March 18, 2009

Mr. Russell J. Bell, Director
New Plant Licensing
Nuclear Generation Division
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: FINAL SAFETY EVALUATION FOR NUCLEAR ENERGY INSTITUTE TOPICAL REPORT NEI 07-03, GENERIC FINAL SAFETY ANALYSIS REPORT TEMPLATE GUIDANCE FOR RADIATION PROTECTION PROGRAM DESCRIPTION, REVISION 7 (PROJECT NO. 689)

Dear Mr. Bell:

By letter dated April 12, 2007, the Nuclear Energy Institute (NEI) submitted for U.S. Nuclear Regulatory Commission (NRC) staff review its proposed topical report, NEI 07-03, "Generic Final Safety Analysis Report (FSAR) Template Guidance for Radiation Protection (RP) Program Description," Revision 0. The template has undergone seven subsequent revisions. NEI submitted Revision 7 of the RP template by letter dated November 14, 2008.

Enclosed is the staff's safety evaluation (SE) which defines the basis for acceptance of NEI 07-03, Revision 7. The NRC staff finds that for combined license (COL) applications, NEI 07-03, Revision 7, provides an acceptable template for assuring that the RP program meets applicable NRC regulations and guidance.

Our acceptance applies only to material provided in NEI 07-03, Revision 7. We do not intend to repeat our review of the acceptable material described in the NEI 07-03, Revision 7. When the NEI 07-03, Revision 7 appears as a reference in COL applications, our review will ensure that the material presented applies to the specific application involved. Licensing requests that deviate from NEI 07-03, Revision 7, will be subject to a plant-specific or site-specific review in accordance with applicable review standards.

In accordance with the guidance provided on the NRC website, we request that NEI publish the accepted version of NEI 07-03, Revision 7 within three months of receipt of this letter. The accepted version should incorporate this letter and the enclosed SE after the title page. The accepted version should also contain historical review information, including NRC's requests for additional information and your responses. The accepted versions shall include a "-A" (designating accepted) following the report identification symbol.

If future changes to the NRC's regulatory requirements affect the acceptability of NEI 07-03, Revision 7, NEI will be expected to revise NEI 07-03 appropriately, or justify its continued applicability for subsequent referencing.

If you have any questions, please contact Sheryl A. Burrows at (301) 415-6086 or via email at Sheryl.Burrows@nrc.gov.

Sincerely,

/RA/

William F. Burton, Chief
Rulemaking and Guidance Development Branch
Division of New Reactor Licensing
Office of New Reactors

Project No. 689

Enclosure:
Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION

REGARDING THE NUCLEAR ENERGY INSTITUTE

TECHNICAL REPORT 07-03

"GENERIC FSAR TEMPLATE GUIDANCE FOR

RADIATION PROTECTION PROGRAM DESCRIPTION"

REVISION 7

1.0 BACKGROUND

By letter dated November 24, 2008, the Nuclear Energy Institute (NEI) submitted a technical report NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description," Revision 7, for U. S. Nuclear Regulatory Commission (NRC) staff review. The technical report provides a complete generic radiation protection (RP) program description for use with combined license (COL) applications. NEI 07-03 was developed by the NEI New Plant Radiation Protection Task Force, which includes representatives from the four design-centered working groups, to assist in expediting NRC review and issuance of the combined license. NEI 07-03 is not applicable to the review and issuance of construction permits or operating licenses.

The generic Radiation Protection Program description presented in the NEI 07-03 Template commits an applicant to NRC regulatory requirements, guidance and acceptance criteria listed in Regulatory Guide (RG) 1.206 [Reference 5.3] and Section 12.5 of the Standard Review Plan (SRP) (NUREG-0800, March 2007) [Reference 5.2]. The NEI template identifies text entries that an applicant will provide as additional information. This information is identified in the NEI 07-03 Template by single braces ("[ ]") and the use of the word "note" preceding the text. Such information includes detailed descriptions of design and administrative controls for restricting access to Very High Radiation Areas, and a reference to the applicable Radiation Protection Program quality assurance criteria described in the applicant's Final Safety Analysis Report (FSAR). The NEI 07-03 Template also identifies text where the applicant may modify the generic information with plant and site-specific features. This information is identified in the template by the use of single braces ("[ ]"). As a result, the NEI 07-03 Template complies with applicable NRC regulations and guidance and may be used for COL applications submitted under the requirements of Subpart C of Title 10 of the *Code of Federal Regulations*, Part 52 (10 CFR Part 52). If a COL is issued, the licensee must develop operational programs by their implementation milestones, as required prior to fuel load, under regulatory requirements specified in Section 13.4 of applications, license conditions, and design certifications (DCs).

2.0 REGULATORY EVALUATION

The NRC staff verified that NEI 07-03, Revision 7, complies with the following regulations, regulatory guidance, NUREGs, and industry standards:

- 10 CFR Part 19, “Notices, Instructions and Reports to Workers: Inspections and Investigations”
- 10 CFR Part 20, “Standards for Protection against Radiation”
- 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities”
- 10 CFR Part 52, “Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants”
- 10 CFR Part 71, Subpart G, “Operating Controls and Procedures”
- 10 CFR Part 71, Subpart H, “Quality Assurance”
- RG 1.8, Revision 3, “Qualification and Training of Personnel for Nuclear Power Plants”
- RG 1.97, “Criteria for Accident Monitoring Instrumentation for Nuclear Power Plants”
- SRP Branch Technical Position (BTP) 7-10, “Guidance on Application of RG 1.97”
- RG 8.2, “Guide for Administrative Practices in Radiation Monitoring”
- RG 8.4, “Direct-Reading and Indirect-Reading Pocket Dosimeters”
- RG 8.6, “Standard Test Procedures for G-M Counters”
- RG 8.7, “Instructions for Recording and Reporting Occupational Radiation Exposure Data”
- RG 8.8, “Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be as Low as Is Reasonably Achievable”
- RG 8.9, “Acceptable Concepts, Models, Equations, and Assumptions for a Bioassay Program”
- RG 8.10, “Operational Philosophy for Maintaining Occupational Radiation Exposures as Low as Is Reasonably Achievable”
- RG 8.13, “Instruction Concerning Prenatal Radiation Exposure”
- RG 8.15, “Acceptable Programs for Respiratory Protection”
- RG 8.27, “Radiation Protection Training for Personnel at Light-Water-Cooled Nuclear Power Plants”

- RG 8.28, “Audible Alarm Dosimeters”
- RG 8.29, “Instruction Concerning Risks from Occupational Radiation Exposure”
- RG 8.34, “Monitoring Criteria and Methods To Calculate Occupational Radiation Doses”
- RG 8.35, “Planned Special Exposures”
- RG 8.36, “Radiation Doses to Embryo/Fetus”
- RG 8.38, “Control of Access to High and Very High Radiation Areas of Nuclear Power Plants”
- NUREG-0737, “Clarification of TMI Action Plan Requirements”
- NUREG-1736, “Consolidated Guidance: 10 CFR Part 20—Standards For Protection Against Radiation”
- NUREG-0800, Revision 3, Standard Review Plan, Section 12.5, “Operational Radiation Protection Program”

3.0 TECHNICAL EVALUATION

The staff’s review concentrated on the proposed radiation protection program description format, attributes and level of detail. In evaluating the adequacy of the format, attributes and level of detail, the staff followed the guidance of the SRP (NUREG-0800), Section 12.5 (SRP 12.5), “Operational Radiation Protection Program.” SRP 12.5 outlines an operational radiation protection program for DC, COL, construction permit, and operating license applicants and provides guidance in five radiation protection program operational program areas: organization, equipment, instrumentation, facilities and procedures.

3.1 Operational Radiation Protection Program Description Template Overview

NEI 07-03 provides guidance for a complete generic program description for use in developing COL applications. It will be incumbent on the applicant to provide site specific information, as described in NEI 07-03, to create a complete description of an operational radiation protection program, the purpose of which will be to maintain occupational and public doses below regulatory limits and as low as is reasonably achievable (ALARA). In order to achieve this, the program will include the following elements:

1) A documented management commitment to keep exposures ALARA;

2) A trained and qualified organization with sufficient authority and well-defined responsibilities; and

3) Adequate facilities, equipment, and procedures to effectively implement the program.

NEI 07-03 describes a radiation protection program that will be implemented in stages consistent with the following milestones:

1) Prior to initial receipt of by-product, source, or special nuclear materials the following radiation protection program elements will be in place:

    a. Organization – A radiation protection program supervisor and at least one (1) radiation protection technician for each operating shift, selected, trained and qualified consistent with the guidance in RG 1.8.

    b. Facilities – A facility or facilities to support the receipt, storage and control of non-exempt radioactive sources in accordance with 10 CFR 20.1801, 20.1802, and 20.1906.

    c. Instrumentation and Equipment – Adequate types and quantities of instrumentation and equipment will be selected, maintained, and used to conduct radiation surveys and monitoring (in accordance with 10 CFR 20.1501 and 20.1502) for the types and levels of radiation anticipated for the non-exempt sources that will be possessed under the license.

    d. Procedures – Procedures will be established, implemented and maintained sufficient to maintain adequate control over the receipt, storage and use of radioactive materials that will be possessed under the license and to assure compliance with 10 CFR 19.11 and 19.12 and 10 CFR Part 20.

    e. Training – Initial and periodic training will be provided to individuals responsible for the receipt, control or use of non-exempt radioactive sources possessed under the license in accordance with 10 CFR 19.12 and consistent with the guidance in RGs 1.8, 8.13, 8.27, and 8.29.

2) Prior to receiving reactor fuel under this license, and thereafter whenever reactor fuel is possessed under the license, radiation monitoring will be established, implemented and maintained and procedures on criticality accident requirements will be established, implemented and maintained in accordance with 10 CFR 50.68, in addition to the radiation protection program elements specified in item 1 above.

3) Prior to initial loading of fuel in the reactor, all functional program areas described in this template will be fully implemented, with the exception of the program elements described in item 4 below. In addition, the position of radiation protection manager, as described in section 12.5.2.3, will be filled and at least one (1) radiation protection technician for each operating shift, who has been selected, trained and qualified consistent with the guidance in RG 1.8, will be onsite and on duty when fuel is initially loaded in the reactor, and thereafter, whenever fuel is in the reactor.

4) Prior to initial transfer, transport or disposal of radioactive materials, the organization, facilities, equipment, instrumentation, and procedures will be in place as necessary to assure compliance with 10 CFR Part 20, Subpart K, and applicable requirements in 10 CFR Part 71.

NEI 07-03 is organized into four areas: management policy; organization; facilities, instrumentation and equipment; and procedures.

3.2 Management Policy

The “Management Policy” section of NEI 07-03 states that plant management will issue written policy on radiation protection, consistent with RGs 8.8 and 8.10, which will include commitments to the following:

1) The design, construction and operation of the plant will be such that occupational and public radiation exposures and releases of licensed radioactive materials will be maintained ALARA.

2) Regulatory radiation requirements, dose limits, and limits on releases of radioactive materials will be complied with.

3) A radiation protection program will be implemented and maintained such that radiation doses will be kept below regulatory limits, as well as ALARA.

4) Each manager and supervisor in the plant organization will understand and be held accountable for implementing his or her responsibility to integrate radiation protection controls into work activities.

5) Each individual working at the facility will understand and accept the responsibility of following radiation protection procedures and instructions provided by radiation protection staff and of maintaining his or her dose ALARA.

6) The Radiation Protection Manager will be provided with the delegable authority to stop work or order an area evacuated when the radiation conditions warrant such an action and such actions are consistent with plant safety.

7) A direct reporting chain will be established from the Radiation Protection Manager to the Plant Manager that is independent of the reporting chains for Operations and Maintenance. This aspect of the radiation protection program is also addressed in the Technical Specifications (TSs) (i.e., Section 5.2, Organization) cited in Section 16.0 of DC and COL applications [References 5.4 and 5.5].

8) An ALARA committee will be established with delegated authority from the Plant Manager which will include, at a minimum, the managers of Operations, Maintenance, Work Control, Engineering and Radiation Protection to help assure effective implementation of line organization responsibilities for maintaining worker doses ALARA.

Based on the staff’s review of the “Management Policy” section of NEI 07-03 outlined above, the staff concludes that NEI 07-03 clearly and sufficiently describes, in terms of scope and level of detail, plant management written policy on radiation protection. This enables the staff to make a reasonable assurance finding of acceptability for issuance of a COL with verification, during the construction stage, of an operational radiation protection program which complies with the applicable regulations and guidance.

3.3 Organization

The “Organization" section of NEI 07-03 states that the qualification and training criteria for site personnel are described in FSAR Chapter 13 and are consistent with RG 1.8. Specific radiation program responsibilities are described for the following key positions within the plant organization:

- Plant Manager
- Plant Organizational Managers and Supervisors
- Radiation Protection Manager
- Radiation Protection Technicians
- Radiation Protection Supervisory and Technical Staff

3.3.1 Plant Manager

NEI 07-03 states that the Plant Manager will have overall responsibility for the plant, including responsibility for occupational and public radiation safety. His or her radiation protection responsibilities will be consistent with the guidance provided in RGs 8.8 and 8.10. In addition, the Plant Manager will be responsible for ensuring implementation of management radiation protection policy throughout the plant organization, ensuring the overall commitment to radiation protection by the plant organization, ensuring the establishment of an ALARA committee, supporting the Radiation Protection Manager with implementation of the Radiation Protection Program, assuring that exposures to site personnel are maintained ALARA, and other responsibilities as described in Section 12.5.2.1 of NEI 07-03.

3.3.2 Plant Organizational Managers and Supervisors

NEI 07-03 describes radiation protection responsibilities for managers and supervisors. These include establishing goals and expectations for his or her organization and reinforcing behaviors that promote radiation program. In addition, several specific responsibilities are listed for plant organization managers and supervisors including, for example, ensuring radiation protection measures are considered and integrated into plant procedures and design documents and into the planning, scheduling, conduct, and assessment of operations and work; ensuring that site personnel receive periodic training on radiation protection; notifying radiation protection personnel promptly when radiation protection problems occur or are identified; taking corrective actions; and resolving deficiencies associated with operations, procedures, systems, equipment, and work practices.

3.3.3 Radiation Protection Manager

The Radiation Protection Manager (RPM) will have direct responsibility for assuring adequate protection of the public health and safety, as well as the health and safety of personnel working at the plant during all aspects of activities covered within the scope and extent of the license. The RPM’s qualifications and experience will be consistent with the guidance in RG 1.8. The RPM will be responsible for tracking and analyzing trends in radiation work performance and taking necessary actions to correct adverse trends, for supporting the plant emergency preparedness program, for participating as a

member of the ALARA committee, and for other responsibilities as described in Section 12.5.2.3 of NEI 07-03 and consistent with the guidance provided in RGs 8.8 and 8.10.

3.3.4 Radiation Protection Technicians

NEI 07-03 states that the Radiation Protection Technicians (RPTs) will carry out responsibilities defined in the radiation protection program and procedures. Each operating shift will have at least one (1) RPT supplied onsite for each operating shift at all times starting with the initial loading of fuel in any reactor at the site (i.e., at least one RPT is required per site), in accordance with the TS (i.e., Section 5.0, Administrative Controls) cited in Section 16.0 of DCs and COL applications [References 5.3 and 5.4]. The qualifications and experience of RPTs will be consistent with the guidance in RG 1.8. RTPs will be trained and qualified under a program that will be established, implemented and maintained in accordance with 10 CFR 50.120. NEI 07-03 lists several specific radiation protection responsibilities that RPTs will be trained and qualified to implement. These include, for example, the authority (as delegated by the RPM) to stop work or order an area evacuated when the radiation conditions warrant such an action; providing job coverage and monitoring radiation conditions during jobs involving significant radiation exposure; assessing radiation conditions and establishing radiation protection requirements and appropriate controls for access to and work within all types of radiation areas; reviewing planned work and design modifications; providing personnel monitoring and bioassay services; operating, maintaining and calibrating radiation monitoring instrumentation and other responsibilities as delineated in Section 12.5.2.4 of NEI 07-03.

Some of these responsibilities may be modified by the COL applicant based on company or site specific information.

3.3.5 Radiation Protection Supervisory and Technical Staff

Radiation protection supervisory and technical staff will be included within the radiation protection organization as needed to support the RPM in carrying out his or her assigned duties and responsibilities and to oversee and support the work of the RPTs. A specific supervisor or technical staff member, knowledgeable in the respective functional area and trained and qualified consistent with the guidance in RG 1.8, will be assigned overall responsibility for each functional area. NEI 07-03 lists ten such functional areas, including, for example, Respiratory Protection and Personnel Dosimetry.

Responsibility for some of the functional areas may be assigned outside of the radiation protection department; however, the criteria for experience, training and qualification of staff responsible for the program will remain as described above.

Based on the staff's review of the "Organization" section of NEI 07-03 outlined above, the staff concludes that NEI 07-03 clearly and sufficiently describes, in terms of scope and level of detail, the radiation protection responsibilities, qualification and training criteria of site personnel associated with the operational radiation protection program to enable the staff to make a reasonable assurance finding of acceptability for issuance of a COL with verification, during the construction phase, of an operational radiation protection program which complies with the applicable regulations and guidance.

3.4 Facilities, Instrumentation and Equipment

This section of NEI 07-03 describes the facilities, instrumentation and equipment that will be used to support implementation of the radiation protection program during routine operations, refueling and other outages, abnormal occurrences, and accident conditions. The facilities, instrumentation and equipment described in NEI 07-03 will be consistent with the guidance in RGs 1.97, 8.2, 8.4, 8.6, 8.8, 8.9, 8.10, 8.15, 8.28, BTP 7-10 and the criteria in NUREG-0737, Items II.B.3 and III.D.3.3.

3.4.1 Facilities

NEI 07-03 provides a description of the following radiation protection facilities:

- Radiochemistry Laboratory
- Access Control Facility
- Personnel Decontamination Area
- Radiation Protection Offices
- Portable Instrument Calibration Facility
- Respiratory Facility
- Equipment Decontamination Facility
- Machine Shop for Activated/Contaminated Components and Equipment
- Storage and Issue Area for Contaminated Tools and Equipment
- Radioactive Materials Storage Area
- Facility for Dosimetry Processing and Bioassy
- Laundry Facility

Facility descriptions that were previously reviewed in an applicable design control document (DCD) may be incorporated by reference by the COL applicant. The COL applicant may also modify this section to indicate facilities that may be located off site and functions that may be carried out at another location or through a vendor.

3.4.2 Monitoring Instrumentation and Equipment

NEI 07-03 states that the applicant will select, maintain and use sufficient numbers and types of radiation monitoring instrumentation such that the appropriate detection capabilities, ranges, sensitivities and accuracies required for the types and levels of radiation anticipated at the plant and in the environs during routine operations, major outages, abnormal occurrences, and postulated accident conditions, are provided. NEI 07-03 describes the types and nominal characteristics of radiation protection program instrumentation that will be utilized, including laboratory and fixed instrumentation, portable monitoring instrumentation and equipment, and personnel monitoring instrumentation and equipment. Template NEI 07-03 calls out specific instrumentation needed for an operational radiation protection program, including, for example, laboratory analysis equipment to measure gamma, beta and alpha activity; whole-body counters; hand and foot monitors; small article monitors; beta-gamma survey meters with ranges adequate for normal operations, abnormal occurrences and accidents; count rate meters for alpha activity measurements; neutron survey instruments; portable air sampling and analysis systems to determine airborne radioiodine, radio halogen and particulate concentrations during and following an

accident; high and low volume air samplers for assessing airborne radioactivity concentrations; and portable continuous air monitors (CAMs). Characteristics of individual personnel dosimeters are also described and include dosimeters to measure gamma, beta and neutron radiation dose, dosimeters that provide real-time dose information, monitor extremity dose, monitor individual exposure to airborne radioactivity and/or alarm remotely and locally as needed by the situation. The information provided is consistent with the guidance provided in RG 1.97, Revision 4, and SRP BTP 7-10, as well as the criteria in NUREG-0737, Item III.D.3.3.

Additional or alternate instrumentation and equipment may be provided by the COL applicant based on company and site specific information.

3.4.3 Personnel Protective Clothing and Equipment

NEI 07-03 lists the types of personnel protective clothing and equipment that will be used, such as respirators, anti-contamination clothing, head covers, shoe covers, and other protective clothing and equipment. A sufficient inventory of serviceable personnel protective clothing and equipment will be maintained for use during plant operations, refueling and other outages, abnormal conditions, and accidents. Respirators used will be tested and certified for use by the National Institute for Occupational Safety and Health/Mine Safety and Health Administration (NIOSH), or otherwise approved by the NRC. Other protective equipment, such as temporary shielding, and portable ventilation systems with high-efficiency particulate air (HEPA) filters, are also listed as equipment that will be used as required.

Based on the staff's review of the "Facilities, Instrumentation and Equipment" section of NEI 07-03 outlined above, the staff concludes that NEI 07-03 clearly and sufficiently describes, in terms of scope and level of detail, the facilities, instrumentation and equipment associated with the operational radiation protection program to enable the staff to make a reasonable assurance finding of acceptability for issuance of a COL with verification, during the construction stage, of an operational radiation protection program which complies with the applicable regulations and guidance.

3.5 Procedures

The "Procedures" section of NEI 07-03 commits to preparing procedures for radiation protection that will be consistent with the guidance provided in RGs 1.8, 8.2, 8.7, 8.8, 8.10, and the guidance referenced in NUREG-1736 that is applicable to power reactors. This approach complies with the requirements specified in Section 5.4, "Procedures, of the Technical Specifications" cited by the DC and the COL applicants [References 5.4 and 5.5]. The radiation protection procedures will be established, implemented and reviewed against the quality assurance criteria described by the COL applicant in their FSAR. Prior to initial receipt of any by-product, source, or special nuclear material, and thereafter whenever there is reactor fuel onsite, procedures will be established, implemented and maintained sufficient to provide adequate control over the receipt, possession, use, transfer, and disposal of byproduct, source, and special nuclear materials and assure compliance with the applicable portions of 10 CFR Parts 19, 20, 30, 40, 50, 70, and 71. The procedures as described will be implemented by staff trained and qualified in accordance with the requirements of 10 CFR 50.120 and consistent with the guidance in RGs 1.8, 8.13, 8.27, and 8.29.

3.5.1 Radiological Surveillance Procedures

NEI 07-03 states that radiological surveillance procedures will comply with 10 CFR 20.1501 and be established implemented and maintained consistent with the guidance in RGs 8.2, 8.8, and 8.10.

Trained and qualified radiation protection staff will routinely survey accessible areas in the plant and environs to assess the presence and levels of radiation, radioactive contamination, and airborne radioactivity. NEI 07-03 describes guidelines for frequency, extent and types of surveys to be performed; selection, calibration, maintenance and operational checks for radiation monitoring equipment; as well as recordkeeping requirements and posting guidelines associated with the performance of routine surveys. Emergency procedures will include provisions for use of appropriate equipment consistent with the criteria in NUREG-0737, Item III.D.3.3, to sample and analyze for radioiodine in areas of the plant during and following an accident. Emergency procedures will also describe methods for taking and analyzing samples during and following an accident.

3.5.2 Methods to Maintain Exposures ALARA

Methods to maintain exposures ALARA in accordance with RGs 8.8 and 8.10 will be included in radiation protection procedures, as well as applicable operating and maintenance procedures. Examples of the types of methods that will be used to maintain exposures ALARA are discussed for the following operational categories:

- Refueling
- In-service Inspection
- Radwaste Handling
- Spent Fuel Handling
- Normal Operation
- Routine Maintenance
- Sampling
- Calibration

Site or company specific information may be provided to describe alternate or additional procedures for maintaining exposures ALARA.

3.5.3 Posting and Labeling

NEI 07-03 states that procedures will be established, implemented and maintained for posting areas and labeling containers based on current radiation and/or contamination survey results, in accordance with the requirements of 10 CFR 20.1901, 20.1902, 20.1903, 20.1904, and 20.1905. This section of NEI 07-03 also defines “posted areas.”

3.5.4 Access Control

Procedures for access control will be consistent with the guidance in RG 8.38 and assure compliance with 10 CFR 20.1902, 20.1903, 20.1601 and 20.1602. As in alternative to demonstrating compliance with the controls specified in 10 CFR 20.1601(a) and (b), and in accordance with 10 CFR 20.1601(c), an applicant

may incorporate Standard Technical Specification Section 5.7, High Radiation Areas (References 5.4 and 5.5), into the TS cited in Section 16.0 of their DC and COL applications.

This section of NEI 07-03 describes how access to posted areas (Radiation Areas, High Radiation Areas, Very High Radiation Areas, Contaminated Areas, Radioactive Materials Areas and Airborne Radioactivity Areas) will be restricted and controlled. It also describes how individuals in need of unescorted access to posted areas will require instruction and training in accordance with 10 CFR 19.12 and consistent with the guidance provided in RGs 8.13, 8.27, and 8.29.

Posted areas will generally be contained within the plant Security Area, i.e. an area to which access is controlled in accordance with 10 CFR Part 73. A radiological controlled area (RCA) with access control points will be established to encompass the plant building complex to enhance control over access to such areas. Individual access to the security area, RCA, or a Radiation or Radioactive Materials Area will be at the discretion of Radiation Protection, require the use of a radiation work permit (RWP), and be contingent on the individual or an escort being instructed and trained in accordance with the requirements of 10 CFR 19.12 and the guidance in RGs 8.13, 8.27, and 8.29.

Each COL applicant will demonstrate compliance with 10 CFR 20.1602 by including in their application a description of each Very High Radiation Area and associated additional administrative controls for restricting access to each Very High Radiation Area. Site specific information that the applicant will provide to supplement the template, and which will be reviewed separately by the NRC staff, include:

- A description of each Very High Radiation Area, including reasons for accessing these areas.

- The location of each Very High Radiation Area in plant layout diagrams in FSAR Section 12.3-4.

- Anticipated frequency of accessing each of the Very High Radiation Areas, including a description of the additional administrative controls to be employed for restricting access to each Very High Radiation Area as required by 10 CFR 20.1602 and consistent with the guidance of RG 8.38.

- Detailed drawings for each Very High Radiation Area in FSAR Sections 12.3-4 that indicate physical barriers sufficient to thwart undetected entry, or an explanation of how such barriers to the Very High Radiation Areas will be verified in the final design of the facility.

3.5.5 Radiation Work Permits

Procedures governing the use of radiation work permits (RWPs) will be consistent with the guidance in RG 8.8. A radiation work permit, which is issued by Radiation Protection, will be required for access to and work within any posted area. NEI 07-03 describes the minimum amount of information that will be provided in each RWP.

3.5.6 Personnel Monitoring

NEI 07-03 states that personnel monitoring procedures will be in accordance with the requirements of 10 CFR Parts 19 and 20 and consistent with the guidance in RGs 8.2, 8.7, 8.9, 8.13, 8.34, 8.35, and 8.36.

This section of NEI 07-03 describes requirements for monitoring and reporting the external and internal occupational dose of individuals, along with requirements for documenting, reporting and maintaining personnel monitoring records, and documenting and maintaining records associated with the testing, calibration, processing, and maintenance of instrumentation and equipment used for personnel monitoring.

Individuals entering the Radiation Control Area (RCA) or a posted area that are required to be monitored in accordance with 10 CFR 20, will be monitored using an individual monitoring device appropriate to the external radiation he or she will be exposed to. If the individual monitoring device is not capable of providing real-time dose information, NEI 07-03 states that an additional method of monitoring the individual's dose will be provided such that real-time dose is known. Individuals accessing the RCA or a posted area on an escorted basis are monitored using an individual monitoring device worn by the individual or an individual monitoring device worn by the escort.

Each individual monitoring device that requires processing will be processed and evaluated by a National Voluntary Laboratory Accreditation Program (NVLAP)-accredited processor, except for those devices excluded by 10 CFR 20.1501(c). Each device will be processed and evaluated according to the types and ranges of radiation being monitored with the device.

Individuals whose internal dose is required to be monitored in accordance with 10 CFR Part 20, who have accessed an Airborne Radioactivity Area, or who wear a respirator for radiation protection purposes, will be monitored by means sufficient to identify and quantify intakes in order to estimate his or her internal dose (committed effective dose equivalent or committed dose equivalent). Individuals who are suspected of having received an intake will be evaluated to quantify the intake, if any, in order to estimate internal dose. Situations that may result in an abnormal or inadvertent intake are also evaluated for the need to monitor internal dose.

3.5.7 Dose Control

NEI 07-03 states that regulatory dose limits will be complied with by establishing, implementing and maintaining, to the extent practical, procedures and engineered controls based on sound RP principles in order to keep occupational doses and doses to members of the public ALARA. Procedures will be established that are in accordance with 10 CFR 20.1101 and consistent with the guidance in RGs 8.8, 8.10, and 8.35. Examples of such procedures are described in NEI 07-03 for construction, pre-operational and operational phases, and include procedures for design, plant modifications, equipment selection, maintenance, repair, surveillance, refueling, and other activities that may involve significant exposures.

3.5.8 Contamination Control

Contamination control procedures will be established by the COL holder for the purpose of preventing the unauthorized release of radioactive materials to unrestricted areas and to help assure compliance with 10 CFR Parts 20.1406 and 20.1701.

Areas, items and personnel will be routinely surveyed and monitored for contamination to protect personnel, ensure that contamination control methods are effective, and to prevent licensed materials from being released from an RCA or Controlled Area in an unauthorized manner. Other methods of controlling contamination, such as labeling contaminated areas and items, using protective clothing and equipment as appropriate to the circumstances to prevent personal contamination, decontaminating personnel, areas and items, limiting access to contaminated areas, and preventing cross contamination of nonradioactive systems will also be used as described in NEI 07-03. NEI 07-03 includes a listing of practical measures to prevent the spread of contamination.

3.5.9 Respiratory Protection

Respiratory protection procedures will assure compliance with 10 CFR 20, Subpart H, and will be established, implemented and maintained consistent with the guidance in RG 8.15 to cover the following activities:

- Monitoring, including air sampling and bioassays;
- Supervision and training of respirator users;
- Fit-testing;
- Respirator selection;
- Breathing air quality;
- Inventory, control, storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment;
- Recordkeeping; and
- Limitations on periods of use and relief from respirator use.

In addition, management policy will be established on the appropriate use of respiratory protection, as well as process and engineering controls to minimize airborne radioactivity. When the use of engineering controls as described in NEI 07-03 is not practical, the COL holder will control access to and limit stay times in Airborne Radioactivity Areas and/or require the use of respiratory protection equipment or other controls.

The COL holder will give the Radiation Protection Manager the responsibility of assigning to a single individual, knowledgeable in the area of respiratory protection consistent with the guidance in RG 8.15, the overall responsibility to establish and maintain a respiratory protection program and procedures that include the following:

- Air sampling and monitoring sufficient to identify hazards, select proper equipment, and determine doses from intakes;
- Conducting surveys and bioassays as necessary to evaluate actual intakes; and
- Testing respirators for operability immediately prior to each use.

In addition, the COL holder will select and use NIOSH or NRC approved respiratory equipment, will ensure individuals are medically certified for respiratory use prior to being fit-tested, will ensure individuals receive relief from respirator use as appropriate, will select and use respiratory protective equipment taking into account appropriate provisions as described in NEI 07-03, and will ensure standby rescue persons will be available for circumstances when respiratory protection equipment is used from which an unaided individual would have difficulty extricating himself or herself.

3.5.10 Radioactive Material Control

Procedures will be established, implemented and maintained to assure positive control over licensed radioactive material in accordance with the requirements of 10 CFR 20.1801, 20.1802, 20.1902, 20.1904, 20.1905, 20.1906, 20.2001, 20.2005, 20.2006, 20.2007, 20.2201, and 10 CFR 71.5

3.5.11 Radiation Protection Training

Prior to the initial receipt of by-product, source, or special nuclear materials (excluding Exempt Quantities as described in 10 CFR 30.18) procedures will be developed, implemented, and maintained that will assure that selection, qualification, initial training, and periodic retraining of radiation protection staff and radiation workers will be consistent with the guidance in RGs 1.8, 8.13, 8.15, 8.27, and 8.29 and be in accordance with 10 CFR 19, 20, and 10 CFR 50.120.

3.5.12 Quality Assurance

The radiation protection program and procedures will be established, implemented and reviewed under an ongoing quality assurance program consistent with the requirements of 10 CFR 20.1101 and site specific quality assurance criteria. The COL applicant will supplement NEI 07-03 with a reference to the appropriate section of their FSAR which contains the quality assurance criteria applicable to the Radiation Protection Program.

Consistent with the requirements in 10 CFR 71.101(f), quality assurance requirements will also apply to the program, procedures and activities involving the transportation of radioactive material.

3.5.13 Reports

Procedures will be established, implemented and maintained such that reports and notifications will be made in accordance with 10 CFR 20, Subpart M.

Based on the staff's review of the "Procedures" section of NEI 07-03 outlined above, the staff concludes that NEI 07-03 clearly and sufficiently describes, in terms of scope and level of detail, the procedures associated with: radiological surveillances, methods to maintain exposures ALARA, posting and labeling, access control, radiation work permits, personnel monitoring, dose control, contamination control, respiratory protection, radioactive material control, radiation protection training, quality assurance, and reports, to enable the staff to make a reasonable assurance finding of acceptability for issuance of a COL with verification, during the construction stage, of an operational

radiation protection program which complies with the applicable regulations and guidance.

4.0 CONCLUSION

Health Physics Branch (CHPB) staff used the acceptance criteria of SRP Section 12.5 as the basis for evaluating the acceptability of NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description," Revision 7. The CHPB staff has determined that NEI 07-03 is consistent with the regulatory requirements, guidance, and industry standards for operational radiation protection programs as outlined in Section 2.0 of this evaluation, with implementation in accordance with the 4 milestones described in Section 3.0, and verification of the program during the construction stage.

The objectives of the radiation Protection Program are to provide reasonable assurance that the limits of 10 CFR 20.1201, 10 CFR 20.1202, 10 CFR 20.1203, 10 CFR 20.1204, 10 CFR 20.1207, and 10 CFR 20.1208 will not be exceeded; 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 ALARA, in accordance with the requirements of 10 CFR 20.1003 and the guidelines of RGs 8.8 and 8.10.

The Radiation Protection Manager (or equivalent), will report directly to the Plant Manager, independent of the reporting chains for Operations and Maintenance. The duties of the plant Radiation Protection Manager are in accordance with the guidance in RGs 8.8 and 8.10. The radiation protection organizations, qualifications, personnel training, program objectives, and implementation methods, as described in NEI 07-03, will be in accordance with the guidance in RGs 1.8, 8.2, 8.8, 8.10, and 8.13 and will comply with 10 CFR 19.12 and the Technical Specifications (Section 5.1, Organization, and Section 5.4, Procedures) cited in Section 16.0 of the DC and COL applications [References 5.4 and 5.5].

The radiation protection facilities described in NEI 07-03 are in accordance with the guidelines contained in RG 8.8.

Equipment to be used for radiation protection purposes includes portable radiation survey instruments, personnel monitoring equipment, portable area and airborne radioactivity monitors, laboratory equipment, air samplers, respiratory protective equipment, and protective clothing. The template commits the applicant to providing adequate numbers and types of equipment, and providing accident instrumentation that meet the criteria of RG 1.97 and SRP BTP 7-10, such that NRC staff have reasonable assurance that the applicant will be able to maintain occupational exposures ALARA.

All permanent and temporary plant personnel will be assigned individual personnel dosimeters to be worn in restricted areas at all times. A processor accredited under NVLAP will process these badges as appropriate. All personnel who are required to be monitored must wear direct reading dosimeters when entering radiologically controlled areas. 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, 10 CFR 20.1602, 10 CFR 20.1901, 10 CFR 20.1902, 10 CFR 20.1903, 10 CFR 20.1904, and 10 CFR 20.1905. Neutron film badges, neutron dosimeters, and alarm dosimeters will also be provided for personnel when necessary.

Whole body counts of all plant personnel as well as other bioassays will be provided when deemed necessary by the Radiation Protection Manager (or equivalent), in order to maintain doses below the limits specified in 10 CFR 20.1201, 10 CFR 20.1202, 10 CFR 20.1203, 10 CFR 20.1204, 10 CFR 20.1206, 10 CFR 20.1207, and 10 CFR 20.1208. Performance, recording and reporting of surveys, personnel monitoring, and bioassays, as well as maintaining records of waste disposal, will be conducted in accordance with 10 CFR 20.1501, 10 CFR 20.1502, 10 CFR 20.2101-20.2108, 20.2110, 10 CFR 20.2201, 20.2202, 20.2203, 20.2204, 20.2205 and 10 CFR 20.2206, as well as RG 8.7. All radiation exposure information will be processed and recorded in accordance with 10 CFR Part 20.

The staff reviewed the Template NEI 07-03 description of maintenance, repair, surveillance, and refueling procedures and methods to ensure that all plant radiation protection procedures, practices, and criteria have been considered and that occupational radiation exposures will be ALARA and in accordance with RG 8.8. Procedures will also be developed to ensure that plant or visitor personnel to the site do not exceed exposure limits, 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. Procedures will be established, implemented and reviewed under an ongoing quality assurance program consistent with the requirements of 10 CFR 20.1101 and 10 CFR 71.101.

Storage and control of licensed materials in unrestricted areas will be maintained in accordance with 10 CFR 20.1801, 10 CFR 20.1802, 10 CFR 20.1901, and 10 CFR 20.1902. Access control to high radiation areas will be maintained in accordance with 10 CFR 20.1601. As an alternative to compliance with 10 CFR 20.1601(a) and (b), the applicant may choose to incorporate Section 5.7, “High Radiation Areas, of the Standard Technical Specifications” [References 5.4 and 5.5] into the technical specifications cited in Section 16.0 of their DC and COL applications. Compliance with the very high radiation area controls specified in 10 CFR 20.1602 will be demonstrated by additional information to be provided by the COL applicant.

On the basis of its review, the staff concludes that NEI 07-03, “Generic FSAR Template Guidance for Radiation Protection Program Description,” Revision 7, as supplemented by the COL applicant, sufficiently describes the programmatic elements and operational objectives to enable a reasonable assurance finding of acceptability for issuance of a COL, followed with verification of the implementation of a site and plant-specific operational radiation protection program through the inspection process prior to fuel load. The staff further concludes that NEI 07-03 is adequate and may be referenced in a COL application, and that the implementation of a plant and site-specific operational radiation protection program will be executed by COL holders in accordance with the milestones described in COL Safety Analysis Report Section 13.4 and the associated license conditions.

Accordingly, the NEI 07-03 Template fulfills a licensing requirement for submission of a COL application. A license condition will specify the timing for the licensee to make elements of the site and plant-specific operational radiation protection program available for NRC inspection and verification. Finally, under the requirements of SECY 05-0197, the implementation of operational programs identified in the NEI 07-03 Template does not necessitate inspection, test, analysis, and acceptance criteria in a DC or COL application.

5. REFERENCES

5.1 NEI New Plant Radiation Protection Task Force, Nuclear Energy Institute, to the U.S. NRC, NEI 07-03, " Generic FSAR Template Guidance for Radiation Protection Program Description," November 2008.

5.2 NUREG-0800, "SRP," Section 12.5, "Operational Radiation Protection Program," March 2007.

5.3 RG 1.206, "Combined License Applications for Nuclear Power Plants," Section 12.5, "Operational Radiation Protection Program," June 2007.

5.4 NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," Revision 3, June 2004.

5.5 NUREG-1434, "Standard Technical Specifications for General Electric Plants, BWR/6," Revision 3, June 2004.

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