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March 7, 1994

OFFICE OF SECRETARY
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Secretary of the Commission
US Nuclear Regulatory Commission
Attention: Docketing and Service Branch
Washington, DC 20555

Gentlemen:

**RE: Radiological Criteria for Decommissioning of NRC-Licensed Facilities:
Enhanced Participatory Rulemaking. Availability of the Staff's Draft of the
Rule.**

This letter is provided in response to the US Nuclear Regulatory Commission's (NRC's) solicitation of comments on the staff draft (dated January 26, 1994) for the rule for radiologic criteria for decommissioning NRC-licensed facilities.

The California Department of Health Services (DHS) is responsible for protecting the health of California citizens with regard to radioactivity in the environment. DHS regulates the use of radioactive material and radiation-generating equipment in California, under an agreement with the NRC, and is also responsible for California's programs related to low-level radioactive waste disposal, nuclear power plant emergency response, oversight of activities on Department of Energy facilities, and cleanup of radioactivity on closing military bases.

We appreciate the opportunity to comment on the draft proposal. We especially would like to commend the NRC for embarking on an "enhanced participatory rulemaking" for the important issue of decommissioning of NRC licensed facilities. Addressing issues of environmental cleanup of radioactive contamination is important in expediting site remediation and decommissioning activities. Until a consistent cleanup approach and a uniform target for residual radioactivity are established, little progress can be anticipated. Our comments are in several areas, as follows:

Appropriateness of the NRC proposal.

For the past few months, in considering this State's approach to establishing cleanup levels of radioactive contamination associated primarily with closing military bases, we have discussed the need to regulate radioactive material in the environment in a manner consistent with the regulation of chemical contaminants. If the goal of cleanup is to limit the public exposure to carcinogens in excess of their natural background levels, then the carcinogenic risk should be limited to the same risk level, whether the substance of concern is a chemical carcinogen or radioactive. That is, if chemical carcinogens are regulated to keep lifetime cancer risks below

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10^{-6} to 10^{-4} , it is reasonable to limit lifetime cancer risks from exposures to radioactivity to the same level (excluding background). If exposures cannot be differentiated from background because they result from naturally occurring radionuclides in their natural environmental concentrations, then cleanup would need to be only to background levels.

We have expressed our views to the NRC during the preliminary stages of this rulemaking, and we made the same suggestion to the US Environmental Protection Agency, in comments on its Advance Notice of Proposed Rulemaking—Radiation Site Cleanup Regulations.

By uniformly addressing the risks rather than using different approaches for materials causing those risks, we believe that the NRC, EPA and other regulators can adopt a consistent regulatory approach to environmental cleanup that can better prioritize where resources associated with environmental cleanup should be used. Sites that pose the greater health risks—whether they are the result of chemical, radiological, or combined exposures—should be of a higher priority than sites that pose health risks of lesser concern.

Hence, we are pleased that the NRC staff draft criteria for decommissioning use lifetime cancer risk levels as instrumental in determining the cleanup approach. An approach based on minimizing cancer risk makes sense, for the reasons given above. It also enables those who may be familiar with the cleanup of chemical contamination at sites to appreciate the cleanup of radioactive contamination, since it relies upon terminology and health endpoints of concern that are recognizable to those outside radiation disciplines.

Potential problems with the choice of limits of 3 mrem/yr and 15 mrem/yr.

We applaud the view of the Commission that the goal of decommissioning should be "to reduce the concentration of each radionuclide which could contribute to residual radioactivity at a site to a level which is indistinguishable from background." We believe it to be reasonable for the Commission to consider that the objective has been met if the cumulative total effective dose equivalent (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 per year, consistent with EPA's 10^{-4} lifetime risk level used for Superfund cleanup. Under the NRC draft proposal, such sites would be acceptable for release for unrestricted use and termination of the license.

In the proposal, NRC may want to identify its basis for equating a 10^{-4} risk with 3 mrem/yr. Recent publications indicate that 2 mrem/yr may be a more appropriate exposure level to correspond to the 10^{-4} risk target, though the difference may reflect assumptions or other references used by the NRC.

For example, calculations based upon the National Academy of Sciences/National Research Council's *Health Effects of Exposure to Low Levels of Ionizing Radiation*, BEIR V, 1990 (Table 4.4, Page 176) to be 520 and 600 excess cancer deaths per 100,000 for males and females, respectively, for a continuous exposure of 1 milligrays per year (100 millirads per year). From these values, an estimated lifetime risk of 6×10^{-5} per mrad/yr results. Hence, 1.6 mrad/yr would yield a lifetime cancer risk of 1×10^{-4} . With a quality factor of unity, the comparable dose equivalent would be 1.6 mrem/yr.

Further, the National Council on Radiological Protection and Measurements (NCRP), in *Limitation of Exposure to Ionizing Radiation*, NCRP Report No. 116, 1993 (Table 7.1) presents estimates of 5×10^{-2} excess fatal cancers per 100 rem and 1×10^{-2} excess non-fatal cancers per 100 rem, based on NCRP and International Council on Radiological Protection reports. These can be summed to equal 6×10^{-2} per 100 rem, or, with a linear assumption, 6×10^{-7} per mrem. From this, an annual exposure of 1 mrem each year for 70 yr would result in a lifetime risk of 4.2×10^{-5} excess cases of cancer, and an annual exposure of 2.4 mrem would result in a lifetime cancer risk of 1×10^{-4} .

The proposed rule would also establish a limit of 15 mrem per year 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. According to the proposed rule, meeting this criterion would also be considered acceptable for release for unrestricted use and termination of the license. The draft considers this level also to be consistent with EPA's 10^{-4} lifetime risk level for Superfund. However, the cancer risk from 15 mrem/yr is obviously greater than that from 3 mrem per year (NRC's proposed goal). Again, depending on the assumptions one uses in estimated exposures, 15 mrem per year could be considered to pose a 10^{-3} lifetime cancer risk, an order of magnitude greater than EPA's limit. We believe the NRC should more clearly discuss this in its proposal, since it does present an apparent inconsistency with EPA's Superfund approach. Also, it would be helpful to clarify whether 9×10^{-4} is "the upper level of lifetime risk used by EPA for Superfund." Rounding off would make this a " 10^{-3} " risk.

In California we have an initiative statute, "The Safe Drinking Water and Toxic Enforcement Act of 1986" (Health and Safety Code 25249.5, *et seq.*), that requires businesses to provide warnings to individuals who will be exposed to carcinogens when the risk exceeds 10^{-5} . (Failure to provide warnings when they are required may subject the business to citizen enforcement and potentially severe penalties, a portion of which is paid to the citizen enforcer.) As a result of this law, certain NRC-licensed facilities that expose people to radionuclides, which are subject to the Act's provisions, may be required to provide warnings. This would continue to be the case, even after the license is terminated, if exposure could be distinguished from background. (The 10^{-5} cancer risk level corresponds to an exposure of less than 1 mrem/yr.)

The NRC needs to be aware of the presence of California Health and Safety Code 25249.5, *et seq.*, since it could cause some confusion to licensees as well as members of the public. A site in California that is remediated to a level that meets the NRC criteria (able to be distinguished from background and less than 3 mrem/yr or 15 mrem/yr), but nonetheless is required to give public warnings about the cancer risk, will likely be perceived as not having been adequately remediated. This potential problem in public perception (admittedly a localized one for California) argues for cleanup of radioactive contamination to levels indistinguishable from background when the property is intended to be unrestricted, or at least for considerable interaction with the public to explain the health significance of exposures at the 3-mrem and 15-mrem annual limits.

The proposed limit of 15 mrem per year that would be considered acceptable for release for unrestricted use also may be confusing to the public. Only last year, NRC withdrew its "Below Regulatory Concern" statements, which identified 10 mrem per year as the exposure level below which no regulation was required. With the current proposal's 15 mrem/yr limit for unrestricted use (hence also "below regulatory concern"), might not the NRC be setting the stage for renewed

criticism? A single limit of 3 mrem/yr would avoid this potential criticism, and would be consistent with the regulatory limits such of EPA's Superfund.

Possible confusion among the SSAB.

The proposed rule establishes Site Specific Advisory Boards (SSABs) for decommissioning actions where the licensee proposes to request license termination with land use restrictions, for the purpose of obtaining advice from affected parties regarding the proposed decommissioning. Among the roles of the SSAB is to provide recommendations to the licensee on "whether there are ways to reduce residual radioactivity to the levels which would permit release for unrestricted use which are technically achievable, would not be prohibitively expensive, and would not result in net public or environmental harm."

The SSAB, we presume, would be convened in situations in which the exposure would be greater than 15 mrem/yr, and the recommendations would be related to restrictions to subsequent use of the property. Since the limit of background or 15 mrem/yr and the goal of background or 3 mrem/yr each can lead to unrestricted use, we wonder if the SSAB will not be confused about the difference between the two, and whether it will end up making recommendations to the licensee to reduce exposures to the goal of background or 3 mrem/yr, even though that is not the stated purpose of the SSAB.

A possible modification of the NRC proposal.

The NRC proposal appears to bring public involvement into the decommissioning process only when restrictions (*i.e.*, regulations or other limits on exposure) are to be placed on the property, yet would not involve the public when the subsequent use of the property is unrestricted (*i.e.*, without regulatory oversight). To some, this might seem the reverse of what would be more appropriate—that is, public interaction should be sought when there will be no regulatory oversight after decommissioning. Hence, the NRC might want to consider requiring that the SSAB should be convened whenever residual radioactive contamination is able to be differentiated from background.

In addition, the proposal of both a goal and a limit in this rule might lead to come confusion among those who seek to put it into practice. This would seem likely, since exposures to background, 3 mrem/yr, 15 mrem/yr and 100 mrem/yr are all levels that enter into the decommissioning process. (The 100-mrem annual is to be met if the restrictions imposed for the 15-mrem limit for license termination were to become no longer effective.)

One way through this potentially difficult situation might be for the NRC to establish several different exposure levels and corresponding regulatory or public oversight activities. For example, an exposure that cannot be differentiated from background could be the goal. A site meeting this goal would be acceptable for unrestricted release and license termination, and would not require the licensee to convene an SAAB. In California, meeting this goal would allow the licensee to avoid the need for subsequent public warnings under California Health and Safety Code 25249.5, *et seq.*, as mentioned above.

Where the exposure is greater than background, but at or below 3 mrem/yr, meeting this lower limit for unrestricted use would also be acceptable for unrestricted release and license termination, provided that the SAAB has been brought into the process and its recommendations have been appropriately addressed and responded to by the licensee.

March 7, 1994

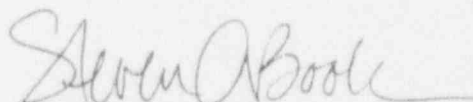
Where the exposure is greater than background, and above 3 mrem/yr but at or less than 15 mrem/yr, this would be acceptable for unrestricted release and license termination, provided that the SSAB has been brought into the process and its recommendations have been appropriately addressed and responded to by the licensee. This process would allow a forum for discussion of the activities that would be used to reduce residual radioactivity to as close to the goal or "lower limit" as is reasonably achievable. It could be referred to as an upper limit for unrestricted use.

Remediation of residual radioactivity to an exposure greater than 15 mrem/yr would be a limit with restrictions. The proposal will not allow exposures at the site to exceed 100 mrem/yr, even if the restrictions applied were no longer effective. The SAAB's involvement, as described in the proposal, would allow a discussion of meeting the 100-mrem annual limit as well, should the restrictions fail, which is appropriate.

The result of such a tiered approach would be that the SSAB would be involved in all license terminations and decommissioning activities associated with restricted use, as well as unrestricted use, except when the residual radioactivity is not able to be distinguished from background. This is reasonable, given that the process is oriented towards assuring public health protection on property that is free from radiologic controls and regulatory oversight.

Again, thank you for the opportunity to comment on the staff draft of the proposed rule for radiologic criteria associated with decommissioning NRC-licensed facilities. If you would like further information about these comments, please feel free to contact me at (916) 322-2183.

Sincerely,



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