



U.S. Council for Energy Awareness

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March 11, 1994

Secretary
U.S. Nuclear Regulatory Commission
Washington, DC 20555

OFFICE
DOCKET

Attn: Docketing and Services Branch

REFERENCE: Staff Draft Radiological Criteria for Decommissioning

Dear Sir:

These comments are being submitted by the U.S. Council for Energy Awareness on behalf of its Facility Operations Committee (FOC). These comments were generated as a result of participation in the series of public meetings held in the first part of 1993 and specifically in response to the U.S. Nuclear Regulatory Commission's "Staff Draft" on Proposed Radiological Criteria for Decommissioning.

The FOC membership consists of the owners and operators of fuel fabrication facilities, conversion facilities, uranium enrichment facilities, material processing facilities, as well as transporters and other related service and supply facilities. These members currently operate under licenses that are issued in accordance with 10CFR30, 40 and 70. Additionally, some members operate under Agreement State licenses. The members will be required to meet the decommissioning regulations at the time of license termination, and therefore, are directly impacted by the final outcome of this rule.

We have reviewed the comments submitted by the Fuel Cycle Facilities Forum and the Nuclear Management and Resources Council and consistent with the comments we are submitting, endorse the positions of these organizations.

The attachment explains in detail our comments. We would like to call attention to three major concerns that we have with the "Staff Draft": (1) the 15 mrem/y limit is not scientifically or technically based, nor is it justified from a risk perspective, and finally, it will not be practical to carry out economically, (2) given the requirements as proposed by the NRC, many fuel cycle licensees will be driven to complying with restricted release situation. The implications of this situation cannot be adequately assessed until those provisions are clarified and the guidance documents supporting them are released, and (3) the NRC's proposed mechanism for public/community involvement is unnecessary and inappropriate as a regulatory requirement to be imposed on the licensees.

If you have any questions concerning these comments, please call Felix Killar, or me directly.

Sincerely,

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SUMMARY OF NRC DRAFT RADIOLOGICAL CRITERIA
FOR DECOMMISSIONING WITH FOC EVALUATION AND RECOMMENDATIONS

1. Need for and Scope of Rule:

The NRC is proceeding with a rule-making which will establish radiological criteria for decommissioning. NRC's schedule calls for issuance of a final rule by May 1995.

FOC Response: We support NRC promulgating a rule to address radiological criteria for decommissioning. We believe, however, that it is absolutely necessary for the public and the industry to get to review all of the proposed guidance documents in conjunction with reviewing the proposed rule. Therefore, when issuing the proposed rule for comments, NRC should also issue the proposed guidance documents. In this regard, the May 1995 schedule may be ambitious. The proposed rule should also reflect changes consistent with our comments as follows.

2. Basis for Radiological Criteria:

"The Commission believes the dose limits and ALARA requirements of the proposed radiological criteria for decommissioning provide a reasonable basis for protection of public health and safety and the environment. However, the Commission has also determined that decommissioning activities should not be allowed the entire dose limit of 100 mrem/y for members of the public. The Commission has selected a value which is a relatively small fraction of the limit, consistent with other decisions of both the EPA and NRC for unrestricted access to areas.

The Commission believes that the goal for decommissioning should be the return of the facility to levels approximating background. However, the Commission recognizes that demonstrating that radioisotope levels at a site are indistinguishable from background will be a complex task involving sophisticated sampling, measuring, and statistical analysis techniques. The Commission also recognizes that the difficulty of the task can vary substantially depending on a number of factors including the radionuclide in question, the background level for that and other radionuclides at the site, and the temporal and spatial variations in background radiation at the site. Therefore, the Commission is proposing that the cumulative TEDE to the average member of the critical group from all radionuclides that could contribute to residual radioactivity and are distinguishable from background does not exceed 3 mrem (0.03 mSv) per year. One of the reasons three millirem per year was selected is because variations of this magnitude are barely distinguishable from the dose from background radiation. Three mrem/y is well within the variability of natural background radiation across the U.S. and also within those variations experienced seasonally at particular sites."

FOC Response: We agree with the NRC that the public exposure should be as low as reasonably achievable below 100 mrem/y. We do not agree that 3 mrem/y is distinguishable from background. Naturally occurring uranium averages about 1.0 pCi/gm in soil. This provides an exposure of approximately 6 mrem/y. Therefore, if 3 mrem/y over background is the target, variations in soil would be limited to +0.5 pCi/gm, naturally occurring uranium in soil can vary more than 3.0 pCi/gm within a few feet on an undisturbed site. Note: 3.0 pCi/gm would result in a dose greater than 15 mrem/y which is the upper limit that the NRC is proposing. Therefore, we believe the 3 mrem/y is not achievable with reasonable economics and is certainly not necessary from the standpoint of protecting public health and safety. Clearly, the risk does not justify the proposed limit. For example, using the results from the study of the

Japanese radiation survivors, the risk is just over 50% for one additional cancer death per 3,500 person rem. The study showed no radiation/concern relationship for individuals below 20 to 40 rem. Applying this 3,500 person rem to a decommissioned site, and assuming a lifetime of 70 years, (we realize the NRC/EPA is using 35 years but a safety factor of two is providing additional conservatism), the population would have to be exposed annually to 50 person rems. Using the NRC's proposed 15 mrem/y limit (0.015 rem/y), the site would have to handle over 3,000 people. If you assume 3000 people living on the site, it would have to be a major metropolitan area in which there are no buildings, paved roads, sidewalks, and they eat all of their food and drink all of their water from the site. This is not a reasonable assumption. Note: even at a 100 mrem/y limit, the site would have to support a population of 500 people. In this regard, an individual living on the site, at 100 mrem/y limit would receive a lifetime dose of 7.0 rem, which is well below the dose where any radiation effects have ever been found. We recommend the limit be 100 mrem/y with ALARA applied to achieve levels below the limit. Scientific data clearly supports such a limit, complemented by ALARA practices.

3. Individual vs Collective Doses:

"The Commission concludes that limiting individual dose to the levels specified in the criteria will assure that collective doses will be small and that the public health will be adequately protected. This is consistent with past Commission practice in establishing radiological criteria."

FOC Response: We support the NRC's conclusion that limiting the individual dose protects the public's health. We do not agree with the dose levels being proposed by the NRC.

4. Statement of Radiological Criteria:

"The Commission agrees that the goal of decommissioning should be to reduce residual radioactivity at a site to levels that are indistinguishable from background. There, the proposed rule would establish the following goal for decommissioning: (1) reduce the concentration of individual radionuclides which could contribute to residual radioactivity at the site to a level which is indistinguishable from background, (2) release the site for unrestricted use, and (3) terminate the license. For purposes of determining when further ALARA efforts need not be considered, the Commission would consider that this objective had been met if the cumulative TEDE to the average member of the critical group from all radionuclides that could contribute to residual radioactivity and are distinguishable from background does not exceed 3 mrem (0.03 mSv) per year.

The proposed rule would also establish a dose limit for release of the site of 15 mrem/y TEDE for residual radioactivity distinguishable from background and require that the licensee reduce this residual radioactivity to as close to the goal of indistinguishable from background as reasonably achievable. Sites meeting this criterion, including all those sites that also achieve the decommissioning goal, would be considered acceptable for release for unrestricted use and termination of the license."

FOC Response: We do not support the 15 mrem/y limit. It is not supportable from a risk level as discussed below, and it is not supportable at a practical level as discussed above. Taking measurements of uranium in soil in the 1-3 pCi/gm range falls in the area of uncertainty of the measurement by conventional techniques. In order to perform measurements of uranium at these levels require more sophisticated measurement techniques. These are much more costly. For practical considerations, the risk is not there to justify the costs, taking into consideration the net benefit. If the NRC

continues with this standard the result will be most, if not all, fuel cycle facilities becoming SDMP sites, or requiring exemptions to the essentially unnecessary and impractical dose limitation goals.

5. Consistency and Compatibility:

"The NRC is hopeful that the proposed criteria developed through the enhanced participatory rule-making process will be acceptable to all regulatory agencies and will be consistent and comparable with the requirements of other regulatory agencies."

FOC Response: The industry does not believe the NRC criteria is necessarily consistent with other regulatory agencies, particularly the EPA. The NRC approach appears to attempt to combine concepts (e.g. goals, limits, ALARA) that NRC and EPA use, but do so at levels and in a way which is inappropriate and confusing. Furthermore, until the guidance documents associated with implementing the rule are available, it is not possible to determine how consistent or comparable the requirements really are.

6. Finality:

"The Commission believes that actions taken under the criteria in this rule need not be revisited unless, based on new information, there is reason to believe that residual radioactivity remaining at the site could result in significant public or environmental harm."

FOC Response: The industry agrees with the NRC that it should be an extremely rare situation when actions taken under this rule would have to be revisited. We agree that such a situation would exist if new information indicated that a real, not perceived and not as NRC says "reason to believe" hazard to public health and safety were found to exist. Under such circumstances, a new assessment, including a cost-benefit analysis should be performed to determine whether any additional site cleanup was warranted.

7. Community Involvement:

"The Commission believes it is important for the public to not only be fully informed of the decommissioning actions at a particular site but also to be able to effectively participate in site decommissioning decisions. The proposed rule provides specific mechanisms for public participation in the decommissioning process, where such participation is important to ensuring that the public is adequately informed about proposed decommissioning activities or that the public and environment is adequately protected in conjunction with reliance on institutional controls to restrict site access after license termination."

FOC Response: The industry fully supports the concept of public/community involvement. The method, however, the NRC has proposed is unacceptable. The industry believes that there are already ample and formal mechanisms for public/community involvement in the development and review of a decommissioning plan and its ultimate approval by the NRC. The licensee should not be required by the NRC to be placed in a position of dealing with matters for which they have no legal responsibility and over which they have no legal controls. Furthermore, while community involvement is both desirable and fully supported by industry, it is not in the context of this rule an issue of public health and safety warranting a regulatory requirement by the NRC. Accordingly, the provisions relating to an SSAB should be deleted from the criteria. If the NRC wants to retain an SSAB, the NRC should assume all responsibilities for its functioning and clearly define the authority and role it has in the NRC's decision making process.

8. Stability and Flexibility:

"The Commission agrees that there is a need for consistent and stable radiological criteria for the decommissioning of licensed nuclear facilities throughout the United States. Therefore, this rule-making would establish a single set of radiological criteria which would apply to the decommissioning of all sites. However, the Commission also recognizes the need for flexibility in applying these criteria because of constraints posed by site specific conditions (e.g. geology, hydrology, meteorology, and radiation

background levels) and to provide opportunity for meaningful participation by local communities in individual decommissioning actions. Therefore, the proposed rule provides for site-specific implementation of the generic criteria."

FOC Response: The industry supports the NRC's position that implementation of the rule requires flexibility to address site specific conditions. However, until the guidance documents are available for review, no judgment on the adequacy of how the NRC is providing the flexibility can be rendered.

9. ALARA Considerations:

"The Commission agrees that all significant public and environmental risks should be considered. The proposed rule would require that the licensee, when determining ALARA for a specific decommissioning, consider all significant radiological and non-radiological risks from residual radioactivity and from the decommissioning process itself (including transportation and disposal of radioactive wastes generated in the process)."

FOC Response: The industry supports the NRC's position, that ALARA practices be applied. Again, however, if the ALARA practices are supposed to be applied between a 15 mrem/y and 3 mrem/y range, the value of ALARA is almost completely negated.

10. Site Remediation:

"Prior to the effective date of the final rule, the NRC will provide guidance on acceptable methodologies for demonstrating compliance with the Commission's residual radioactivity criteria. However, the Commission does not believe that it would be appropriate to prescribe, *a priori*, the methods to be used. Licensees need to be able to take advantage of whatever safe methodologies may be available for achieving remediation which approaches or meets the goal for decommissioning."

FOC Response: The industry believes it is essential that the guidance documents be issued for comment at the same time the proposed rule is issued.

11. Demonstrating Compliance:

"Prior to the effective date of the final rule, NRC plans to issue specific guidance which includes conservative radiation levels, surface contamination limits, and radioactivity concentrations for use by licensees who elect not to apply models to demonstrate compliance. Guidance on measurements covering the above listed five subjects will also be provided. The NRC appreciates that guidance is essential where the licensee must demonstrate compliance with criteria which require reduction of residual radioactivity to near background levels. The NRC expects to make sufficient confirmatory measurements to assure compliance with the criteria."

FOC Response: The basic position of NRC is appropriate; however, we know that at 15 mrem/y level it is going to be extremely difficult and extremely costly to demonstrate compliance. As discussed under "2. Basis for Radiological Criteria," we would expect that due to background variation and statistical counting variations, confirmatory measurements will be difficult to achieve. This will put fuel cycle facility sites in the category of sites which can only be released for restricted use.

12. Sites Which Cannot be Released for Unrestricted Use.

"The proposed rule provides for both unrestricted release and restricted termination of the license under prescribed conditions. The requirement that the licensee convene a

Site Specific Advisory Board early in the development of proposed decommissioning plans should help assure substantive public participation in decisions concerning possible restricted termination of the license. As previously discussed, the Commission is aware of sites, such as sites with significant volumes of thorium contamination, that would require extensively remedial efforts to achieve the proposed requirements for restricted or unrestricted release. If such sites cannot be remediated to achieve at least the restricted release criteria, then the site license would remain in effect indefinitely until technology or resources become available to achieve compliance with the criteria. In the interim period, NRC would ensure appropriate control of the licensed site on a site-specific basis, including access restrictions, environmental monitoring, personnel monitoring, posting, mitigative actions, and other measures directed at ensuring the stability of the radioactive material and protection of the public health and the environment."

FOC Response: The industry supports the concept of restricted release, as most of the fuel cycle facilities are likely to end up in this group. We are concerned with the restrictions, monitoring, access, etc., requirements if the site does not achieve the restricted release criteria. If implementation takes the form of controls, restrictions, etc., as an operating site, there is no value to this concept. Additionally, we are concerned that this becomes a deferral of the resolution of decommissioning, and does not meet the objective of the rule. The proposed criteria need to be improved in a number of respects. First, the criteria need to make clear that no exemption will be needed if a licensee meets the specified requirements for restricted release. The Commission should retain the ability to grant exemptions if a licensee cannot meet these specified requirements. Second, the TEDE limit for a site released under institutional controls should be at least 100 mrem/y, for the same reasons as discussed above for a site released for unrestricted use. Third, the criteria should not require that a specific TEDE be satisfied if the institutional controls were no longer effective. No numerical requirement is imposed by NRC or EPA for other sites released under institutional controls. If such a limit is imposed arbitrarily, it should certainly be higher than 100 mrem/y and it should be specifically determined and approved for each site. Finally, the Commission has recognized that engineered disposal cells, such as those approved by NRC for uranium mill tailings or by EPA for landfills, may be the best solution for sites containing large quantities of soils with low levels of contamination. Radioactive materials confined in such cells should not be considered in determining TEDEs if institutional controls are not in effect. Otherwise, licensees will in effect be prohibited without reason from using this alternative and the best solution will not be implemented. NRC should clearly look to alternatives as mentioned above that have already been implemented effectively in similar circumstances under other NRC and EPA programs.

13. Waste Disposal:

"The Commission recognizes the decommissioning to radiation levels approaching background may produce large volumes of low-level waste which could affect the availability of regional disposable capacity. However, the proposed rule would require the licensee to consider significant radiation doses and risks resulting from transportation and disposal of radioactive wastes generated in the decommissioning process when determining ALARA for a specific decommissioning action. If disposal capacity were to become temporarily limited, on-site storage and containment of wastes may be necessary until a disposal site becomes available."

FOC Response: The NRC seems to be taking an inconsistent position. On one hand, the NRC implies that remaining on-site contamination would be acceptable while taking ALARA and non-radiological risks into consideration. On the other hand, the NRC states that temporary on-site containment is acceptable until an off-site contamination facility becomes available. The industry believes that on-site disposal should be acceptable within the provision of 10CFR20 and the site release criteria.

14. Minimizing Generation of Waste:

"The NRC agrees that licensed facilities should be encouraged in designing and operating nuclear facilities to minimize the generation of radioactive waste and facility contamination. The proposed rule would require applicants for licenses after the effective date of the rule to describe in the application how facility designs and procedures for operation will minimize contamination of the facility and the environment, facilitate eventual decommissioning, and minimize the generation of radioactive waste."

FOC Response: The industry supports the concept of waste minimization, however, we question whether this provision belongs in the rule. The industry is currently minimizing contamination to meet ALARA. We minimize the generation of radioactive waste in operations and decommissioning and consistent with ALARA considerations due to the high cost of disposal. Waste disposal costs drive an optimization of all of these factors as part of the decommissioning process. Arbitrary requirements by the NRC to reduce waste during decommissioning could result in the generation of more waste during operation. Again, we recommend that this provision be dropped from the proposed rule.

15. Radon:

"The Commission believes that it is not possible using current technology to measure or distinguish concentrations of radon which will produce radiation doses of a few mrem TEDE/y above background. This belief is based on (1) recognition of the ubiquitous nature of radon in the general environment, (2) large uncertainties in the models used to project concentrations in indoor air based on soil concentrations, and (3) limitations on existing measuring techniques in distinguishing between elevated radon concentrations and radon attributed to natural sources. Therefore, the Commission does not propose to establish a separate standard for radon. Instead exposure to radon at decommissioned sites would be controlled by requiring the licensee to reduce the residual concentrations of radon precursors like uranium, thorium, and radium to levels within the limit for unrestricted use and, using the ALARA principle, toward levels which are indistinguishable from background levels."

FOC Response: The NRC states that radon does not have to be taken into consideration in dose calculations provided the radon precursors are reduced to appropriate levels. This would be acceptable provided the NRC revises the 15 mrem/y to 100 mrem/y.

16. Environmental and Social Considerations:

"The NRC considered the possible need for radiation standards specifically designed to protect the environment. Based on this analysis, the Commission concludes that the radiological criteria in the proposed rule which are designed to protect public health should also provide adequate environmental protection.

However, the Commission recognizes there may be environmental or cultural issues associated with a particular decommissioning action which require special consideration. These issues can best be handled on a site-by-site basis as part of the decommissioning plan review under the National Environmental Policy Act (NEPA). Where necessary, opportunity for public comment and use of the Site Specific Advisory Board will provide a mechanism for local citizens and other affected parties to be directly involved in addressing these issues."

FOC Response: We support the NRC's position, however, as discussed above, we are concerned with the imposition of a Site Specific Advisory Board as a regulatory requirement on licensees.

17. Recycle:

"Although the proposed rule does not specifically address recycle, the Commission believes the radiological criteria in the proposed rule provide reasonable assurance that future inadvertent recycle of soils or structures following decommissioning of a site will not adversely affect public health. The analysis which supports the rule, although it does not specifically take recycle into account, is based on prudently conservative scenarios which tend to overestimate expected public doses."

FOC Response: The industry supports the position taken by the NRC, not to put this requirement into the rule.