

LICENSE TERMINATION PROCESS FOR NUCLEAR POWER REACTORS

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INTRODUCTION

The license termination process for nuclear power reactors licensed under 10 CFR Part 50 (Part 50) differs from that for material and fuel cycle licensees licensed under 10 CFR 30, 40, 70, and 72. For materials and fuel cycle licensees, a detailed decommissioning plan (DP), approved by the U.S. Nuclear Regulatory Commission, is generally required prior to commencing decontamination and remediation activities. DPs are approved by license amendment. Because decontamination and remediation activities for power reactors are similar to activities performed during operation, power reactors can perform most decommissioning activities under the provisions of the existing license. Power reactors are required to submit a license termination plan (LTP) near the end of the decommissioning process. Among other information, the LTP provides the conditions that will be met for termination of the Part 50 license and release of the site. This paper discusses the license termination process with a focus on the requirements for an LTP and the process involved with its review and approval.

REGULATORY FRAMEWORK

On July 29, 1996, the Commission promulgated amendments to its regulations in 10 CFR Parts 2, 50, and 51, prescribing procedures 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. Under these revised regulations, 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. License termination requirements are contained in 10 CFR 50.82. Under this regulation, power reactor licensees must submit an application for termination of the Part 50 license. This application must be accompanied or preceded by an LTP to be submitted for NRC approval. The LTP must be a supplement to the Final Safety Analysis Report, or equivalent, and must be submitted at least two years prior to termination. The LTP must include;

- A site characterization;
- Identification of remaining dismantlement activities;
- Plans for site remediation;
- Detailed plans for the final radiation survey;
- A description of the end use of the site, if restricted;
- An updated site-specific estimate of remaining decommissioning costs; and
- A supplement to the environmental report describing any new information or significant environmental change associated with the licensee's proposed decommissioning activities.

The NRC is required to notice receipt of the LTP and make it available for public comment. The NRC must schedule a public meeting in the vicinity of the licensee's facility upon receipt of the LTP. Because the LTP is approved by an amendment, the licensing action is accompanied by an opportunity for a hearing.

The license is terminated if the NRC determines that: (1) the remaining dismantlement activities have been performed in accordance with the approved LTP; and (2) the final radiation survey demonstrates that the facility and site are suitable for release in accordance with the criteria in NRC's License Termination Rule.

On July 21, 1997, the Commission amended its regulations in 10 CFR Parts 20, 30, 40, 50, 51, 70, and 72, prescribing specific criteria for license termination. The radiological criteria are contained in 10 CFR Part 20, Subpart E (License Termination Rule) (LTR). Under the LTR, 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.

REGULATORY GUIDANCE

The NRC has developed three principal documents that provide guidance to licensees and NRC staff concerning the format, content, and evaluation criteria for preparing and reviewing LTPs. The agency has participated in the development of a fourth document providing guidance for radiological surveys. These guidance documents are:

- Regulatory Guide 1.179, AStandard Format & Content of License Termination Plans for Nuclear Power Reactors;@
- NUREG-1700, AStandard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans;@
- NUREG-1727, ANMSS Decommissioning Standard Review Plan;@and
- NUREG-1575, AMulti-Agency Radiation Survey and Site Investigation Manual@

These documents were developed to ensure the quality and uniformity of staff reviews and to present a well-defined base from which to evaluate compliance with the regulations. Although the SRPs are intended to be used by the staff in conducting reviews, they can be used by interested parties responsible for conducting their own licensing reviews or developing an LTP. It is also the purpose of the SRPs 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.

NUREG-1727 was developed with a focus on the more expansive requirements for DPs required for materials and fuel cycle facilities. To avoid duplication of information, NUREG-1700 references the applicable portions of NUREG-1727 for detailed guidance.

REVIEW PROCESS

The review process begins with an Acceptance review.@ The acceptance review is an administrative review to determine if the required information is addressed in the LTP. The adequacy of this information is assessed in the technical review. The licensee is informed of the results of the acceptance review in writing. If the LTP is not accepted, it is returned to the licensee with the deficiencies identified. If the LTP is accepted, a review team is formed and a detailed project plan and schedule are developed. A summary schedule is provided to the licensee. The results of the initial technical review are documented in a Request for Additional Information (RAI). The RAI may be developed and transmitted in phases based on the schedule for review of the individual sections of the LTP. After the issues documented in the RAI are reviewed and resolved, a revised LTP is normally submitted. The staff documents the results of its review in two forms: (1) a Safety Evaluation Report (SER); and (2) an Environmental Assessment. The SER documents the staff's findings related to compliance with the decommissioning requirements in 10 CFR 50.82 and the LTR. The EA documents the staff's findings relating to the impacts of the decommissioning activities on the quality of human environment. The EA is developed in compliance with the National Environmental Policy Act and NRC's implementing regulations in 10 CFR Part 51. If a finding of significant impact is reached, an Environmental Impact Statement (EIS) would be developed. The staff expects that sites

proposed for restricted release under the LTR would require an EIS. The staff approves the LTP by license amendment subject to such conditions and limitations it finds appropriate and necessary as documented in the SER and EA.

STATUS OF REVIEWS

Four LTPs have been submitted and accepted for review and are at various stages in the technical review. The plants involved are: Trojan; Saxton; Maine Yankee; and Connecticut Yankee. The staff hopes to complete its review of the Trojan LTP in January 2001. RAIs have been issued for Saxton. The first of two planned RAIs has been issued for Maine Yankee. The Maine Yankee Atomic Power Company has stated that it plans to submit a revised LTP in April 2001. Until that revision is submitted, the staff is continuing its review of the docketed LTP. The initial RAI is under development for Connecticut Yankee.

LESSONS LEARNED

As a result of the staff's review of both LTPs and DPs, the staff has identified several areas for improvement in both the review process and in the quality of the information submitted for review.

Review Process

The staff has identified several ways to improve the review process:

- Early and frequent consultations with the licensee are needed.
- Project plans & schedules need to be developed early in the process & communicated with the licensee.
- A more expansive review may be needed for the acceptance review.

The staff plans to conduct pre-submittal conferences with licensees to discuss the scope and depth of information needed. The staff plans to use the acceptance review checklist provided in Appendix A of NUREG-1727 to identify this information. The completed checklist will then be used by the licensee as a guide for developing the LTP/DP and by the staff for the acceptance review.

As discussed above, the staff is now developing detailed project plans and schedules after the LTP is accepted. This was not the case for the first two LTPs submitted.

Because of the extent of some deficiencies noted during the technical review, the staff is considering expanding the acceptance review to include a limited technical review. In this manner, the staff may be able to identify significant technical deficiencies earlier in the review process.

Quality of Information

The staff has noted several recurring deficiencies. These include:

- Operational environmental monitoring of groundwater has been inadequate for site characterization.
- Design of the final survey plan has not involved the application of appropriate data quality objectives.
- Derivation of cleanup levels have not included the assumptions and justification for parameters used.
- A clear relationship is often lacking between the planned decommissioning activities and the associated cost estimate.
- Old records are often inadequate or inaccurate. Reliance on these records has impacted the quality of site characterization.

Each of these recurring deficiencies was discussed at the NRC's Decommissioning Workshop held in November 2000 and will be discussed in more detail in a forthcoming generic communication to licensees

SUMMARY

The license termination process for power reactors is relatively new. The staff is implementing this new framework and its supporting guidance in the review of four LTPs. In the process of these reviews, the staff has identified several areas for improving the process as well as recurring deficiencies in licensee's submittals. The staff has implemented improvements and is communicating recurring deficiencies in a generic manner to improve the quality of future submittals.

REFERENCES

1. U.S. Code of Federal Regulations, Chapter I, Title 10, Energy
2. U.S. Nuclear Regulatory Commission, AStandard Format & Content of License Termination Plans for Nuclear Power Reactors,@Regulatory Guide 1.179.
3. U.S. Nuclear Regulatory Commission, AStandard Review Plan for Evaluating Nuclear Power Reactor License Termination Plans,@NUREG-1700, April 2000.
4. U.S. Nuclear Regulatory Commission, ANMSS Decommissioning Standard Review Plan,@ NUREG-1727, September 2000.
5. U.S. Nuclear Regulatory Commission, AMulti-Agency Radiation Survey and Site Investigation Manual,@ NUREG-1575, December 1997.