NUREG-1700

# Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans

## Final Report

U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Washington, DC 20555-0001

# AVAILABILITY NOTICE

## Availability of Reference Materials Cited in NRC Publications

NRC publications in the NUREG series, NRC regulations, and *Title 10, Energy,* of the *Code of Federal Regulations,* may be purchased from one of the following sources:

1. The Superintendent of Documents
   U.S. Government Printing Office
   P.O. Box 37082
   Washington, DC 20402–9328
   <http://www.access.gpo.gov/su_docs>
   202–512–1800

2. The National Technical Information Service
   Springfield, VA 22161–0002
   <http://www.ntis.gov>
   1–800–553–6847 or locally 703–605–6000

The NUREG series comprises (1) brochures (NUREG/BR-XXXX), (2) proceedings of conferences (NUREG/CP-XXXX), (3) reports resulting from international agreements (NUREG/IA-XXXX), (4) technical and administrative reports and books [(NUREG-XXXX) or (NUREG/CR-XXXX)], and (5) compilations of legal decisions and orders of the Commission and Atomic and Safety Licensing Boards and of Office Directors' decisions under Section 2.206 of NRC's regulations (NUREG-XXXX).

A single copy of each NRC draft report for comment is available free, to the extent of supply, upon written request as follows:

Address: Office of the Chief Information Officer
Reproduction and Distribution
Services Section
U.S. Nuclear Regulatory Commission
Washington, DC 20555–0001
E–mail: <DISTRIBUTION@nrc.gov>
Facsimile: 301–415–2289

A portion of NRC regulatory and technical information is available at NRC's World Wide Web site:

<http://www.nrc.gov>

After January 1, 2000, the public may electronically access NUREG-series publications and other NRC records in NRC's Agencywide Document Access and Management System (ADAMS), through the Public Electronic Reading Room (PERR), link <http://www.nrc.gov/NRC/ADAMS/index.html>.

Publicly released documents include, to name a few, NUREG-series reports; *Federal Register* notices; applicant, licensee, and vendor documents and correspondence; NRC correspondence and internal memoranda; bulletins and information notices; inspection and investigation reports; licensee event reports; and Commission papers and their attachments.

Documents available from public and special technical libraries include all open literature items, such as books, journal articles, and transactions, *Federal Register* notices, Federal and State legislation, and congressional reports. Such documents as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings may be purchased from their sponsoring organization.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, Two White Flint North, 11545 Rockville Pike, Rockville, MD 20852–2738. These standards are available in the library for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from—

American National Standards Institute
11 West 42nd Street
New York, NY 10036–8002
<http://www.ansi.org>
212–642–4900

NUREG-1700

# Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans

## Final Report

Manuscript Completed: April 2000
Date Published: April 2000

Prepared by
C. L. Pittiglio

**Division of Waste Management**
**Office of Nuclear Material Safety and Safeguards**
**U.S. Nuclear Regulatory Commission**
**Washington, DC 20555-0001**

# ABSTRACT

This standard review plan (SRP) guides NRC staff in performing safety reviews of license termination plans (LTPs). Although interested parties can use it for conducting their own licensing reviews or developing an LTP, the principal purpose of the SRP is to ensure the quality and uniformity of NRC staff reviews and to present a well-defined base from which to evaluate the requirements for terminating the license of a nuclear power plant. It is also the purpose of the SRP to make the information about regulatory matters widely available in order that interested members of the public and the nuclear industry gain a better understanding of the staff's review process. Each SRP presents the acceptance criteria for all areas of review for license termination. The SRP identifies the matters to be reviewed, the basis for the review, and the conclusions that are sought.

# CONTENTS


| | Page |
|---|---|
| Abstract | iii |
| Abbreviations | vii |
| A. Introduction | 1 |
| 1. Area of Review | 3 |
| 2. Acceptance of Criteria | 3 |
| 3. Evaluation Findings | 3 |
| 4. Implementation | 3 |
| 5. References | 3 |
| B. LTP Standard Review Plan and Acceptance Criteria | 4 |
| 1. General Information | 4 |
| 2. Site Characterization | 4 |
| 3. Identification of Remaining Site Dismantlement Activities | 5 |
| 4. Remediation Plans | 5 |
| 5. Final Radiation Survey Plan | 6 |
| 6. Compliance With the Radiological Criteria for License Termination | 8 |
| 7. Update of the Site-Specific Decommissioning Costs | 14 |
| 8. Supplement to the Environmental Report | 15 |
| C. Evaluation Findings | 16 |
| D. Implementation | 18 |
| E. References | 19 |
| F Summary of Public Comments on Draft | 20 |

# ABBREVIATIONS

| | |
|---|---|
| ALARA | as low as is reasonably achievable |
| CFR | *Code of Federal Regulations* |
| DCGL | derived concentration guidelines |
| DG | draft regulatory guide |
| EPA | Environmental Protection Agency |
| FR | *Federal Register* |
| FSAR | final safety analysis report |
| ISFSI | independent spent fuel storage installation |
| LTP | license termination plan |
| NMSS | Office of Nuclear Material Safety and Safeguards |
| NRC | Nuclear Regulatory Commission |
| PGEC | Portland General Electric Company |
| PSDAR | post-shutdown decommissioning activities report |
| QA | quality assurance |
| RAI | request for additional information |
| SE | safety evaluation |
| SRP | standard review plan |
| TEDE | total effective dose equivalent |

## A. Introduction

On July 29, 1996, the Commission published amendments to its regulations in 10 CFR Parts 2, 50, and 51 (Ref. 1), prescribing specific criteria for decommissioning nuclear power reactors, effective August 28, 1996. This rule, by eliminating, revising, or extending operating reactor requirements commensurate with the importance to safety, specifies requirements for reactors that are permanently shut down and have no fuel in the reactor vessel. Such reactors present a significantly reduced risk to the public.

Decommissioning activities for power reactors may be divided into three phases: (1) initial activities, (2) major decommissioning and storage activities, and (3) license termination activities. Draft Regulatory Guide DG–1067, "Decommissioning of Nuclear Power Reactors" (Ref. 2), is being developed to describe methods and procedures that are acceptable to the U.S. Nuclear Regulatory Commission (NRC) staff for implementing the rules that relate to the initial activities and the major phases of decommissioning.

For Phase 3, 10 CFR 50.82(a)(9) specifies that an application for license termination must be accompanied or preceded by a license termination plan (LTP), which is subject to NRC review and approval. According to 10 CFR 50.82(a)(9)(i), the licensee must submit an LTP at least 2 years before termination of the license. The LTP approval process is by license amendment. A public meeting must be held near the site; any hearing held in relation to the LTP would fall under either Subpart G or Subpart L of 10 CFR Part 2. If the fuel has been permanently removed from the Part 50 license to an authorized facility, a hearing on the proposed LTP would be in accordance with Subpart L. Conversely, if an LTP were submitted while the spent fuel was stored in accordance with the Part 50 license, Subpart G of 10 CFR Part 2 would apply.

On July 21, 1997, the Commission amended its regulations in 10 CFR Parts 20, 30, 40, 50, 51, 70, and 71 (Ref. 3), prescribing specific radiological criteria for license termination. "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4), presents additional guidance on how to demonstrate compliance with the unrestricted release, restricted release, and alternate criteria for license termination in accordance with Subpart E of 10 CFR Part 20. Although "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4) was developed so that a licensee would better understand the NRC's requirements for decommissioning nuclear facilities licensed under Part 30, 40, 70, or 72, some of the modules are applicable to decommissioning nuclear power reactors, and are referenced in specific sections of this SRP.

Under the new regulations in the LTP, a licensee may propose either

- release of the facility and site for unrestricted use or
- release of the facility and site under restricted-use conditions.

Because the status of decommissioning of the facility will vary significantly depending on when the licensee elects to submit the LTP, the information required to be submitted in the LTP will vary, and the licensee should have the flexibility to adjust the information submitted to reflect the status of the decommissioning completed at the facility.

For the most part, the LTP will contain a final site characterization, a dose assessment, identification of the remaining remediation activities and supporting plan, and a final survey plan. The LTP must be submitted as a supplement to the licensee's final safety analysis report (FSAR) or as an equivalent document. A licensee might submit the LTP concurrently with the post-shutdown decommissioning activities report (PSDAR). Guidance on the content of the PSDAR can be found in draft Regulatory Guide DG–1071, "Standard Format and Content Guide for Post-Shutdown Decommissioning Activities Report" (Ref. 5).

Currently, the Office of Nuclear Material Safety and Safeguards (NMSS), Division of

Waste Management, Decommissioning Branch, is responsible for reviewing the LTP and developing this Standard Review Plan (SRP).

This SRP guides staff reviewers in NMSS on performing safety reviews of LTPs. Although the SRP is intended to be used by the NMSS staff in conducting reviews, it can be used by interested parties responsible for conducting their own licensing reviews or developing an LTP. The principal purpose of the SRP is to ensure the quality and uniformity of staff reviews and to present a well-defined base from which to evaluate the requirements. It is also the purpose of the SRP to make the information about regulatory matters widely available to improve the understanding of the staff's review process by interested members of the public and the nuclear industry.

The review is primarily based on the information submitted by an applicant in the LTP. The LTP must be sufficiently detailed to permit the staff to independently verify that the facility can be decommissioned safely, and the license can be terminated. The specific information that the staff needs in order to evaluate an LTP is identified in Regulatory Guide 1.1.79, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors" (Ref. 6). The individual SRPs are keyed to Regulatory Guide 1.179.

Because the NRC has initiated a streamlined approach for licensing actions, when a licensee submits an LTP to the NRC for review and approval, the staff will use this SRP to evaluate the information submitted by licensees to support the evaluation of the decommissioning of facility. The staff's review will include (1) acceptance reviews, (2) detailed reviews, (3) requests for additional information (RAIs), and (4) safety and environmental reports. The staff shall ensure the application is complete (acceptance review), and if it is not, return it to the licensee. If the application is complete, staff will then conduct its detailed review, and prepare its preliminary technical evaluation. Through this process, staff will be able to identify areas in which questions need to be asked. This approach will help ensure that questions are limited to those areas in which additional information is truly needed, and should help result in only one round of questions.

The acceptance review consists of the staff reviewing the proposed LTP plan for completeness in accordance with this SRP. If the licensee's information is inadequate or incomplete, the staff should request that the licensee supply additional information. The staff may recommend that the request (1) be rejected because of inadequate information, (2) be placed on hold pending submittal of requested information, or (3) accepted for docketing. If the request is docketed, the detailed review of the request will begin. In performing the acceptance review, the staff should use the information requirements summarized in the "General Information" section of this SRP as a basis for reviewing the information.

The detailed qualitative and quantitative review consists of the staff determining whether the licensee has met the requirements of the individual SRP modules. The staff will verify that the licensee has submitted all of the information described in Regulatory Guide 1.179 applicable to the site, and that this information meets the guidance discussed in the "Acceptance Criteria" sections of each SRP.

The staff should structure its reviews so that the number of requests for additional information (RAIs) is minimized, without diminishing the technical quality or completeness of the licensee's ultimate submittal. For example, the staff should first develop a set of additional information needs and clarifications and then meet with the licensee or responsible party to discuss the issues. This meeting would be noticed and conducted in accordance with NRC requirements and be documented in a meeting summary report. Any issues that could not be resolved during the meeting would be included in the formal RAI. In developing the final RAI, staff should document the insufficient or inadequate information submitted by the licensee and communicate what additional

information is needed to address the identified deficiencies.

Safety and environmental review reports document the staff's position on the safety and environmental acceptability of licensee's request, which forms the basis for the subsequent licensing action and document the evaluation findings.

Once the LTP is approved, one mechanism to address changes to the LTP is for the licensee to identify in the license amendment request any changes. These changes, in addition to those identified in 10 CFR 50.82(a)(6), would require NRC approval by license amendment. Although the change would require approval by license amendment, this approach clearly defines what requires NRC approval.

The SRP is written to cover a variety of license termination conditions. Each section of this SRP presents the acceptance criteria for all areas of review for license termination. The SRP identifies the matters to be reviewed, the basis for the review, and the conclusions that are sought.

Each SRP is divided into the following sections: (1) Area of Review, (2) Acceptance Criteria, (3) Evaluation Findings, (4) Implementation, and (5) References.

**(1) Area of Review**

Each subsection in Section B, "LTP Standard Review Plan and Acceptance Criteria," summarizes the purpose of the review and the applicable NRC requirements. The initial summary is not designated "Area of Review," as described in detail in Regulatory Guide 1.179.

**(2) Acceptance Criteria**

This section contains the technical bases for determining the acceptability of analysis or of the program. The technical bases may consist of specific criteria, such as NRC regulatory guides, industry codes and standards, and branch technical positions. These approaches are codified in this form so the staff can take consistent positions on similar problems as they arise. Branch technical positions present approaches that are acceptable to the staff for demonstrating compliance with NRC regulatory requirements, but that are not considered as the only possible approaches. Applicants proposing approaches to problems other than those described in the branch technical positions may expect longer review times and more extensive questioning in these areas.

**(3) Evaluation Findings**

This section presents the type of conclusion that is sought for the particular review area. For each SRP, a conclusion of this type will be included in the safety evaluation (SE). The SE also will contain a description of the review, including aspects of the review that were selected or emphasized, and the bases for any deviation from the SRP.

**(4) Implementation**

This section explains how and when the staff will implement the SRP and acceptance criteria.

**(5) References**

This section lists the references that are applicable to the review process.

## B. LTP Standard Review Plan and Acceptance Criteria

### 1. General Information

The LTP table of contents should address each of the following 10 CFR 50.82(a)(9) criteria, and the 10 CFR Part 20, Subpart E related radiological criteria for unrestricted or restricted release of the site, with any supporting information. The regulations applicable to this review are 10 CFR 50.82(a)(9), 10 CFR 50.82(a)(10), and 10 CFR Part 20, Subpart E.

**Acceptance Criteria**

The LTP is submitted in the form of a supplement to the FSAR and the LTP has been preceded by or accompanied by an application for license termination.

The LTP is submitted 2 years or more before the termination date of the license.

The LTP is submitted in the form of a license amendment request.

The LTP lists the licensee's name and address, license number, and docket number, and that information agrees with the most recent license.

The LTP addresses each of the following 10 CFR 50.82(a)(9) criteria, and the 10 CFR Part 20, Subpart E, radiological criteria for unrestricted or restricted release of the site:

- site characterization,
- identification of remaining site dismantlement activities,
- plans for site remediation,
- detailed plans for final radiation surveys for release of the site, and
- method for demonstrating compliance with the radiological criteria for license termination.
- For restricted release, the LTP should contain a description of the site's end use, documentation on public consultation, institutional controls, and financial assurance needed to comply with the requirements for license termination for restricted release or alternate criteria greater than the dose criterion of 10 CRR 20.1402, 1403(b) and 1403(d)(1)(A) for terminating a license provided the licensee meets the requirements of 10 CFR 20.1404.
- updated site-specific estimate of remaining decommissioning costs and
- supplement to the environmental report, pursuant to 10 CFR 51.53(d), that describes any new information or significant environmental changes associated with the licensee's proposed termination activities.

### 2. Site Characterization

Site characterization is provided to determine the extent and range of radioactive contamination on site, including structures, systems, components, residues, soils, and surface and ground water. On the basis of the site characterization, the final surveys are conducted to cover all areas in which contamination previously existed, remains, or has the potential to remain. The licensee should also use the site characterization information to develop input to the dose modeling. As part of the review, the NRC staff should review the licensee's site characterization plans and site records (required under 10 CFR 50.75(g)) to ensure that the site characterization presented in the LTP is complete and that the data were obtained with sufficiently sensitive instruments and using proper quality assurance procedures to obtain reliable data applicable to determining if the site will meet the decommissioning limits. The regulation applicable to this area of review is 10 CFR 50.82(a)(9)(ii)(A).

**Acceptance Criteria**

The LTP identifies all locations, inside and outside the facility, where radiological spills,

disposals, operational activities, or other radiological accidents/incidents that occurred and could have resulted in contamination of structures, equipment, laydown areas, or soils (subfloor and outside area).

The LTP describes, in a summary form, the original shutdown and current radiological and non-radiological status of the site.

The LTP site characterization is sufficiently detailed to allow NRC to determine the extent and range of radiological contamination of structures, systems (including sewer systems and waste management systems), floor drains, ventilation ducts, piping and embedded piping, rubble, contamination on and beneath paved parking lots, ground water and surface water, components, residues, and environment, including maximum and average contamination levels and ambient exposure rate measurements of all relevant areas (structures, equipment, and soils) of the site.

The LTP should identify the survey instruments and supporting quality assurance practices used in the site characterization program.

The LTP is sufficiently detailed to provide data for planning further decommissioning activities, which includes decontamination techniques, projected schedules, costs, waste volumes, dose assessments (including ground-water assessments), and health and safety considerations.

## 3. Identification of Remaining Site Dismantlement Activities

The LTP describes the remaining site dismantlement activities. The staff will review the information supplied by the licensee to determine if the description of the current radiological status of the facility is adequate to allow the staff to fully understand the types and levels of radioactive material contamination and the extent of radioactive material contamination at the facility. The staff will use this information during its review of the licensee's decommissioning activities, to evaluate the cost of estimates for decommissioning, and decommissioning health and safety plans. The regulation applicable to this area of review is 10 CFR 50.82(a)(9)(ii)(B).

**Acceptance Criteria**

The LTP discusses the remaining tasks associated with the decontamination and dismantlement, estimates the quantity of radioactive material to be shipped for disposal or processing, describes the proposed control mechanisms to ensure areas are not recontaminated, and contains occupational exposure estimates and radioactive waste characterization.

The LTP describes in detail the areas and equipment that need further remediation to allow the reviewer to estimate the radiological conditions that will be encountered during remediation of equipment, components, structures, and outdoor areas.

The LTP describes the remaining dismantlement activities in sufficient detail for NRC to identify any inspection or technical resources needed during the remaining dismantlement activities.

The LTP information is sufficient to allow the NRC staff to evaluate the potential safety issues associated with remediating the structures, and to determine whether the remediation activities and radiation control measures proposed by the licensee are appropriate for the type of radioactive material present in the structure, whether the licensee's waste management practices are appropriate, and whether the licensee's cost estimates are plausible given the amount of contaminated material that will need to be removed or remediated.

The LTP contains a listing of any remaining activities that involve unreviewed safety questions or changes in a facility's technical specifications.

## 4. Remediation Plans

The LTP discusses in detail how facility areas and site areas will be remediated to meet NRC release criteria. The regulations applicable to

this area of review are 10 CFR 50.82(a)(9)(ii)(C) and 10 CFR Part 20, Subpart E (Ref. 3). The LTP should include descriptions of how the licensee intends to remediate structures, systems and equipment, surface and subsurface soil, and surface and groundwater at the site. In addition, the licensee should submit a schedule that demonstrates how the licensee will complete the interrelated decommissioning activities and the time frames for completing the decommissioning.

**Acceptance Criteria**

The LTP addresses any changes in the radiological controls to be implemented for the control of radiological contamination associated with remaining decommissioning and remediation activities.

The LTP discusses in detail how facility areas and site areas will be remediated to meet the NRC criteria for license termination in Subpart E of 10 CFR Part 20 (Ref. 3). Discussions should focus on techniques or procedures used to evaluate the effectiveness of remediation (such as scabbing, hydrolazing, or grit blasting), and including any computer modeling programs. Discussions should focus on how the licensee intends to remediate structures, systems and equipment, surface and suburface soil, and surface and ground water at the site.

The LTP summarizes the remediation tasks planned for each room or area in the contaminated structure in the order in which they will occur.

The LTP summarizes the radionuclides, maximum activities of radionuclides, and radiation levels in each area or room of the contaminated structure.

If the licensee intends to dismantle structures with contamination present in excess of the unrestricted use limits, the LTP should summarize separately the information listed above for the areas containing contamination in excess of the unrestricted use limits. In addition, the licensee or responsible party should describe the techniques and procedures that will be used to dismantle the building or structure and the licensee's procedures for evaluating the areas preceding dismantlement.

If the end use of the site is for restricted release, the LTP should discuss, in detail, dose-modeling projections and institutional controls to be put into place over the site.

## 5. Final Radiation Survey Plan

The LTP describes the final survey plan for confirming that the plant and site will meet the restricted or unrestricted release criteria. The regulations applicable to this area of review are 10 CFR 50.82(a)(9)(ii)(D) and 10 CFR 20.1501(a) and (b). The final status survey is the radiation survey performed after an area has been fully characterized, remediation has been completed, and the area is ready to be released. The purpose of the final status survey is to demonstrate that the area conforms to the radiological criteria for license termination. This section of the SRP endorses the final survey status methods described in "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4), as appropriate, for demonstrating compliance with Subpart E of 10 CFR Part 20.

**Acceptance Criteria**

The LTP is acceptable if the final survey plan addresses certain items, in a manner consistent with "Radiological Criteria for License Termination Standard Review Plan." Some of the items are

- the methods proposed for surveying all equipment, systems, structures, and soils (diagrams, plot plans, and facility layout drawings should be used to facilitate presentation), as well as a method for ensuring that sufficient data are included for a meaningful statistical survey;
- the methods to be used to establish background radiation levels;
- the quality assurance (QA) program, to support both field survey work and laboratory analysis, that addresses the QA organization; training and qualification requirements; survey instructions and

procedures, including water, air, and soil sampling procedures; document control; control of purchased items; inspections; control of survey equipment; handling, storage, calibration, and response checks; shipping of survey equipment and laboratory samples; nonconformance items; corrective action; QA records; and the survey audits, including methods to be used for reviewing, analyzing, and auditing data;

- operational and characterization surveys and evaluations used to support delineation of radiologically impacted (contaminated) areas and nonimpacted (noncontaminated) areas;
- the derived concentration guidelines (DCGLs) and how multiple DCGLs will be addressed in survey planning and design;
- the field instruments and methods that will be used for measuring concentrations and the sensitivities of those instruments and methods;
- the method used to reclassify a survey unit;
- how any changes will be made in the final status survey from what is proposed in the LTP;
- the values used to determine the number of samples and a justification for selecting these values;
- the methodology that will be used to determine the area to be scanned for Class 2 and Class 3 survey units;
- the major radiological contaminants;
- methods used for addressing hard-to-detect radionuclides; and
- access control procedures to control recontamination of clean areas.

The LTP is acceptable if the licensee's final radiation survey plan describes the scope of the survey and the general procedures followed, including survey procedures to ensure that the survey techniques and instrument sensitivity are appropriate for measuring the major radiological contaminants identified, and how the plan will demonstrate that the plant and site will meet criteria for release for license termination.

The LTP is acceptable if the licensee has appropriately divided the survey area into survey units, or, at a minimum, commits to a maximum area for each survey unit, identifies the number of measurements per unit, and presents the basis for the area classification.

The LTP is acceptable if the final survey plan, consistent with draft Regulatory Guide DG–4006, identifies the scanning to be performed to locate small areas of elevated concentrations of residual radioactivity to determine whether they meet the radiological criteria for license termination; commits to perform scanning in each survey unit to detect areas of elevated concentrations; and establishes investigation levels for investigating significantly elevated concentrations of residual radioactivity.

The LTP is acceptable if the final survey plan addresses the presence of subsurface residual radioactivity. Subsurface residual radioactivity is mainly determined by the historical site assessment, with knowledge of how the residual radioactivity was deposited.

The LTP should contain a summary of the structures and locations at the facility that have not been impacted by licensed operation and the basis for that conclusion.

For areas that have been impacted by licensed operation, the LTP should contain a summary of the structures and locations at the facility, including (1) a list or description of each room or work area within each of these structures; (2) a summary of the background levels used during scoping or characterization surveys; (3) a summary of the locations of contamination (i.e., walls, floors, wall/floor joints, structural steel surfaces, ceilings, etc.) in each room or work area; (4) a summary of the radionuclides present at each location, the maximum and

average radionuclide activities in dpm/100cm$^2$, and, if multiple radionuclides are present, the radionuclide ratios; (5) the mode of contamination for each surface (i.e., whether the radioactive material is present only on the surface of the material or if it has penetrated the material); (6) the maximum and average radiation levels in mrem/hr in each room or work area; and (7) a scale drawing or map of the rooms or work areas showing the locations of radionuclide material contamination.

The LTP final survey plan is acceptable if the licensee establishes or commits to establish a reference coordinate system for the survey areas. A reference coordinate system is a set of intersecting lines referenced to a fixed site location or benchmark. Reference coordinate systems are established so that the locations of any point in the survey unit can be identified by coordinate numbers. A reference coordinate system does not establish the number of sample points or determine where samples are taken. A single reference coordinate system may be used for a site, or different coordinate systems may be used for each survey unit or for a group of survey units.

## 6. Compliance With the Radiological Criteria for License Termination

The licensee needs to clearly present in the LTP the radiological criteria proposed for license termination. If a licensee desires an unrestricted release per 10 CFR Part 20, Subpart E (Ref. 3), the licensee should describe the methods used to demonstrate compliance. If a licensee requests license termination under the restricted release criteria per Subpart E of 10 CFR Part 20 (Ref. 3), the LTP should describe in detail how the requirements of 10 CFR 20.1403 and 10 CFR 50.82(a)(9)(ii)(E) will be met. If a licensee requests license termination under the alternate radiological criteria in 10 CFR 20.1404, the LTP should describe how the requirements in 10 CFR 20.1301(a)(1), 10 CFR 20.1404, and 10 CFR 50.82(a)(9)(ii)(E) will be met.

This section of the SRP endorses the status methods described in "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4.), as appropriate, for demonstrating compliance with Subpart E of 10 CFR Part 20.

NUREG–1549, "Decision Methods for Dose Assessment To Comply With Radiological Criteria for License Termination—Draft Report for Comment" (Ref. 7) contains guidance on dose assessment and identifies the following six key components that should be addressed in dose assessments: (1) determining the source inventory, (2) defining future land-use scenarios, (3) identifying exposure pathways, (4) developing conceptual models, (5) calculating the dose, and (6) evaluating uncertainty and sensitive parameters.

As required under 10 CFR 20.1302(b), expected doses are evaluated for the average member of the critical group, which is not necessarily the same as the maximally exposed individual. This is not a reduction in the level of protection provided to the public, but an attempt to better characterize the uncertainty and assumptions needed in calculating potential future doses, while limiting boundless speculation on possible future exposure scenarios. The use of the "average member of the critical group" acknowledges that any hypothetical "individual" used in the performance assessment is based, in some manner, on the statistical results from data sets (e.g., the breathing rate is based on the range of possible breathing rates) gathered from groups of individuals. Calculating the dose to the critical group is intended to bound the individual dose to other possible exposure groups because the critical group is a relatively small group of individuals, due to their habits, actions, and characteristics, who could receive among the highest potential dose at some time in the future. By using the hypothetical critical group as the dose receptor, coupled with prudently conservative models, it is highly unlikely that any individual would actually receive doses in excess of that calculated for the average member of the critical group. The description of a critical group's habits, actions, and characteristics should be based on credible assumptions and the information or

data ranges used to support the assumptions should be limited in scope to reduce the possibility of adding members of less exposed groups to the critical group. An analysis of the average member of the critical group's potential exposure should also include, in most cases, some measure of the uncertainty in the parameter values used to represent physical properties of the environment.

**Acceptance Criteria**

For unrestricted release, the LTP is acceptable if

- The licensee demonstrates that the dose from residual radioactivity that is distinguishable from background radiation results in a total effective dose equivalent (TEDE) to an average member of the critical group (DCGL, the derived concentration guideline) that does not exceed 25 mrem (0.25 mSv) per year over a 1000-year period, including the dose from groundwater sources of drinking water.

- The LTP describes in detail the methods and assumptions used to demonstrate compliance with the 25-mrem-per-year criterion. "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4), presents additional guidance, acceptable to the NRC staff, on how to demonstrate compliance with the unrestricted release criteria. It also contains guidance on conducting dose modeling, use of generic screening methods, use of site-specific parameter values and alternate models, use of computer models, and methods for conducting a final survey.

- The LTP describes acceptable methods for calculating DCGL values, methods for calculating site-specific DCGL values for buildings and soil, methods for calculating area factors for use with the elevated measurement comparison, and methods for handling special circumstances in buildings and soils. Licensees or responsible parties may not use a screening analysis approach at sites exhibiting any of the following conditions (excluding those caused by sources of background radiation): (1) soil contamination greater than 6 inches below the ground surface; (2) radionuclide residual radioactivity presently an aquifer; (3) buildings with volumetrically contaminated material; or (4) radionuclide concentrations in surface water sediments.

- The LTP includes justification for the use of the default scenarios and parameters for the DandD code consisting of a statement that no other conditions are reasonably expected to exist at the site except for those incorporated in the default scenarios and modeling assumptions, that would cause a significant increase in the calculated dose. If DandD is used to estimate the DCGL, the licensee should send the NRC a copy of the report produced by DandD to verify the version of DandD that was used in the analysis. Information on site characterization should be submitted to show that DandD is applicable for the site conditions.

- The LTP demonstrates compliance by using NRC's screening models and parameter values, and progression to more site-specific analysis is unnecessary. The licensee need only provide site-specific final status survey results that are compared with the generic DCGL. If other computer models are used to estimate the DCGL, the licensee should provide sufficient information to the NRC to allow review of the model, scenarios, and parameters. The licensee has the flexibility to change the DCGLs once the LTP is approved: however, the change would require NRC approval and would be accomplished through a license amendment request.

- The LTP demonstrates compliance by using site-specific information to derive DCGLs, the licensee should justify the site-specific parameter values and alternate models. The licensee has the

flexibility to change the DCGLs once the LTP is approved: however, the change would require NRC approval and would be accomplished through a license amendment request. Site-specific scenarios to calculate doses from residual radioactivity in soil should describe the reasonable land uses and human activities for the future, following license termination. It is reasonable to assume that current land uses in the area will be continued for the period of the dose assessment (1000 years). If a site-specific scenario or screening group will be used for structures, a description of the reasonable use of the structure after license termination for the projected lifetime of the structure should be provided. If the lifetime cannot be estimated, 70 years may be used.

- The LTP demonstrates whether it is feasible to further reduce the levels of residual radioactivity to levels below those necessary to meet the dose criteria (i.e., to levels that are as low as is reasonable achievable[ALARA]).

- The LTP confirms that the actual measurements or facility history support the source term configuration used in the modeling by comparing the information in this section with that in the facility history, radiological status, and planned remedial action(s).

- The LTP demonstrates that the depth of penetration of the residual radioactivity into the building surfaces is a thin layer of residual radioactivity on the building surfaces, and if the total dose (or residual radioactivity) is greater than 10 percent of the respective limit, the removable fraction of the residual radioactivity will be 10 percent or less at the time of decommissioning.

- The LTP describes/evaluates parameter uncertainty, for site-specific analyses. It should be noted that the uncertainty of prime interest to the staff is uncertainty in the physical parameters.

For restricted release, the LTP is acceptable if it addresses the criteria that follow. In addition to the criteria identified below, "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4), provides additional guidance, acceptable to the NRC staff, on how to demonstrate compliance with license termination restricted release criteria. Note that sites requesting consideration for restricted release will be included in the NRC's Site Decommissioning Management Plan.

- The licensee demonstrates that further reductions in residual radioactivity necessary to release the site for unrestricted use (1) would result in net public or environmental harm or (2) were not being made because the residual levels are ALARA. If the licensee has concluded that further reductions in residual radioactivity levels are not required because they are ALARA, the staff should verify that the licensee or responsible party has accurately calculated the benefits of further remediation vs. costs. The staff's review should verify that the following information is included in the dose modeling/ALARA demonstration subsection of the restricted use section: (1) a summary of the dose to the average member of the critical group when radionuclide levels are at the DCGL with institutional controls in place, as well as the estimated doses if they are no longer in place and (2) a summary of the evaluation performed demonstrating that these doses are ALARA.

- The licensee describes in detail the methods and assumptions that will be used to demonstrate that the licensee will provide reasonable assurance that the dose from residual radioactivity, distinguishable from background radiation, will not exceed 25 mrem per year to a member of the critical group, over a 1000-year period, with the restrictions in place.

- The licensee has made provisions for legally enforceable institutional controls

that would limit the dose to the average member of the critical group to 25 mrem (0.25 mSv) per year. The description of institutional controls that the licensee has provided for the site should include (1) a description of the legally enforceable institutional control(s) and an explanation of how the institutional control is a legally enforceable mechanism; (2) a description of the restrictions on present and future landowners; (3) a description of the parties enforcing and their authority to enforce the institutional control(s); (4) a discussion of the durability of the institutional control(s); (5) a description of the corrective actions that will be undertaken in the event the institutional control(s) fail; and (6) a description of the records pertaining to the institutional controls, how they will be maintained, and the duration of the post-license termination maintenance period.

- The licensee has provided sufficient financial assurance to enable an independent third party to assume and carry out responsibilities for any necessary control and maintenance of the site. The following information should be included in the LTP discussion of financial assurance mechanism: (1) a description of the arrangement or contract with the party charged with carrying out the actions necessary to maintain control at the site; (2) a demonstration that the contract or arrangement will remain in effect for as long as feasible, and include provisions for renewing or replacing the contract; (3) a description of the manner in which independent oversight of the party charged with maintaining the site will be conducted and what entity will conduct the oversight; (4) a description of the authority granted to the third party to perform, or have performed, any necessary maintenance activities; (5) unless the party is a government entity, a demonstration that the third party is not the party holding the financial assurance mechanism; (6) a demonstration that all records pertaining to official actions and financial payments made by the third party are open to public inspection; (7) a description of the periodic site inspections that will be performed by the third party; and (8) a copy of the financial assurance mechanism.

- The licensee has submitted to the NRC a license termination plan that indicates the licensee's intent to release the site under restricted conditions and tells how advice from individuals and institutions in the community that may be affected by the decommissioning process has been sought and incorporated, as appropriate, following analysis of that advice.

- The licensee demonstrates that the residual radioactivity levels have been reduced so that, if the institutional controls were no longer in effect, the annual dose to the average member of the critical group would not exceed either 100 mrem (1 mSv) or, under certain conditions, 500 mrem (5 mSv). If the 500-mrem per year (5 mSv per year) value is used, the licensee must (1) demonstrate that achieving 100 mrem per year is prohibitively expensive, not technically achievable, or would result in net harm, (2) make provisions for durable institutional controls, and (3) provide sufficient financial assurance to allow an independent third party to recheck the controls at least every 5 years.

- If the annual dose to the average member of the critical group would not exceed 100 mrem (1 mSv) if the institutional controls were no longer in effect, the licensee chooses a private individual, organization, or State or local government as the party responsible for enforcing the institutional control.

- The licensee demonstrates that when the annual dose could exceed 100 mrem (1 mSv) but be less than 500 mrem (5 mSv), if the institutional controls were no longer in effect, a more durable institutional control will be used, that is, 10 CFR 20.1403(e). To meet the requirement in 10 CFR 20.1403(e), an institutional control

that involves government ownership of land would be generally acceptable or an institutional control on privately owned land with a State or local government as the party responsible for enforcing the restriction could also be acceptable, depending on the circumstances at the site.

- The licensee identifies the affected parties. According to 10 CFR 20.1403(d)(2), the licensee must provide for participation by representatives of a broad cross-section of the community who may be affected by the decommissioning. Affected parties may include any State agency, local agency, or Federal Government agency, other than the NRC, that has jurisdiction or responsibilities with respect to the site to be decommissioned; local community, civic, labor, or environmental organizations with an interest in the decommissioning, and whose members would be affected by the decommissioning; adjacent landowners whose property abuts the site or portions of the site to be released under restricted conditions; and any Indian tribe or other indigenous people who have relevant treaty or statutory rights that may be affected by the decommissioning of the site. The following information should be included in the LTP discussion of how advice was sought, obtained, evaluated, and as appropriate, incorporated for each of the issues identified above: (1) a description of how individuals and institutions that may be affected by the decommissioning were identified and informed of the opportunity to provide advice to the licensee or responsible party; (2) a description of the manner in which the licensee obtained advice from these individuals or institutions; (3) a description of how the licensee provided for participation by a broad cross-section of community interests in obtaining the advice; (4) a description of how the licensee provided for a comprehensive, collective discussion on the issues by the participants represented; (5) a copy of the publicly available summary of the results of discussions, including individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants; (6) a description of how this summary has been made available to the public; and (7) a description of how the licensee evaluated the advice, and the rationale for incorporating, or not incorporating, the advice from affected members of the community into the decommissioning.

- The licensee demonstrates that it presented a comprehensive, collective discussion on the issues with represented participants, and provided a publicly available summary of the results that contained a description of the viewpoints of the participants on the issues, and a description of the extent of the agreement or disagreement among the participants on the issues.

- The licensee describes the site's end use for any areas proposed for restricted release.

For certain difficult sites with unique decommissioning problems, 10 CFR 20.1404 includes a provision by which the NRC may terminate a license using alternate criteria (i.e., criteria greater than the dose criterion of 10 CFR 20.1402, 1403(b) and 1403(d)(1)(i)(A) for terminating a license provided the licensee meets the requirements of 10 CFR 20.1404). The NRC expects the use of alternate criteria to be confined to rare situations. This provision was included in 10 CFR 20.1404 because the NRC believed that it is preferable to codify provisions for these difficult sites in the rule rather than require licensees to seek an exemption outside the rule. Under 10 CFR 20.1404, the NRC may consider terminating a license under alternate criteria that are greater than 25 mrem per year (but less than 100 mrem per year), but the NRC limits the conditions under which a licensee could apply to the NRC for, or be granted use of, alternate criteria to unusual site-specific circumstances.

For license termination using alternate criteria, the LTP is acceptable if it addresses the criteria identified below. In addition to the criteria identified below, "Radiological Criteria for License Termination Standard Review Plan" (Ref. 4), provides additional guidance, acceptable to the NRC staff, on how to demonstrate compliance with the license termination using alternate criteria. Note that the NRC staff is required to consult with the Environmental Protection Agency (EPA), and to obtain Commission approval of the use of the alternate criteria consistent with 10 CFR 20.1404 and 1405. The supporting analysis contains an evaluation of public comments and EPA's comments.

- The licensee proposing to use alternate criteria would have to present a complete and comprehensive analysis of such possible sources of exposure.

- The licensee would employ, to the extent practical, restrictions on site use for minimizing exposure at the site, using the provisions for institutional controls and financial assurance in 10 CFR 20.1403.

- The licensee-supporting analysis would demonstrate that the residual radioactivity levels have been reduced so that it is unlikely that the annual dose from all man-made sources combined, other than medical, to the average member of the critical group would not exceed 100 mrem (1 mSv).

- The licensee would reduce doses to ALARA levels, on the basis of a comprehensive analysis of risks and benefits of all viable alternatives.

- The licensee would seek advice from affected parties regarding the use of alternate criteria at the site. In seeking this advice, the licensee would conduct the activities for seeking advice required by 10 CFR 20.1404(a)(4), including providing for participation by a broad cross-section of the community who may be affected by decommissioning, providing an opportunity for a comprehensive collective discussion of the issues related to the alternate criteria by the affected parties, and providing a publicly available summary of all such discussions. As part of this process, the licensee would submit a decommissioning plan or LTP indicating how advice from individuals and institutions in the community that may be affected by the decommissioning has been sought and addressed. The LTP should include (1) a description of how individuals and institutions that may be affected by the decommissioning were identified and informed of the opportunity to provide advice to the licensee or responsible party; (2) a description of the manner in which the licensee obtained advice from these individuals or institutions; (3) a description of how the licensee provided for participation by a broad cross-section of community interests in obtaining the advice; (4) a description of how the licensee provided for a comprehensive, collective discussion on the issues by the participants represented; (5) a copy of the publicly available summary of the results of discussions, including individual viewpoints of the participants on the issues and the extent of agreement and disagreement among the participants; (6) a description of how this summary has been made available to the public; and (7) a description of how the licensee evaluated advice from individuals and institutions that could be affected by the decommissioning and the manner in which the advice was addressed.

- The licensee proposing to use alternate criteria has submitted a complete and comprehensive analysis of such possible sources of exposure.

- The licensee describes the site's end use for any areas proposed for restricted release. The description should include (1) a description of how the institutional control is a legally enforceable mechanism; (2) a description of the restrictions on present and future landowners; (3) a description of the

parties enforcing and their authority to enforce the institutional control(s); (4) a discussion of the durability of the institutional control(s); (5) a description of the activities that the party with the authority to enforce the institutional controls will undertake to enforce the institutional control(s); (6) the manner in which the party with the authority to enforce the institutional control(s) will be replaced if that party is no longer willing or able to enforce the institutional control(s); (7) a description of the duration of the institutional control(s), the conditions that will end the institutional control(s), and the activities that will be undertaken to end the institutional control(s); (8) a description of the corrective actions that will be undertaken in the event the institutional control(s) fail; and (9) a description of the records pertaining to the institutional controls, how they will be maintained, and the duration of the post-license termination maintenance period.

## 7. Update of the Site-Specific Decommissioning Costs

The LTP must provide an estimate of the remaining decommissioning cost for unrestricted or restricted release of the site. The LTP should compare the estimated cost with the present funds set aside for decommissioning, and should note how financial assurance instruments for decommissioning required under 10 CFR 50.75 will be increased, if necessary. The financial assurance instrument required under 10 CFR 50.75 must be funded to the amount of the cost estimate. If there is a deficit in current funding, the LTP must indicate the means for ensuring adequate funds to complete decommissioning. The regulation applicable to this area is 10 CFR 50.82(a)(9)(ii)(F).

The licensee is reminded that decommissioning is defined in 10 CFR 50.2 as the safe removal of a facility or site from service and reduction of residual radioactivity to levels that permit release of the site and termination of the license. For example, removing uncontaminated material, such as soil or a wall, to gain access to contamination that must be removed would be a legitimate decommissioning cost. However, the NRC does not consider the costs of demolition of decontaminated structures, site restoration activities, or other activities not involved with removing the facility from service or reducing residual radioactivity as decommissioning costs. Rather, they are considered utility operating expenses and are not included in the amount of money required to be placed in the plant's decommissioning fund in accordance with 10 CFR 50.75. The costs of constructing, operating, maintaining, and decommissioning an onsite spent fuel storage facility or independent spent fuel storage installation (ISFSI) are specifically excluded from decommissioning costs. A licensee is required to separately notify the NRC of its program to manage and provide funding for the management of irradiated fuel.

This section of NUREG–1700 was revised to make it consistent with the forthcoming guidance for developing a detailed site-specific cost estimate required by 10 CFR 50.82(a)(8)(iii), and the licensee will only be required to update any changes to the 50.82(a)(8)(iii) site-specific cost estimate that occurred since it was submitted. For example, the LTP cost estimate would be updated to reflect completed decommissioning activities, inflation, and changes in disposal cost. If little decommissioning has been completed, and inflation and disposal costs had not changed, the cost estimate required by 50.82(a)(8)(iii) may be acceptable. The NRC is not requiring the licensee to submit any contractual documents/agreements that exist between the licensee and its decommissining contractor, and the cost estimate should not be impacted by the election of the licensee to decommission the facility, or contract to decommission the facility. The NRC is only requiring the licensee to submit an update to the site-specific cost estimate required by 50.82(a)(8)(iii).

**Acceptance Criteria**

The LTP decommissioning cost estimates are acceptable if they include an evaluation of the cost elements identified below. In addition, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors" (Ref. 8), explains in detail the methods for estimating decommissioning costs, as well as accepted financial assurance mechanisms.

**Cost Elements**

- cost assumptions used, including a contingency factor
- major decommissioning activities and tasks
- unit cost factors
- estimated costs of decontamination and removal of equipment and structures
- estimated costs of waste disposal, including applicable disposal site surcharges and transportation costs
- estimated final survey costs
- estimated total costs

The LTP focuses on detailed activity-by-activity cost estimates.

The LTP compares the available funds for the decommissioning with the calculated total cost from the licensee's detailed cost analysis.

The LTP cost estimates for decommissioning are based on credible engineering assumptions, and the assumptions are related to all major remaining decommissioning activities and tasks and consistent with the information identified in Sections 3 and 4 of this SRP.

The LTP cost estimate is acceptable if it includes the cost of the remediation action being evaluated, the cost of transportation and disposal of the waste generated by the action, and other costs that are appropriate for the specific case. The current version of NUREG–1307, "Report on Waste Burial Charges" (Ref. 9), provides guidance on estimating waste disposal costs.

## 8. Supplement to the Environmental Report

The licensee must submit a supplement to the environmental report describing any new information or significant environmental change associated with the site-specific termination activities. The regulations applicable to this area of review are 10 CFR 50.82(a)(9)(ii)(G) and 10 CFR 51.53.

**Acceptance Criteria**

The supplement to the environmental report describes proposed termination activities resulting in significant environmental changes not bounded by the site-specific decommissioning activities described in the PSDAR, the previously issued environmental assessment, or the environmental impact statement. The supplement to the environmental report will be acceptable if the discussed proposed impacts are bounded by the impacts in NUREG–0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities" (Ref. 10), the PSDAR, the previously issued environmental assessment, or the environmental impact statement.

The supplement to the environmental report describes the impacts associated with those site-specific termination activities, compares the impact with previously analyzed termination activities, and analyzes the environmental impact of the site-specific activity.

The supplement to the environmental report describes changes to the data since the issuance of the PSDAR and the updated "Environmental Report—Operating License Stage" related to the site location, climate, demography, socioeconomic data, land use, surface water, ground water, and biota.

Following the completion of the staff's review of the licensee's supplement to the environmental report, the staff will document their findings in either an Environmental Assessment or an Environmental Impact Statement, if warranted.

## C. Evaluation Findings

The licensee's termination plan demonstrates that the remainder of the decommissioning activities will be performed in accordance with the regulations, will not be harmful to the common defense and security or to the health and safety of the public, and will not have a significant deleterious effect on the quality of the environment.

The conclusions are as follows:

(1) The licensee has submitted the LTP as a supplement to the facility's FSAR on its equivalent according to 10 CFR 50.82(a)(9)(i).

(2) The licensee has met the objective of providing an adequate site characterization (radiological and nonradiological) as required by 10 CFR 50.82(a)(9)(ii)(A).

(3) The licensee has identified the remaining dismantlement activities that are necessary to complete the decommissioning of the facility/site, as required by 10 CFR 50.82(a)(9)(ii)(B).

(4) The licensee has adequately identified all site areas requiring remediation and has in place an organization to safely perform the remediations as required by 10 CFR 50.82(a)(9)(ii)(C). The licensee has met the requirements of 10 CFR Part 20 and the applicable disposal site license conditions for processing, transport, and disposal of low-level radioactive waste.

(5) The licensee has conformed to 10 CFR 50.82(a)(9)(ii)(D) in that the final radiation survey plan in the LTP provides assurance that residual radioactive contamination levels will meet 10 CFR Part 20, Subpart E.

(6) The licensee has met the requirements of 10 CFR 50.82(a)(9)(ii)(E), with respect to providing a description of the end use of the site, if restricted.

(7) The licensee has met the requirements of 10 CFR 50.82(a)(9)(ii)(F), with respect to providing an updated site-specific estimate of the remaining decommissioning costs, and plans for ensuring the availability of adequate funds for decommissioning.

(8) The licensee has conformed to 10 CFR 20.1402 in that the LTP demonstrates that the radiological criteria for unrestricted release will be met.

(9) The licensee has conformed to 10 CFR 20.1403(a) in that the LTP demonstrates that further reductions in residual radioactivity necessary to release the site for unrestricted use (a) would result in net public or environmental harm or (b) were not being made because the residual levels are ALARA.

(10) The licensee has conformed to 10 CFR 20.1403(b) in that the LTP demonstrates that the dose criteria for restricted release, with the institutional controls in place, will be met.

(11) The licensee has conformed to 10 CFR 20.1403(c) in that the LTP demonstrates that sufficient financial assurance is available if a third party had to assume and carry out any necessary maintenance at the site.

(12) The licensee has conformed to 10 CFR 20.1403(d) in that the LTP demonstrates that the requirements related to public involvement criteria for license termination for restricted release have been met.

(13) The licensee has conformed to 10 CFR 20.1403(e) in that the LTP demonstrates that the dose criteria for restricted release, when the institutional controls fail, will be met.

(14) The licensee has conformed to 10 CFR 20.1404(a) in that the LTP demonstrates that the dose criteria for license termination using alternate criteria will be met.

(15) The licensee has conformed to 10 CFR 20.1404(a)(4) in that the LTP demonstrates that the requirements related to public involvement criteria for license termination using alternate criteria have been met.

(16) The decommissioning alternative provides for completion of decommissioning within 60 years, as required by 10 CFR 50.82(a)(3). If the decommissioning alternative results in delay of completion of decommissioning for more than 60 years, the license has justified the delay in accordance with 10 CFR 50.82(a)(3).

(17) The licensee has met the requirements of Part 51 by providing acceptable updates to the "Environmental Report—Post-Operating License Stage."

## D. Implementation

This SRP will be used to provide information to licensees regarding the staff's plans for evaluating conformance of LTP submittals, including submittals in acceptable alternate formats, to Commission regulations.

The provisions of this SRP apply to submittals made after the date of issuance of this SRP.

## E. References


(1) U.S. Nuclear Regulatory Commission, "Decommissioning of Nuclear Power Reactors" (10 CFR Parts 2, 50, and 51), *Federal Register*, Vol. 61, pp. 39278–39304 (61 FR 39278), July 29, 1996.

(2) U.S. Nuclear Regulatory Commission, Draft Regulatory Guide DG–1067, "Decommissioning of Nuclear Power Reactors," June 1997.

(3) U.S. Nuclear Regulatory Commission, "Radiological Criteria for License Termination" (10 CFR Parts 20, 30, 40, 50, 51, 70, and 72), *Federal Register*, Vol. 62, pp. 39058–39092 (62 FR 39058), July 21, 1997.

(4) U.S. Nuclear Regulatory Commission, "Radiological Criteria for License Termination Standard Review Plan," Draft June 1999.

(5) U.S. Nuclear Regulatory Commission, Draft Regulatory Guide DG–1071, "Standard Format and Content Guide for Post-Shutdown Decommissioning Activities Report," December 1997.

(6) U.S. Nuclear Regulatory Commission, Regulatory Guide 1.179, "Standard Format and Content of License Termination Plans for Nuclear Power Reactors," January 1999.

(7) U.S. Nuclear Regulatory Commission, NUREG–1549, "Decision Methods for Dose Assessment To Comply With Radiological Criteria for License Termination—Draft Report for Comment."

(8) U.S. Nuclear Regulatory Commission, Regulatory Guide 1.159, "Assuring the Availability of Funds for Decommissioning Nuclear Reactors."

(9) U.S. Nuclear Regulatory Commission, NUREG–1307, Rev. 8, "Report on Waste Burial Charges," December 1998.

(10) U.S. Nuclear Regulatory Commission, NUREG–0586, "Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities," August 1988.

## F. Summary of Public Comments

NUREG–1700 was issued as a draft for comment (*Federal Register*, Vol. 61, January 20, 1999, 61 FR 3140) and the public comment period closed on June 15, 1999. Yankee Atomic Electric Company and Portland General Electric Company commented on draft NUREG–1700. A summary of their comments and the NRC's responses are given below.

**Comment From Yankee Atomic Electric Company (Yankee):** Most of the Yankee comments were aimed at clarifying the amount of information required to be included in the LTP Final Survey Plan.

**NRC Response:** NRC evaluated each of the Yankee comments and either clarified the information requested in the LTP Section 5, "Final Radiation Survey Plan," or reduced the amount of information requested, if appropriate.

**Comment From Portland General Electric Company (PGEC):** Most of the PGEC comments addressed the amount of information required to be included in the LTP Final Survey Plan.

**NRC Response:** NRC evaluated each of the PGEC comments on LTP Section 5, "Final Radiation Survey Plan," and reduced the amount of information requested, if appropriate. However, the NRC staff's position is that if the NRC needs the information to make a finding that the Final Survey Plan meets the requirements of 10 CFR 50.82(a)(9)(ii)(D), the information requested may have been clarified but was not reduced.

NRC FORM 335 (2-89) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

# BIBLIOGRAPHIC DATA SHEET

*(See instructions on the reverse)*

1. REPORT NUMBER (Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)

NUREG-1700

2. TITLE AND SUBTITLE

Standard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans

3. DATE REPORT PUBLISHED

| MONTH | YEAR |
|---|---|
| April | 2000 |

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

Clayton L. Pittiglio

6. TYPE OF REPORT

Final

7. PERIOD COVERED *(Inclusive Dates)*

8. PERFORMING ORGANIZATION - NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

Division Of Waste Management
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001

9. SPONSORING ORGANIZATION - NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

Same as 8 above.

10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

The standard review plan (SRP) guides NRC staff reviewers in performing safety reviews of license termination plans (LTPs). Although the SRP is intended to be used by the NRC staff in conducting reviews, it can be used by interested parties responsible for conducting their own licensing reviews or developing an LTP. The principal purpose of the SRP is to ensure the quality and uniformity of staff reviews and to present a well-defined base from which to evaluate the requirements. It is also the purpose of the SRP to make the information about regulatory matters widely available to improve the understanding of the staff's review process by interested members of the public and the nuclear industry. Each SRP presents the acceptance criteria of all of the areas of review for license termination. The SRP identifies the matters to be reviewed, the basis for the review, and the conclusions that are sought.

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

Decommissioning License Termination Plans

13. AVAILABILITY STATEMENT

unlimited

14. SECURITY CLASSIFICATION

*(This Page)*

unclassified

*(This Report)*

unclassified

15. NUMBER OF PAGES

16. PRICE

Printed on recycled paper

Federal Recycling Program

NUREG-1700
FINAL REPORT

STANDARD REVIEW PLAN FOR EVALUATING NUCLEAR POWER REACTOR LICENSE TERMINATION PLANS

APRIL 2000

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

1975 25 years 2000

FIRST CLASS MAIL
POSTAGE AND FEES PAID
USNRC
PERMIT NO. G-67