NRC To Exempt Very Low-Level Radioactive Waste

The Nuclear Regulatory Commission (NRC) has approved a new policy statement that will guide the agency in determining which waste has low enough levels of radiation to be considered below regulatory concern (BRC). The agency will exempt this waste from the usual regulatory controls that call for disposal in one of the country's three licensed landfills, allowing the slightly radioactive waste to be disposed of in municipal dumps. The policy statement, announced by NRC Chairman Kenneth Carr on June 27th and effective July 3, could permit about 30% of radioactive waste to be exempted from regulatory control.

In the past, the Commission has exempted radioactive waste from regulatory control on a case-by-case basis without a uniform set of guidelines. Former exemptions include smoke detectors and some very low-level radioactive waste from hospitals and research institutions. The new policy will standardize the criteria for exemptions, giving the Commission a new tool in its decision making process. Using the criteria as a starting point, the Commission will still judge each case individually to determine if a given product should be exempted. In the future, exemptions may be granted for: the release of land and structures containing residual radioactivity for unrestricted public use; the distribution of consumer products containing small amounts of radioactive material; the disposal of low-level radioactive waste outside of licensed disposal sites; and the recycling of slightly radioactive equipment and materials.

During his address announcing the new policy, Chairman Carr stressed the NRC's commitment to safety. "The NRC will analyze and scrutinize each proposed exemption to ensure that any radiation dose will be extremely low. The safety of the public and the environment will remain properly protected."

The NRC has decided to use an individual dose criterion of 10 mrem/yr (0.1 mSv/yr) as the upper limit for single radioactive waste products to be considered for exemption. [The average individual radiation dose in the United States is 360 mrem/yr (3.6 mSv/yr), about 60 mrem/yr (0.6 mSv/yr) of which comes from man-made sources.] The 10 mrem/yr limit would apply to the decommissioning of radioactive sites and other cases of a stationary character, where there are relatively few people exposed. To allow for the cumulative effect of exposure to various exempted wastes, the Commission has decided to implement the policy with an interim individual dose criterion of 1 mrem/yr (0.01 mSv/yr) for radioactive materials with widespread distribution, such as consumer products and recycled material and equipment. If the Commission decides that a proposed exemption for a single practice would actually result in multiple exposures, the NRC will treat the proposal as a multiple practice and subject it to the 1 mrem/yr criterion. An example of this would be individual hospitals in a metropolitan area asking for single use, 10 mrem/yr criterion exemptions, when all of the hospitals send their waste to the same municipal landfill.

Robert M. Bernero, director, office of nuclear material safety and standards at the NRC, says that the interim individual dose criterion will be used for the forseeable future, that is, at least for several years. The Commission will then evaluate how the interim dose is working, including the reactions of scientists, medical staff, and the public to the dose limits. Mr. Bernero thinks that the NRC's 10 mrem/yr dose criterion for single use materials is too high because it has "too many vulnerabilities to multiple practice." However, he thinks the interim dose level of 1 mrem/yr is conservative and will adequately protect the public from the possibility of multiple exposures leading to radiation doses above 10 mrem/yr.

While the NRC states that there will not be any measurable adverse impact on the public's health and safety, other organizations are not convinced. Richard J. Guimond, director, office of radiation programs at the Environmental Protection Agency (EPA), says that it is difficult to interpret what the NRC's BRC policy means and, consequently, what the EPA's reaction to it is. He asks, what is a large or small number of people and how will the NRC define practice? (Practice refers to the method of waste disposal being considered for exemption. Mr. Bernero stated that the NRC will define practice broadly.) The EPA is considering proposing a BRC standard of 4 mrem/yr (0.4 mSv/yr). The EPA's primary concern is groundwater contamination: current EPA regulations stipulate that no one can drink water that contains more radiation than 4 mrem/yr (0.4 mSv/yr). So if any radioactive waste exempted by the NRC resulted in more than 4 mrem/yr (0.4 mSv/yr) in the groundwater, the organization producing the waste would have to abide by the EPA's standard. Mr. Guimond expressed hope that any implementation of the NRC's

(continued on page 28A)

(continued from page 24A)

BRC policy would ensure the safety of groundwater.

Warren Sinclair, PhD, President of the National Council on Radiation Protection and Measurements (NCRP), says that the NRC's BRC policy is headed in the right direction but that he has one major reservation, namely, the justification issue. The NRC says, "Justification of practice is recognized by health physics professionals and national and international organizations as one of the three fundamental tenets of radiation protection (justification, dose limits, and ALARA). The Commission has prepared this policy statement in conformance with these basic tenets as appropriate for exemption decisions. The Commission believes that justification decisions involving social and cultural value judgements should be made by affected members of society and not the regulatory agency. Consequently, the Commission will not consider whether a practice is justified in terms of net societal benefit." Dr. Sinclair believes that the NRC "disclaimer" is a mistake and that any agency that is mandated to protect the public has the responsibility to make a decision on whether its practices are justifiable. As Dr. Sinclair notes, "Justification first is the basic tenet of those who deal with radioactive material."

The U.S. Council on Energy Awareness (USCEA), an organization that represents the nuclear power industry, supports the NRC's contention that there is a level of radioactivity low enough to be below regulatory concern. However, according to Scott Peters, media services manager for the USCEA, the Council will not petition the NRC to implement the new BRC policy at this time, because it anticipates an extremely negative public reaction. Mr. Peters noted that the public's fear of all radiation is unfounded and is based on a lack of radiation education. The USCEA states that the BRC is within range of being workable and safe.

The Society of Nuclear Medicine (SNM) and the American College of Nuclear Physicians (ACNP) favor the concept of the NRC's policy but say it should not be implemented in its present form. In written comments submitted to the House Energy and Environment Subcommittee, the SNM and the ACNP said that the current policy should be refined before it is considered a final policy. "Initial analysis indicated that the figures on which the NRC based its statement are overestimated and incomplete. Should the NRC collect and reorganize the appropriate data, a BRC policy could be easily argued as reasonable and acceptable." The SNM and the ACNP say the policy should have followed a public education program.

Some of the opposition that the NRC faces over its new BRC policy arises from disagreement over what constitutes acceptable risk. In setting its guidelines, the NRC has relied on the "linear, no threshhold" theory, which states that "the chance of developing cancer is linearly proportional to the [radiation] dose and that there is no threshhold below which there is no chance of cancer. This chance, or risk, is expressed in terms of probability because a given dose of radiation does not produce a cancer in all cases." The NRC states that its philosophy is to keep radiation exposure "as low as is reasonably achievable" and says the public will face a very small increase in the risk of death from a radiation-induced cancer (1 in 200,000 annually for 10 mrem/yr [0.1 mSv/yr]) as a consequence of easing restrictions.

The new BRC policy will be implemented principally through the NRC rulemaking process, although exemption decisions may also be made through specific licensing actions. As each case is reviewed, the proposed rules will be published for public comment in the *Federal Register.*

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(continued from page 25A)

among the public and the government towards radiation. "The pendulum seems to swinging further and further toward a complete phasing out of radiation-related practices," says Dr. Brill. "I am worried that legislators and the public might conclude that if nuclear medicine can function with a 20 mSv/yr limit, why not 15 mSv/yr? Or 10? Or 5? It's getting to the point where the very existence of nuclear medicine could be threatened if these maximum permissible dose limits continue their downward spiral."

In a draft statement of response to the ICRP's proposed recommendations, The Society of Nuclear Medicine and the American College of Nuclear Physicians (SNM/ACNP) question the validity of the epidemiologic data on which the Commission based its new protection guidelines. The SNM/ACNP statement affirms that the ICRP erroneously makes the assumption that exposure to low dose rates and high dose rates are equally hazardous — and contends that the high dose/high dose rate data from the Japanese bombings of World War II cannot be applied to the low dose/low dose rate scenario of nuclear medicine. Furthermore, the SNM/ACNP argue that "before adjusting radiation protection policies that have always been on the conservative side even further, it seems appropriate to wait until there is better scientific data upon which to base decisions that impact on the cost and benefits [of] the productive use of radiation in medicine."

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