SECY-98-051

March 16, 1998

FOR: The Commissioners

FROM: L. Joseph Callan, Executive Director for Operations /s/

SUBJECT: GUIDANCE IN SUPPORT OF FINAL RULE ON RADIOLOGICAL CRITERIA FOR LICENSE TERMINATION

PURPOSE:

To provide the Commission, for its review and approval, the guidance documents that the staff plans to issue in support of the final rule addressing radiological criteria for license termination that was published on July 21, 1997.

BACKGROUND:

On May 21, 1997, the Commission approved a final rule package on radiological criteria for license termination, and directed the staff to provide it with regulatory guidance documents for review and approval no later than February 21, 1998 (subsequently, the staff requested that this date be changed to March 16, 1998 (SECY-98-025)).

The new Subpart E to 10CFR20 that was approved on May 21, 1997, specifies an all pathways dose criterion for unrestricted use of 25 mrem per year that is distinguishable from background. The projected dose is to be the total effective dose equivalent to an average member of the critical group. Part 20 defines the critical group to be "the group of individuals reasonably expected to receive the greatest exposure to residual radioactivity for any applicable set of circumstances." In addition, licensees must assure that the residual radioactivity has been reduced to levels that are as low as is reasonably achievable (ALARA).

Subpart E also indicates that sites can be considered acceptable for license termination under restricted conditions when the licensee can demonstrate that further reductions would result in net public or environmental harm or would not be ALARA. These licensees would also need to demonstrate that there would be provisions for legally enforceable institutional controls so that there is reasonable assurance that the dose will not exceed 25 mrem per year with the controls in place, and that sufficient financial assurance is in place for a third party to carry out necessary control and maintenance of the site. Any licensee proposing to decommission by restricting use of the site is also required to seek advice from affected members of the community on the licensee's proposed controls. In addition, the licensee must reduce residual radioactivity levels at a site so that, if the institutional controls were no longer in effect, the dose would not exceed 100 mrem per year or, under certain conditions, 500 mrem per year. For the higher value to be used, the licensee would have to demonstrate that further reductions are not technically achievable, are prohibitively expensive, or would result in net public or environmental harm. In addition, the licensee would have to make provision for durable controls and provide sufficient financial assurance to enable a government entity or independent third party to carry out rechecks of the site at intervals of less than every 5 years to assure that the controls remain in place.

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The last option for license termination under the rule is limited to unusual site-specific circumstances. In such cases, the NRC may consider use of alternate criteria greater than 25 mrem if a licensee provides assurance that the public would be unlikely to receive a dose from all man-made sources, other than medical, of more than 100 mrem per year by submitting an analysis of possible sources of exposure. In addition, the licensee would need to employ restrictions to the extent practicable, reduce doses to ALARA levels and seek public advice on the use of alternate criteria. This approach would require Commission approval.

DISCUSSION:

Regulatory guide (DG-4006), Demonstrating Compliance with the Radiological Criteria for License Termination, (see Enclosure 1) provides staff positions on each of the elements in Subpart E to Part 20. The regulatory guide contains four regulatory positions addressing the major aspects of the rule. Each position is discussed in detail below.

Regulatory Position 1 - provides guidance on the use of dose modeling in demonstrating compliance with the 25 mrem/yr dose criterion. The methodology described in NUREG-1549 (see Enclosure 2) that accompanies the regulatory guide provides the licensee with a decision-making process that ranges from a simple generic model to site-specific analyses involving adjustment of models and parameters to account for site-specific information. The staff chose this approach to provide licensees with greater flexibility in meeting the dose criterion. While the staff expects that many licensees with moderate to significant contamination will want to collect data on the specific characteristics of their site, those licensees with low levels of contamination may be able to save resources by using the generic approach.

Because the rule specifies that the 25 mrem per year dose is to the average member of the critical group, a screening model (DandD) was developed for 2 critical groups. The resident farmer group would be applicable when the site has soil contamination and will be released for unrestricted use. The building occupancy group would be applicable when commercial facilities on the site will be re-used. Licensees may propose different critical groups based on a site-specific analysis. The building occupancy scenario represents normal occupancy of a commercial building. Use of the residential farmer to represent the critical group for the residential scenario is highly conservative because it involves a scenario that has a resident farmer spending the majority of his time on the site, and obtaining a major portion of his diet and all drinking water from contaminated land. Although a conservative

scenario such as this is unlikely to occur at the majority of decommissioned sites, it has been included to provide a simple basis for estimating dose. In addition, the current generic model for the resident farmer includes a conservative groundwater model. This was done because it is very difficult to generically model ground water. The staff expects that use of a site-specific groundwater model would benefit most licensees with groundwater contamination.

The approach used by the staff, in developing the input parameters for DandD, was to specify ranges for the parameters to estimate variability across the US. Literature reviews and data base searches were used to collect data on the possible ranges. The range of parameters selected is expected to conservatively account for conditions at NRC licensed sites. Behavioral and metabolic parameters are intended to represent the expected variability within the screening group, i.e., workers in light industry for building occupancy and resident farmers for the residential scenario. Parameters were evaluated to eliminate physically impossible situations. The staff recognizes that the use of a generic model may not be appropriate for all licensees, and has provided guidance to licensees on the use of other models that may be more appropriate for their particular site. This includes codes developed by other Federal agencies such as EPA and DOE.

Currently, DandD is being revised to incorporate updated parameters. During the upcoming year the staff intends to include additional features that will make the code less conservative, such as, through the incorporation of updated dose conversion factors based on the current lung models used in ICRP68 entitled, "Dose Coefficients for Intakes of Radionuclides by Workers" (1995).

Regulatory Position 2 - provides guidance on conducting the final status survey. This section of the regulatory guide endorses the use of the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM)(Enclosure 3) and includes guidance for some specific areas not included in MARSSIM. MARSSIM was developed by the staffs of the NRC, DOE, EPA, and DOD, and is based a non-parametric statistical approach to designing the final status survey. The primary advantage in using such an approach is that it better characterizes actual environmental situations where contamination may not fit a normal (or Gaussian) distribution. In general, licensees using the MARSSIM approach will be able to collect fewer samples than was recommended under previous guidance. Additional information on conducting final status surveys is contained in NUREG-1505, "A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys," (Enclosure 4) and NUREG-1507, "Minimum Detectable Concentrations with Typical Radiation Survey Instruments for Various Contaminants and Field Conditions" (Enclosure 5).

Regulatory Position 3 - provides guidance on demonstrating that residual radioactivity is ALARA. This section of the regulatory guide provides methods for determining the costs and benefits of decommissioning actions. It also provides guidance on demonstrating compliance with other aspects of the final rule, such as what is meant by the terms "prohibitively expensive," "net public or environmental harm," and "not technically achievable." Comments received from the January 1998 workshop were addressed in the guide.

Regulatory Position 4 - provides guidance on releasing a site under restricted use provisions and on the use of alternate criteria. Included in this section is guidance on convening Site Specific Advisory Boards, acceptable institutional controls, and types of financial assurance needed to maintain institutional controls. Comments received from the October 1997 workshop were addressed in the guide.

Comments received at the Public Workshops on February 18 and 19, 1998

Two public workshops on the survey and on the dose modeling sections of the guide were held on February 18 and 19, respectively. There were no substantial disagreements with the survey method presented on February 18, although four principle points were raised: (1) the survey method needs more than the proposed 1-year of use testing; (2) there is concern about how well the survey method would work when the nuclide concentration equating to 25 mrem is less than its natural background concentration; (3) the survey method needs to be expanded to include survey methods for piping and equipment; and (4) there needs to be more guidance on the standard content and format for the information that needs to be submitted. The staff believes that most of these issues can be resolved during the period for comment and use. NMSS will develop appropriate additional guidance; e.g., a Standard Review Plan, to implement the positions described in the Regulatory Guide. The resources for this effort are not currently budgeted, and will have to be addressed in the upcoming fiscal year 2000 budget exercise.

At the dose modeling workshop on February 19, a principal concern raised was the need for the guide to clearly indicate the relationship between the four regulatory positions. DOE also raised concerns regarding NRC's recognition of RESRAD in the guide. The guide has been revised to address the first concern and clarify the staff's position on the use of other codes, including RESRAD.

Implementation:

The staff is proposing to issue the regulatory guide for use and comment, as discussed in SECY-98-025. In response to comments raised during the public meeting the staff is proposing to extend the comment period for the guide to 2 years. Licensees will be allowed to use the guide as if it were a final guide during the comment period. At the end of the 2 year comment period the staff will make any necessary revisions to the guidance and issue it in final form. In addition, several of the accompanying NUREGs (NUREG-1549 addressing dose methodology and NUREG-1505 addressing the statistical methodology for final status surveys) would also be issued for use and comment.

An interim version of the screening model will be released in April 1998 for use during the comment period for the regulatory guidance. The staff will continue to maintain a dialogue with the public through the use of the interactive website and workshops with the public. During this time, the screening model will also be tested and compared with other models in use, such as DOE's RESRAD, and EPA's PRESTO codes, to better determine its applicability for NRC licensees.

Coordination:

The Office of the General Counsel has reviewed this paper and the accompanying guidance documents and has no legal objection.

Recommendation:

That the Commission approve publication of the enclosed regulatory guide and supporting documents for comment and use for a period of 2 years.

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Enclosures: As stated

cc: SECY
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OCA
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NOTE: TO BE MADE PUBLICLY AVAILABLE WHEN THE FINAL SRM IS MADE AVAILABLE