

OVERVIEW OF NRC'S EFFORTS TO DEVELOP GUIDANCE FOR DECOMMISSIONING

Dominick A. Orlando, Christine M. Daily and Stephen McGuire
U.S. Nuclear Regulatory Commission
(301) 415-6749

ABSTRACT

On July 21, 1997, the U.S. Nuclear Regulatory Commission (NRC) published the final rule on Radiological Criteria for License Termination (the License Termination Rule) as Subpart E to 10 CFR Part 20. NRC regulations require that materials licensees submit Decommissioning Plans to support the decommissioning of its facility if it is required by license condition, or if the procedures and activities necessary to carry out the decommissioning have not been approved by NRC and these procedures could increase the potential health and safety impacts to the workers or the public. NRC regulations also require that reactor licensees submit Post-shutdown Decommissioning Activities Reports and License Termination Plans to support the decommissioning of nuclear power facilities. The NRC staff is currently developing guidance, including a Standard Review Plan, (SRP) a final Regulatory Guide for implementing the License Termination Rule (RegGuide) and the DandD Screen software for use by NRC in reviewing and evaluating plans and information submitted by licensees to support the decommissioning of nuclear facilities. This paper provides an overview of the NRC staff's efforts to develop this guidance.

INTRODUCTION

U.S. Nuclear Regulatory Commission (NRC) regulations at 10 CFR Parts 30, 40, 70, and 72 require that a decommissioning plan be submitted by a licensee to support the decommissioning of its facility when it is required by license condition, or if the procedures and activities necessary to carry out the decommissioning have not been approved by NRC and these procedures could increase the potential health and safety impacts to the workers or the public. The objective of the decommissioning plan is to describe the activities and procedures that the licensee intends to undertake to remove residual radioactive material at the facility to levels that meet NRC criteria for release of the site and termination of the radioactive materials license. NRC regulations at 10 CFR Part 50 require that, prior to or within 2 years following permanent cessation of operations, licensees must provide NRC with a post-shutdown decommissioning activities report (PSDAR). The purpose of the PSDAR is to provide NRC and the public with a general overview of the proposed decommissioning activities. 10 CFR Part 50 also requires that nuclear power reactor licensees submit a License Termination Plan (LTP) at least 2 years before termination of the license. The purpose of the LTP is to describe the radiological condition of the site, provide a dose assessment for the site, identify the remaining decommissioning activities, and provide the final survey plan for the site. NRC regulations at 10 CFR Part 20, Subpart E describe the criteria for the release of sites for unrestricted and restricted use and is applicable to all NRC licensees.

The NRC staff is currently developing guidance, including a Standard Review Plan (SRP), a final Regulatory Guide for implementing the requirements of 10 CFR Subpart E (RegGuide) and the DandD Screen software for use by NRC in reviewing and evaluating plans and information submitted by licensees to support the decommissioning of nuclear facilities. This guidance will be used by NRC staff and all NRC licensees decommissioning their facilities to determine if the decommissioning can be accomplished safely and if site meets the NRC's requirements for license termination.

The SRP will enable NRC staff to evaluate information submitted by licensees in a timely, efficient and consistent manner, to determine if the decommissioning can be conducted such that the public health and safety is protected and the facility can be released in accordance with NRC's requirements. The SRP will provide NRC staff with a description of the contents of specific decommissioning plan and modules, as well as evaluation and acceptance criteria for use in reviewing decommissioning plans and other information submitted by licensees to demonstrate that their facility is suitable for release in accordance with NRC requirements. The SRP will also be used by the NRC staff to evaluate the information contained in the LTP

Draft Regulatory Guide DG-4006 "Demonstrating Compliance with the Radiological Criteria for License Termination" (1) was published for interim use and comment in August 1998. It addresses the release from regulatory control of buildings and soil, but does not pertain to the release of contaminated equipment. It also describes methodologies that may be used by licensees and others to comply with the License Termination Rule requirements in 10 CFR Part 20, Subpart E.

The DandD Screen software provides a user-friendly analytical tool to address the technical dose criteria contained in NRC's radiological criteria for license termination at 10 CFR Part 20 Subpart E. Specifically, DandD embodies the NRC's screening methodology to allow licensees to convert residual radioactivity contamination levels at their site to annual dose, in a way consistent with both 10 CFR Part 20 and the corresponding implementation guidance described above.

Although the focus of this paper is the decommissioning of NRC materials licenses, the guidance developed by NRC staff in the SRP will be used to evaluate the applicable portions of decommissioning plans, PSDARs and LTPs. In addition, the guidance in DG-4006 and the DandD Screen software will be used by all NRC licensees to demonstrate that their facility is suitable for release and license termination. This guidance will also be used by NRC staff to evaluate the information submitted by NRC licensees to support the decommissioning of their facilities.

BACKGROUND

On June 27, 1988, NRC amended its regulations at 10 CFR Parts 30, 40, 50, 70, and 72 to set forth the technical and financial criteria for decommissioning licensed nuclear facilities. Since

1988, NRC has further amended its regulations to establish additional record keeping requirements for decommissioning, to establish time frames and schedules for the decommissioning of licensed nuclear facilities, to clarify that financial assurance requirements must be in place during operations and updated when licensed operations cease, and to establish radiological criteria for license termination. The intent of the regulations is to ensure that the decommissioning of all facilities utilizing source, special nuclear, and byproduct material will be accomplished in a safe and timely manner and that licensees, or responsible parties, will provide adequate funds to cover all costs associated with decommissioning.

NRC regulations require that a decommissioning plan be submitted by a licensee to support the decommissioning of its facility when it is required by license condition, or if the procedures and activities necessary to carry out the decommissioning have not been approved by NRC and these procedures could increase the potential health and safety impacts to the workers or the public. The regulations also require that decommissioning plans contain a description of the planned decommissioning activities, a description of the methods used to ensure protection of workers and the environment against radiation hazards during decommissioning, the choice of the alternative for decommissioning, a description of the controls and limits on procedures and equipment to protect occupational and public health and safety, and a description of technical specifications and quality assurance provisions in place during decommissioning. The objective of the decommissioning plan is to describe the activities and procedures that the licensee intends to undertake to remove residual radioactive material at the facility to levels that meet NRC criteria for release of the site and termination of the radioactive materials license.

Recently, NRC staff has developed guidance for use by the staff and licensees in preparing decommissioning plans including:

- NUREG/BR-0241- NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees, March 1997 (2). This handbook was developed to facilitate the timely decommissioning of licensed nuclear facilities in a manner that was consistent throughout the NRC, as well as in accordance with all applicable regulatory requirements. It is intended to be used as a reference document to, and in conjunction with, NRC Inspection Manual Chapter (IMC) 2602 "Decommissioning Inspection Program for Fuel Cycle and Materials Licensees." The Handbook is used by NRC staff overseeing the decommissioning program at licensed fuel cycle and materials sites; formerly licensed sites for which the licenses were previously terminated; sites involving source, special nuclear or byproduct material subject to NRC regulation for which a license was never issued; and sites in the NRC's SDMP program, use the policies and procedures discussed in this handbook. It is not used by NRC staff overseeing the decommissioning program at nuclear reactor facilities subject to regulation under 10 CFR Part 50. Rather, NRC staff overseeing the decommissioning of nuclear reactor facilities use the procedures described in the Decommissioning Project Manager's Handbook. NRC staff implementing the decommissioning program at uranium recovery facilities use the guidance in IMC 2801 "11e.(2) Byproduct Material Disposal Site;

- NUREG-1575 - The Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM), December 1997 (3). MARSSIM is a consensus document developed collaboratively by the Department of Defense, the Department of Energy; the Environmental Protection Agency and the Nuclear Regulatory Commission, each of which have authority over radioactive materials. It provides detailed guidance for planning, implementing and evaluating environmental and facility radiological surveys conducted to demonstrate compliance with a dose or risk-based regulation. MARSSIM does not provide guidance for translating the applicable release criterion into derived concentration limits. MARSSIM addresses surveys for contamination in surface soil and on building surfaces. Other media, such as ground or surface water, subsurface soil and vicinity properties are not directly addressed in the MARSSIM;
- NUREG-1505 - A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys, June 1998 (4). NUREG-1505 describes a nonparametric statistical methodology for the design and analysis of final status decommissioning surveys in support of the License Termination Rule. The techniques described are expected to be applicable to a broad range of circumstances, but do not preclude the use of alternative methods as particular situations may warrant. Nonparametric statistical methods for testing compliance with decommissioning criteria are provided both for the case in which the radionuclides of concern occur in background and also for the case in which they do not occur in background. The tests described are the Sign test, the Wilcoxon Rank Sum test, and a Quantile test. These tests are performed in conjunction with an Elevated Measurement Comparison to provide confidence that the radiological criteria specified for license termination are met. The Data Quality Objectives process is used for the planning of final site surveys. This includes methods for determining the number of samples needed to obtain statistically valid comparisons with decommissioning criteria and the methods for conducting the statistical tests with the resulting sample data;
- NUREG-1507 - Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions, June 1998 (5). NUREG-1507 describes and quantitatively evaluates the effects of various factors on the detection sensitivity of commercially available portable field instruments being used to conduct radiological surveys in support of decommissioning. An important factor affecting the costs and quality of such radiological surveys is the minimum detectable concentration (MDC) of field survey instruments in relation to the residual contamination criteria. This report evaluates the MDC for various field survey instruments and provides guidance for: (a) selection and proper use of portable survey instruments; and (b) understanding the field conditions and the extent to which the capabilities of those instruments can be limited. The types of instruments commonly used in field radiological surveys that were evaluated include, in part, gas proportional, Geiger-Muller, zinc sulfide and sodium iodide detectors; and,

- **DRAFT NUREG-1549 - Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination** July 1998 (6)(published for interim use and comment). NUREG-1549 describes an overall framework for dose assessment and decision making at sites where licensees have decided to begin the decommissioning and license termination process. The framework is designed to assist the licensee, NRC and stakeholders in making decommissioning decisions. By doing so it allows the licensee to coordinate its planning efforts with the NRC's input, to conduct dose assessments and site characterization activities remediation and land-use restrictions, to integrate analyses' for ALARA requirements and to elicit other stakeholder input at crucial points in the decommissioning process. The framework also provides an approach for treating some of the uncertainty associated with contaminated sites.

CURRENT EFFORTS

On July 21, 1997, NRC published the final rule on Radiological Criteria for License Termination (the License Termination Rule) as Subpart E to 10 CFR Part 20 (7). Under Subpart E, licensees must demonstrate its site is suitable for release in accordance with the criteria in Subpart E. Subpart E establishes criteria for the release of sites for unrestricted use, if the residual radioactivity that is distinguishable from background results in a total effective dose equivalent to an average member of a critical group that does not exceed 0.25 millisievert (25 millirem) per year and the residual radioactivity has been reduced to levels that are as low as is reasonably achievable (ALARA). Subpart E also establishes criteria for license termination under restricted use conditions if specific conditions are met and in unusual situations NRC may release sites exceeding the 0.25 millisievert limit if certain specified criteria are met. NRC staff is currently developing additional guidance to assist licensees and NRC staff in evaluating decommissioning plans and other information submitted by licensees to support license termination.

On July 8, 1998, the Commission approved the publication of the draft guidance for the License Termination Rule for a 2-year interim use period and instructed the NRC staff to maintain a dialogue with the public through the use of a Website and public workshops. The Commission also directed the NRC staff to develop a Standard Review Plan (SRP) that incorporates the risk-informed, iterative approach in NUREG-1549, including providing clear guidance on complying with the ALARA provisions in the final License Termination Rule. In addition, the Commission directed the NRC staff to review the potential conservatism in the DandD Screen software, test the DandD code on a complex decommissioning site, and use it as the pilot for developing the SRP. The NRC staff's efforts in developing this guidance are summarized below.

DG-4006

In August 1998, NRC published Draft Regulatory Guide DG-4006, "Demonstrating Compliance with the Radiological Criteria for License Termination," for interim use and comment. This document supercedes a working draft of the RegGuide, which was published in August 1994 as NUREG-1500. DG-4006 addresses the release from regulatory control of buildings and soil but does not pertain to the release of contaminated equipment.

It describes methodologies that may be used by licensees and others to comply with the License Termination Rule. These regulatory positions are:

- Dose Modeling - This regulatory position provides methods acceptable to NRC for demonstrating compliance with the dose criteria in the License Termination Rule. In particular, it addresses dose modeling methods to relate concentrations of residual radioactivity to dose to the average member of the critical group in order to demonstrate the dose criterion in the License Termination Rule have been met. It references NUREG -1549, which provides an acceptable methodology for calculating doses.
- Methods for Conducting Final Status Surveys - This regulatory position provides guidance on methods acceptable to NRC for conducting final radiation surveys for buildings and soil prior to terminating the license. It references the MARSSIM, NUREG 1505, and NUREG 1507 as acceptable methods for conducting final status surveys.
- ALARA analysis - This regulatory position provides guidance on methods acceptable to NRC to demonstrate that residual radioactivity has been reduced to levels that are as low as is reasonably achievable (ALARA). It also provides staff positions on acceptable methods to demonstrate that further reductions in residual radioactivity are not technically achievable, could result in net public or environmental harm or are prohibitively expensive. These demonstrations are necessary should a licensee request termination of its license under restricted use conditions.
- License Termination under Restricted Conditions - This regulatory position provides guidance on methods acceptable to NRC for terminating a license under restricted conditions, including establishing adequate institutional controls, demonstrating adequate financial assurance, and seeking public input on the proposed restrictions

DG-4006 also discusses how these regulatory positions should be integrated during license termination activities.

The NRC has requested that interested stakeholders and others provide comments on DG-4006 by August 31, 1999. Comments may be submitted by letter or posted directly on the Website. NRC currently plans to publish the final guidance in August, 2000.

Standard Review Plan

The NRC staff is currently developing an SRP for use by NRC in reviewing and evaluating plans and information submitted by licensees to support the decommissioning of nuclear facilities. When completed the SRP will enable NRC staff to evaluate information submitted by licensees in a timely, efficient and consistent manner, to determine if the decommissioning can be conducted such that the public health and safety are protected and the facility can be released in accordance with NRC's requirements. The SRP will provide NRC staff with a description of the contents of specific decommissioning plan modules, as well as evaluation and acceptance criteria

for use in reviewing decommissioning plans and other information submitted by licensees to demonstrate that their facility is suitable for release in accordance with NRC requirements. To obtain input from the regulated community on issues that will need to be addressed in the SRP, the NRC staff intends to hold workshops on dose modeling, surveys, demonstrating ALARA, and restricted use/alternate criteria.

The SRP will provide NRC staff with a description of the format and contents of specific decommissioning plan modules, as well as an evaluation and acceptance criteria for use in reviewing decommissioning plans and, other information submitted by licensees to demonstrate that the facility is suitable for release in accordance with NRC requirements. The format of the SRP will follow the format described in NUREG-1200 "Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility"(8). The technical issues and topics addressed in the SRP will be addressed relative to several functional areas summarized above. These functional areas will be further divided into specific technical review areas. Each technical review area will consist of the following sections:

- Responsibility for Review - Identifies the organization(s) responsible for evaluating the subject or technical review area covered by the functional area;
- Areas for Review - Describes the information that will be reviewed by the organization responsible for the review;
- Review Procedures - Describes how the review will be performed including step wise procedures that the reviewer will follow to verify the acceptance criteria have been satisfied;
- Acceptance Criteria - Describes the purpose of the review, the applicable regulatory requirements and related guidance, and the technical bases for determining the acceptability of the licensee's proposed activity;
- Evaluation Findings - Describes the type of conclusion that is required for the technical review area;
- References - Lists the references that will be used in the review process.

The SRP will supersede Regulatory Guide 3.65, "Standard Format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70," (9) and Policy and Guidance Directive FC 91-2, "Standard Review Plan: Evaluating Decommissioning Plans for Licensees under Parts 30, 40, and 70"(10). It will also supersede the applicable portions of Inspection Manual Chapter 2605, "Decommissioning Procedures for Fuel Cycle and Materials Licensees," (11) and the NMSS Decommissioning Handbook. As appropriate, the staff will update IMC 2605 and the Decommissioning Handbook to reflect the procedures and criteria in the SRP. Current staff plans are to begin posting the draft SRP modules on the Website for review and comment by interested stakeholders in mid-1999 and to complete development of the SRP by July 2000.

DandD Screening Model

The DandD Screen software provides a user-friendly, generally automated interface to NRC's dose assessment and screening methodology for site assessment against the Radiological Criteria for License Termination Rule in 10 CFR Part 20 Subpart E. DandD Screen assists NRC licensees who have requested termination of their license and who, in some cases, must decontaminate lands and structures as part of the decommissioning process by allowing licensees to translate residual radioactive contamination levels at their site into total effective dose equivalent (TEDE) by analyzing and modeling the set of NRC-prescribed scenarios of future land-use. DandD contains models of the transport and exposure pathways associated with each of the scenarios, requiring only information on source concentration from the user. Using DandD, and within the context of the decision methodology described in draft NUREG-1549, the user may supply site-specific parameter values if available and defensible, may modify or eliminate pathways, and may propose alternative critical groups and/or scenarios.

Specifically, DandD Screen is the software implementation of NRC's screening methodology transport and exposure models for assessing human health and safety against the dose requirements set forth in 10 CFR Part 20 Subpart E. For this discussion, screening refers to the release of a site where little or no site-specific information is known or used, other than level of contamination. To provide useful and defensible screening level calculations, the NRC has developed reasonably conservative scenarios, pathway models, and parameter values, and has implemented these in DandD Screen. "Reasonably conservative" implies that the calculated doses are much more likely to be overestimates of the actual dose rather than accurate estimates or underestimates, but at the same time are not necessarily worst case estimates. As a result, the scenarios and models implemented in DandD Screen are relatively simple. To perform these screening calculations, the DandD Screen software automates the scenarios, models, mathematical formulations, and assumptions documented in NUREG/CR-5512, Volume 1 (12) with a few corrections and enhancements. The generic modeling approach defines radiation exposure scenarios to address residual radioactive contamination inside buildings, in soils and in ground water. For buildings, two scenarios are presented. These scenarios relate both volume and surface contamination levels to estimates of the annual TEDE received during a year of exposure with the conditions defined in the scenarios.

For the simplest level of analysis (previously referred to as Level 1 screening), the user is required to provide a minimum amount of site-specific information. In general, only information about contaminant concentration is required for this level of analysis. This level of analysis is automated in DandD Screen, and therefore provides certain licensees a simple and cost-effective method for demonstrating compliance using a minimum amount of information. This level of analysis implements the generic scenarios and models from NUREG/CR-5512, Volume 1, (13) and uses deterministic values for all model parameters that have also been defined to be reasonably conservative. The default parameter values in DandD Screen Version 1.0 have been defined through a systematic process of assessing the variability of each parameter across the U.S. and then defining default values that produce generic dose estimates that are unlikely to be exceeded at any real site. In summary, the default models and parameter values are intended to

estimate the upper range of the dose that the average member of the critical group could receive at any site given the contaminant level at that site.

If a licensee has site-specific information for certain parameters, they may choose to replace the default parameter values with alternative values, and employ the default transport and exposure models. This level of analysis (previously referred to as Level 2 screening) is easily conducted with DandD Screen. Licensees are not required to conduct the "Level 1" screening calculations prior to proposing changes to parameter values if they have such information to do so.

The default parameter values for the NUREG/CR-5512 modeling (which are implemented in DandD Screen) are based on probability distributions representing the variability across the country. As a consequence, the licensee would likely need little supporting information to defend significant changes to the physical parameter values. For example, the probability distributions used in defining the default values for radionuclide sorption in soils for the NUREG/CR-5512 residential scenario models is based on the variety of all possible soil types and geochemical conditions. In order to provide a defensible screening process where a license could be terminated based only on residual contamination data, the parameter analysis produces default values for some of the sorption coefficients that are representative of the lower measured values. Therefore, many sites would be able to defend a significantly higher sorption coefficient and input this value into DandD Screen. This approach of moving away from the "reasonably conservative" values used in the NUREG/CR-5512 modeling could be used by all sites until the point that further reduction in simulated dose would require model changes. This would necessarily require the licensee to step away from using DandD Screen. At that point, new model parameter values would have to be developed and defended by the licensee. Model changes should lead to less conservative models and lower doses with each iteration, because the NUREG/CR-5512 models are designed to be inherently conservative.

DandD Screen is intended to be implemented within the structure of NRC's decommissioning decision framework documented in draft NUREG-1549. This process has been defined to allow licensees to define the most cost-effective decommissioning and license termination strategy by evaluating alternative actions at their site, including possible reductions in uncertainty that would reduce overall remediation costs. As such, because of nature of the DandD Screen models and default parameter values, the NRC does not expect licensees to define concentration clean-up levels based on preliminary DandD Screen dose calculations that fail to meet 10 CFR Part 20 dose criteria; rather, licensees are encouraged to evaluate the cost of added information and the value it adds in better defining remedial actions.

The results of the modeling in DandD Screen are used to produce reports, in NRC-defined and accepted text and graphics formats, that will allow the NRC to efficiently assess compliance with the 10 CFR Part 20 dose criteria and to determine if more detailed modeling should be required.

NRC staff will be assisted in the development of the guidance by several contractors over the two-year period. Sandia National Laboratory (SNL) will refine and complete the decision framework documented in NUREG-1549. NUREG-1549 provides guidance on conducting dose assessments to demonstrate compliance with Subpart E of 10 CFR Part 20. It is expected that the

SRP on dose modeling will build on NUREG-1549. Work will include testing the decision framework described in NUREG-1549 on real sites. Testing the framework will help to resolve key issues on implementing the framework. In addition, SNL will be developing a specific approach for defensibly moving away from using the generic land-use scenarios (i.e., building occupancy and resident farmer) identified in NUREG-1549. SNL will continue technical and user support for the DandD software, develop a version of DandD that integrates a Monte Carlo shell to support modification of parameter distributions based on site-specific information, publish NUREG/CR-5512 Volumes 2 (User's Manual), 3 (parameter analysis) and 4 (model comparison), and evaluate extensions to DandD to support dose calculations for subsurface contamination.

Argonne National Laboratory will develop parameter distributions, data ranges, and a single default parameter set for the RESRAD and RESRAD-Build computer codes. These two codes are currently widely used in dose assessment analyses. Work will provide information for developing an approach in the SRP for doing site-specific analyses. In addition, this information will be useful to staff in specifically reviewing licensees' dose assessment analyses involving these codes.

Pacific Northwest Laboratory will provide the technical bases, including generic databases and sources of information, and uncertainty assessment methodology for evaluating the parameters and assumptions in the ground-water pathway component of the dose models to be used in site-specific modeling assessments.

The NRC staff has several efforts underway to obtain input from interested stakeholders on the issues that will need to be addressed in the SRP, and final Regulatory Guide. NRC staff is holding monthly conference calls with interested stakeholders to identify these issues, has scheduled a series of workshops to discuss the issues and has established a Website to allow stakeholders to provide NRC with input on the issues. The staff is holding workshops on dose modeling, surveys, demonstrating ALARA, and restricted use/alternate criteria with stakeholders to discuss the issues in detail prior to the staff developing resolutions to the issues. NRC staff has scheduled six workshops between December 1998 and October 1999. All of the workshops will be held at NRC Headquarters at 11545 Rockville Pike, Rockville, Maryland. Workshops will be held on December 1-2, 1998; January 21-22, 1999; March 18-19, 1999; June 16-17, 1999; August 18-19, 1999, and October 20-21, 1999. Agendas for the final workshops will depend on the issues that emerge as industry, NRC, and other stakeholders review and gain experience using the draft guidance.

The staff has also established a Website and requests that interested individuals communicate their concerns by posting the concerns on the Website. Issues of concern that emerge from industry and stakeholder review and use of the guidance will be posted and discussed on the Website. The address for the Website is http://techconf.llnl.gov/cgi-bin/topics?rad_cri. The site contains seven major functional areas, of which four, dose modeling, final surveys, ALARA and restricted use/alternate criteria, have been created for discussion on the major topics in the SRP and Draft Reg Guide. Comments, questions and case specific experiences should be posted in these areas by stakeholders. The issues raised in these discussion areas will be considered for

topics at workshops. The Website also contains an area where NRC will post draft agendas for the meetings and workshops for review and comment. The Website will also contain a Question and Answer area where NRC will post the resolutions to issues raised during the workshops and meetings. Finally, NRC will post the draft SRP modules on the Website and request interested stakeholders to provide their comments.

Finally, the staff will provide interested stakeholders with the opportunity to review and comment on the SRP by posting the draft SRP modules on the Website at periodic intervals during the project.

In May 1998, NMSS established the Decommissioning Management Board (the Board) to provide coordinated management oversight of the development and implementation of policies and guidance for the decommissioning program. The staff frequently briefs the Board on the status of the development of the SRP. During these briefings, the staff provides the Board with the opportunity to review and provide direction on the issues that need to be addressed in the SRP, as well as the staff's proposed resolution to the issues. In addition, the staff discusses the management of the project and provides the Board with the opportunity to adjust the project to enhance its effectiveness and efficiency.

CONCLUSION

The NRC staff is currently developing guidance, including a Standard Review Plan, a final Regulatory Guide for implementing the License Termination Rule and the DandD Screen Model for use by NRC in reviewing and evaluating plans and information submitted by licensees to support the decommissioning of nuclear facilities. To obtain input from the regulated community on issues that will need to be addressed in the guidance, the NRC staff intends to hold workshops on dose modeling, surveys, demonstrating ALARA, and restricted use/alternate criteria. NRC staff currently expects to complete the development of this guidance in mid-2000. Although the focus of this paper has been the decommissioning of NRC materials licenses, the guidance developed by NRC staff in the SRP will be used to evaluate the applicable portions of decommissioning plans, PSDARs and LTPs. In addition, the guidance in DG-4006 and the DandD Screen software will be used by all NRC licensees to demonstrate that their facility is suitable for release and license termination. This guidance will also be used by NRC staff to evaluate the information submitted by NRC licensees to support the decommissioning of their facilities.

References

- (1) USNRC, "Demonstrating Compliance with Radiological Criteria for License Termination," Draft Regulatory Guide DG-4006, U.S. Nuclear Regulatory Commission, Washington D.C. August 1998
- (2) Orlando, D.A., et al, " NMSS Handbook for Decommissioning Fuel Cycle and Materials Licensees," NUREG/BR-0241, U.S. Nuclear Regulatory Commission, Washington, DC, March 1997.

- (3) USNRC, "The Multi-Agency Radiation Survey and Site Investigation Manual," NUREG-1575, U.S. Nuclear Regulatory Commission, Washington, DC December 1997.
- (4) Gogolak, C.V., et al, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys," NUREG-1505, U.S. Nuclear Regulatory Commission, Washington, DC June 1998.
- (5) Abelquist, E.W., "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions," NUREG-1507, U.S. Nuclear Regulatory Commission, Washington, DC June 1998.
- (6) USNRC, "Decision Methods for Dose Assessment to Comply with Radiological Criteria for License Termination," NUREG-1549, U.S. Nuclear Regulatory Commission, Washington, DC July 1998
- (7) USNRC, 10 CFR 20 ,et al., "Radiological Criteria for License Termination; Final Rule, Federal Register, Vol.62, No. 139, Monday July 21, 1997, pp 39058-39095.
- (8) USNRC "Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility" NUREG-1200, Rev. 2, U.S. Nuclear Regulatory Commission, Washington, DC January 1991
- (9) USNRC Regulatory Guide 3.65 "Standard Format and Content of Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70," U.S. Nuclear Regulatory Commission, Washington, DC, August 1989
- (10) USNRC Policy and Guidance Directive FC-91-2 "Standard Review Plan: Evaluating Decommissioning Plans for Licensees under 10 CFR Parts 30, 40, and 70," U.S. Nuclear Regulatory Commission, Washington, DC, January 1991
- (11) USNRC Inspection Manual Chapter 2605, "Decommissioning Procedures for Fuel Cycle and Materials Licensees"
- (12) Kennedy, W.E. and D.L. Streng, "Residual Radioactive Contamination from Decommissioning," NUREG/CR-5512, Volume 1, U.S. Nuclear Regulatory Commission, Washington, DC, October 1992