to obtain and analyze samples of reactor coolant and containment during an accident without resulting in excessive radiation doses to plant personnel.

Utility management structure and technical lessons will be acceptable if they meet the criteria provided in Regulatory Guide 8.8 and NUREG-0731.

D. Program Implementation

Acceptance will be based on a determination that the Part 52 combined license applicant has described the intended implementation of the radiation protection program. A phased-in implementation should include appropriate milestones in the construction of the facility. Staffing levels, equipment, facilities, and procedures necessary to ensure radiation safety of the workers and public for each phase of implementation shall be identified. At a minimum, the program implementation at the following milestones must be addressed:

1. Prior to receipt of licensed radioactive sources.

2. Prior to receipt of special nuclear material (i.e., reactor fuel) subject to the monitoring requirements of 10 CFR 70.24.

3. Prior to loading fuel in reactor vessel.

4. Prior to first shipment of radioactive material from the facility site.

E. Technical Rationale

The technical rationale for application of the above acceptance criteria is discussed in the following paragraphs.

1. Compliance with 10 CFR 19.12 requires that occupational workers be kept informed of radiation levels, be instructed in health problems associated with exposure to radiation, be instructed in precautions to minimize exposure to radiation, be instructed to report violations of Commission regulations, and be instructed in response to warnings of an unusual occurrence.

   The SRP Section 12.5 relates to review and approval of the radiation protection program that is required to be implemented at all nuclear power plants. It covers the administration of the program, problem identification and resolution, the qualifications of radiation protection personnel, the equipment and facilities that support the radiation protection program, and the operating and administrative procedures that must be in place. The requirements imposed by 10 CFR 19.12, instructions provided to individuals who receive occupational exposures, are one aspect of the overall radiation protection program at a nuclear plant site.

   Meeting the requirements of 10 CFR 19.12 provides a level of assurance that radiation doses to individuals who work in restricted areas will be limited to the lowest practicable level because § 19.12 requires that the workers themselves be stakeholders in maintaining low levels of radiation doses.

2. The referenced sections of 10 CFR Part 20 relate to the administration of the radiation protection program to be used in the operation of a nuclear power plant.

   The referenced sections of 10 CFR Part 20 specify in detail the administrative procedures including problem identification and resolution, maintaining radiation doses ALARA, use of engineering controls, and monitoring to control radiation exposures, doses in unrestricted areas, performance of surveys, posting radiation areas, receiving, control, storage, transfer, and disposal of radioactive material, and maintaining records of and reporting radiation exposures, and therefore apply to this SRP.

   Meeting the requirements of the referenced sections of 10 CFR Part 20 will provide a level of assurance that exposure to radioactivity will be controlled such that individual workers, and members of the public, will only receive radiation doses that are within the limits specified in 10 CFR Part 20 and are ALARA.

3. The NRC regulation 10 CFR 50.34(f)(2)(viii) and 50.34(f)(2)(xxvii) relate to the capability to promptly obtain and analyze reactor coolant and containment atmospheres during accident conditions (without resulting in excessive radiation doses to individuals), and the monitoring of in-plant radiation and airborne radioactivity for routine and accident conditions.

   The SRP Section 12.5 relates to review and approval of the radiation protection program that is required to be implemented at all nuclear power plants. It covers the administration of the program, the qualifications of radiation protection personnel, the equipment and

facilities that support the radiation protection program, and the operating and administrative procedures that must be in place. The requirements imposed by 10 CFR 50.34(f)(2)(viii) and 50.34(f)(2)(xxvii) are an integral part of the areas covered by SRP Section 12.5.

Meeting the requirements of 10 CFR 50.34(f)(2)(viii) and 50.34(f)(2)(xxvii) will provide a level of assurance that actions needed to monitor conditions in the plant during a postulated accident can be performed such that individual workers will not receive radiation doses that exceed the limits specified in 10 CFR Part 20.

4. Compliance with 10 CFR Part 50, Appendix A, GDC 64 requires that means be provided to monitor the atmosphere in areas in which components are located that potentially contain radioactive fluids and gases that may be released during normal operation, anticipated operational occurrences, and during accidents.

   The subject of SRP Section 12.5 is the administrative controls that encompass the radiation protection program. The GDC 64 is applicable to SRP Section 12.5 because one part of the program is monitoring and surveillance of radiation areas during normal operation, anticipated operational occurrences, and following accidental releases of radioactive materials.

   Meeting the requirements of GDC 64 will provide a level of assurance that releases of radioactive materials to the environment will be detected and resultant exposures will be ALARA and not exceed the limits specified in 10 CFR Part 20.

5. The referenced sections in 10 CFR Part 71 relate to the requirements for the packaging and transportation of licensed radioactive materials. These requirements are applicable to the transportation of radioactive wastes as well as the transportation of activated, or contaminated, components, or equipment, transferred during the operation and maintenance of the plant. Additional requirements in 10 CFR Part 20, Appendix G, apply to the transfer of radioactive wastes for land disposal.

   The scope of 10 CFR Part 20, and SRP Section 12.5 include the transfer of radioactive materials. Although the programmatic requirements in 10 CFR Part 71 go beyond monitoring and radiation surveys, they are provided to assure that the transportation of licensed radioactive materials, off site, does not result in unnecessary or inadvertent exposures to members of the public, and that an uncontrolled release of such material does not occur.

   Meeting the requirements of 10 CFR 71.5, in addition to the requirements in 10 CFR Part 20, Appendix G, will provide a level of assurance that releases of radioactive materials to the environment will not result from transportation, or waste disposal, activities and that doses to members of the public will not exceed the limits specified in 10 CFR Part 20.

6. Appendix B to 10 CFR Part 50 establishes the quality assurance requirements, consistent with the guidance in Regulatory Guide 1.33, for the operation of a nuclear power plant.

   The procedures implemented to ensure the quality of the radiation protection program related safety-related activities identified in Regulatory Guide 1.33, and the required

periodic review of the content and implementation of the radiation protection program, are an integral part of the areas covered by SRP Section 12.5.

A quality assurance program that meets the requirements of 10 CFR Part 50, Appendix B, that is established, maintained and executed regarding the radiation protection program, and the transportation of radioactive materials, satisfies the quality assurance requirements in 10 CFR 70.101, and the requirement to annually review the radiation protection program in 10 CFR 20.1101(c).

III. REVIEW PROCEDURES

The reviewer evaluates the acceptability of areas discussed in Subsection I by making the comparisons with criteria in the referenced regulations, regulatory guides, and industry standards. These can be summarized as follows:

1. The organizational position, functional responsibilities, experience, and qualifications of persons responsible for the radiation protection program. The plant organization, the functional responsibilities, and the qualifications of personnel are the primary responsibility of the quality and maintenance section, and operator licensing and human performance section, and are reviewed as part of Chapter 13. The reviewer evaluates the radiation protection organization, function, and personnel qualifications, in accordance with Regulatory Guides 1.8 and 8.8.

2. The equipment necessary to measure radioactivity, and radiation fields and exposures, including the number, type, range, sensitivity, calibration method and frequency, availability, and planned used of portable, fixed, laboratory, and personnel monitoring instrumentation, for all units on the site.

3. The health physics facilities and associated protective equipment for controlling ORE and contamination.

4. Description of methods for assuring development of the training, retraining, and indoctrination program and radiation protection instruction manuals.

5. The procedures to receive, store, transfer, and dispose of radioactive material, to control exposures, to control contamination, to provide adequate radiation monitoring, and to conduct program reviews and quality assurance. Review of the quality assurance program is the primary responsibility of the quality and maintenance section, and operator licensing and human performance section, and are reviewed as part of SRP Chapter 17.

Based on the review, the reviewer may request additional information or request the applicant to modify the submittal, in order to meet the acceptance criteria described in Section II.

IV. EVALUATION FINDINGS

The staff's review should verify that sufficient information is contained in the SAR and amendments to arrive at conclusions of the following type, which are to be included in the staff's

safety evaluation report. The report will include a summary of the applicant's submittal, the staff's basis for review and acceptance criteria, and the findings of the review.

The staff concludes that the operational radiation protection program is acceptable and meets the requirements of 10 CFR 19.12 and 19.13; 10 CFR Part 20; and 10 CFR Part 50, Appendix A, General Design Criterion 64. This conclusion is based on the following findings:

The radiation protection program objectives are to provide reasonable assurance that the limits of 10 CFR 20.1201, 20.1202, 20.1203, 20.1204, 20.1207, and 20.1208, will not be exceeded, to reduce unavoidable exposures further, and to ensure that individual occupational radiation exposures are maintained as far below regulatory limits as is reasonably achievable, and that total person-rem doses are as low as is reasonably achievable, in accordance with 10 CFR 20.1101(b) and the definition of ALARA in § 20.1003 and Regulatory Guides 8.8 and 8.10.

The duties of the plant (radiation protection manager) include (list duties). The radiation protection organizations, qualifications, training of personnel, objectives of the program, and ways in which it will be implemented are in accordance with the guidelines of Regulatory Guides 1.8, 8.2, 8.8, 8.10, and 8.13, and with 10 CFR 19.12, and NUREG-0731 are acceptable.

The radiation protection features at (plant name) include a (radiochemistry lab, personnel decontamination and emergency treatment areas, an access control point, counting room, calibration room, respirator testing facility, office, laundry, etc.). These facilities are sufficient to maintain occupational radiation exposures as low as is reasonably achievable and are consistent with the guidelines of 10 CFR 50.34(f)(2)(xxvii) and NUREG-0737 Section III.D.3.3 which provides additional detail and clarification of requirements, and with the provisions of Regulatory Guide 8.8.

Equipment to be used for radiation protection purposes includes portable radiation survey instruments, personnel monitoring equipment, fixed and portable area and airborne radioactivity monitors, laboratory equipment, air samplers, respiratory protective equipment, and protective clothing. The number and types of equipment to be used are adequate, meet the criteria of Regulatory Guide 1.97, and provide reasonable assurance that the applicant will be able to maintain occupational exposures as low as is reasonably achievable.

All permanent and temporary plant personnel will be assigned (i.e., beta-gamma thermoluminescent dosimeter badges or film badges) to be worn in restricted areas at all times. These badges will be processed by a processor accredited under NVLAP, as appropriate. All personnel assigned (TLD or film badges) are also required to wear (direct or indirect) reading dosimeters when entering radiologically controlled areas. The readings from these dosimeters will be used to keep a running total of an individual's dose prior to TLD or film badge processing. Plant visitors wear self-reading dosimeters or are escorted by an individual wearing such personnel dosimetry devices. Appropriate caution signs, labels, and signals will be provided, in accordance with 10 CFR 20.1601, 20.1602, 20.1901, 20.1902, 20.1903, 20.1904, and 20.1905. Neutron film badges, neutron dosimeters, and alarming dosimeters will also be provided for personnel when necessary.

Whole body counts of all plant personnel will be conducted on a scheduled basis and other bioassays will be provided when deemed necessary by the (radiation protection manager), in accordance with 10 CFR 20.1201, 20.1202, 20.1203, and 20.1204. Records of surveys, personnel monitoring, and bioassay will be maintained in accordance with 10 CFR 20.1501, 20.1502, 20.1601, 20.1602, 20.2101, 20.2102, 20.2103, 20.2104, 20.1205, 20.2106, 20.2107, 20.2201, 20.2203, and 20.2306 as well as Regulatory Guide 8.7. All radiation exposure information will be processed and recorded in accordance with 10 CFR Part 20.

The description of maintenance, repair, surveillance, and refueling procedures and methods used by the applicant are reviewed to assure that all plant radiation protection procedures, practices, and criteria have been considered, to assure that occupational radiation exposures will be ALARA and in accordance with Regulatory Guide 8.8. Procedures are also developed to assure that exposure limits are not exceeded by plant or visitor personnel onsite; to administer and control conditions of radiation work permits; to post radiation areas; to establish radiation access control zones; to control all radioactive material entering or leaving the plant site; and to train plant and visitor personnel in radiation protection policies and procedures and meet the quality assurance requirements of Regulatory Guide 1.33, with respect to the requirements of 10 CFR 20.1101, 10 CFR Part 50, Appendix B, and 10 CFR 71.101.

Storage and control of licensed materials in unrestricted areas will be maintained in accordance with 10 CFR 20.1601, 20.1602, 20.1801, 20.1802, 20.1901, and 20.1902.

Facilities and procedures are adequate to provide reasonable assurance that the plant will be operated in a manner that will minimize, to the extent practicable, contamination of the facility and the environment in accordance with §20.1405.

The utility management structure and technical resources meet the criteria provided in NUREG-0731 and are acceptable.

Based on the information presented in the (PSAR, FSAR, design certification application, or combined license application) by the applicant, we conclude that the applicant intends to implement a radiation protection program that will maintain in-plant radiation exposures as far below the applicable limits of 10 CFR Part 20 as is reasonably achievable, and will maintain radiation exposures as low as is reasonably achievable.

V. IMPLEMENTATION

The following is intended to provide guidance to applicants and licensees regarding the NRC staff's plans for using this SRP section.

This SRP section will be used by the staff when performing safety evaluations of license applications submitted by applicants pursuant to 10 CFR Parts 50 or 52.

Except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein will be used by the staff in its evaluation of conformance with Commission regulations.

The provisions of this SRP section apply to reviews of applications docketed 6 months or more after the date of issuance of this SRP section.

Implementation schedules for conformance to parts of the method discussed herein are contained in the referenced regulatory guides and NUREGs.

VI. REFERENCES

1. 10 CFR Part 19, "Notices Instructions, and Reports to Workers: Inspections and Investigations."
2. 10 CFR Part 20, "Standards for Protection Against Radiation."
3. 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."
4. 10 CFR Part 71, "Packaging and Transportation of Radioactive Material."
5. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants."
6. Regulatory Guide 1.33, "Quality Assurance Program Requirements (Operations)."
7. Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident."
8. Regulatory Guide 8.2, "Guide for Administrative Practices in Radiation Monitoring."
9. Regulatory Guide 8.4, "Direct-Reading and Indirect-Reading Pocket Dosimeters."
10. Regulatory Guide 8.6, "Standard Test Procedures for G-M Counters."
11. Regulatory Guide 8.7, "Instructions for Recording and Reporting Occupational Radiation Exposure Data."
12. Regulatory Guide 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be as Low as is Reasonably Achievable."
13. Regulatory Guide 8.9, "Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program."
14. Regulatory Guide 8.10, "Operational Philosophy for Maintaining Occupational Radiation Exposures as Low as is Reasonably Achievable."
15. Regulatory Guide 8.13, "Instruction Concerning Prenatal Radiation Exposure."
16. Regulatory Guide 8.15, "Acceptable Programs for Respiratory Protection."
17. Regulatory Guide 8.20, "Applications of Bioassay for I-125 and I-131."

18. Regulatory Guide 8.25, “Air Sampling in the Workplace.”

19. Regulatory Guide 8.26, “Applications of Bioassay for Fission and Activation Products.”

20. Regulatory Guide 8.27, “Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants.”

21. Regulatory Guide 8.28, “Audible Alarm Dosimeters.”

22. Regulatory Guide 8.29, “Instruction Concerning Risks from Occupational Radiation Exposure.”

23. Regulatory Guide 8.32, “Criteria for Establishing a Tritium Bioassay Program.”

24. Regulatory Guide 8.34, “Monitoring Criteria and Methods to Calculate Occupational Radiation Doses.”

25. Regulatory Guide 8.35, “Planned Special Exposures.”

26. Regulatory Guide 8.36, “Radiation Doses to Embryo/Fetus.”

27. Regulatory Guide 8.38, “Control of Access to High and Very High Radiation Areas of Nuclear Power Plants.”

28. NUREG-0041, “Manual of Respiratory Protection Against Airborne Radioactive Materials.”

29. NUREG-0731, “Guidelines for Utility Management and Technical Resources.”

30. NUREG-0737, “Clarification of TMI-Action Plan Requirements.”

31. NUREG-1736, “Consolidated Guidance: 10 CFR Part 20 - Standards For Protection Against Radiation.”

32. ANSI/ANS 3.1-1993 R99, “Selection, Qualification, and Training of Personnel for Nuclear Power Plants.”

33. ANSI/HPS N13.6, “Practice for Occupational Radiation Exposure Records Systems.”

34. ANSI/HPS N13.11-2001, “Personnel Dosimetry Performance – Criteria for Testing.”

35. ANSI/HPS N13.14-1994, “Internal Dosimetry Programs for Tritium Exposure - Minimum Requirements.”

36. ANSI/HPS N13.30-1996, “Performance Criteria for Radiobioassay.”

37. ANSI/HPS N13.42-1997, “Internal Dosimetry for Mixed Fission Activation Products.”

38. ANSI IEEE 309-1991, “Test Procedure for Geiger-Mueller Counters.”

39. ANSI N42.20-2003, “Performance Criteria for Active Personnel Radiation Monitors.”

40. ANSI N42.28-2002, “American National Standard for Calibration of Germanium Detectors for In-Situ Gamma-Ray Measurements.”

41. ANSI N42.17A-1989, “Performance Specifications for Health Physics Instrumentation - Portable Instrumentation for Use in Normal Environmental Conditions.”

42. ANSI N323A-1997, “American National Standard Radiation Protection Instrumentation Test and Calibration, Portable Survey Instruments.”

Attachment: Description of Changes

The following summarizes the proposed changes in Draft Revision 3, dated December 2005.

1. General changes:

    a. Editorial changes made to reflect the review responsibilities as functions. The cognizant organization is maintained separately from the SRP. Similarly, references to other SRP sections no longer identify the specific branch.

    b. Added language throughout SRP section to extend applicability to 10 CFR Part 52.

    c. General editorial changes to add clarity to SRP Section

2. Technical changes:

    a. The changes consist mostly of revising the references to 10 CFR 20

        i. The 1991 major revision to Part 20 (56 FR 23391, May 21, 1991, as revised at 60 FR 20185, April 25, 1995), which changed the basis of the radiation dose limits (e.g., Effective Dose), added several new requirements (i.e., dose limits for embryo/fetus, Planned Special Exposures, a lower dose limit for members of the public, etc.) and completely renumbered the paragraphs of the part.

        ii. New requirements were added in 10 CFR 20.1406, "Minimization of Contamination" (63 FR 39088, July 21, 1997).

        iii. 10 CFR 20 Subpart H, "Respiratory Protection" introduced in 1999 (64 FR 54556, October 7, 1999, as revised at 67 FR 77652, December 19, 2002).

    b. Updated reference to 10 CFR 50.34(f)(2)(xxvii) and NUREG-0737 Section III.D.3.3. and added reference to § 50.34(f)(2)(viii) and NUREG-0737 Section II.B.3. for completeness.

    c. Added reference to material control and quality assurance requirements in 10 CFR Part 71, for completeness.

    d. Added Section D. “Program Implementation” to the acceptance criteria which addresses the phased-in program implementation, by a combined license applicant.

    e. Added Section E. “Technical Rationale” to the acceptance criteria which gives the technical basis for each of the acceptance criteria

3. Section VI, REFERENCES has been updated by removing outdated or withdrawn Regulatory Guides, NUREGs, and industry standards; revising references to the current titles of several guides and standards; adding references to new industry standards that supercede withdrawn standards; and adding the Regulatory Guides issued in support of the 1991 revision to 10 CFR 20.

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10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

The revision updates the Revision 1 July 1981 version of NUREG-0800, Chapter 12, section 12.5, Operational Radiation Protection Program, to the Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants. The changes consist mostly of revising the references to 10 CFR 20; assigning different responsibilities to the primary and secondary branches because of office reorganizations; editorial and formatting changes as part of the SRP update effort; and updating the references to several guidance documents and industry standards. The revision also adds standard paragraphs to extend application of the updated SRP section to the design certification reviews as well as to extend implementation of this section to submittals by applicants pursuant to 10 CFR Part 50 or 10 CFR Part 52.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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