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Consideration on Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

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Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation

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General Comment

NOTE -- this is PART 1 of a submission that will include an appended portion that is not in this document. The beginning will be the same, but the second will be complete. Filing for purposes of redundancy rather than missing the deadline

Attachments

PART 1 NIRS supplemental comments WCD scoping

SUNSI Review Complete
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Supplemental Comments of Nuclear Information and Resource Service (NIRS) in response to the U.S. Nuclear Regulatory Commission's "Request for comments on the notice of intent to prepare and (sic) environmental impact statement and notice of public meetings" ("Notice"), 77 Fed. Reg. 65,137 (October 25, 2012) ("Scoping Notice").

NIRS has contributed additional comments to this scoping period: in person and on the phone during the November 14, 2012 meeting in Rockville, MD and during the on-line Webinar offered December 6, 2012, as well in a letter to the Commissioners dated November 8, 2012 and in group comments dated January 2, 2013.

These additional comments from NIRS are intended to add a few additional points under the National Environmental Policy Act's opportunity for participation in determining the scope of the analysis NRC will do on storing the waste that contains over 95% of the radioactivity in all the waste the USA has generated since the inception of fission; these comments do not supersede NIRS' other contributions.

1) Environmental Impact ≠ Compliance With NRC Regulations
We expect to see the statement of IMPACT, not assertion of compliance with NRC regulations. This is particularly important in the case of evaluation of radiological releases, leaks, any other type of uncontained radioactivity and the health (disease) consequences of radiation exposure. NRC regulations do not provide a "zero risk" basis to the public, therefore compliance is not an accurate statement of no impact.

2) Disclose the Basic Assumptions Used to Assess Health Consequences
Where radiological risk is assessed in this process, NRC should disclose the dose-response assumptions used to report impact/risk levels. If the NRC risk-evaluation disclosed in a 1990 Federal Register notice of the "Expanded Below Regulatory Concern Policy" that assessed a 100 millirem annual exposure over 70 years lifetime to result in 3.5 fatal cancers per 1000 people (should have read "adult males" exposed) is used, that should be disclosed; if some other dose-response assessment is used, that should be disclosed. If it is different than the 1990 evaluation, there should be a discussion offered as to why a different basis of risk assessment is used.

3) NRC Should Assume "Dose Receptor" is Female, Aged 0--5
In order to provide a more accurate evaluation of health impact, NRC should assume that the most vulnerable part of our species is the one getting the dose: specifically, the female between age zero and 5 years old. It would be appropriate perhaps to provide a table of risk assessment comparing ages and genders and possibly multiple evaluations of radiological harm (for instance NRC, BEIR VII, ECRR and Gofman's reanalysis of the Hiroshima/Nagasaki data). In this way,

NRC could provide a range of information for decision and policy makers that on the one hand displays the range of variation of assessment, and on the other discloses the degree to which radiation risk assessment has under-reported the true impacts to human health via radioactivity since in general, only the adult male is factored.

Radiological consequences of fuel pool fires and leaks are mandated by the Sentelle decision; NIRS hopes the radiological impact of dry storage and cask transport also will be evaluated.

4) The "underpinning" of literature review for this evaluation should explicitly include the body of work on waste storage accomplished by the Department of Energy's former "Office of Civilian Radioactive Waste Management"--specifically the work brought together under the banner of "System Architecture" which was a cradle-to-grave system's analysis for waste handling and storage and transport as part of a national repository program (circa 1995).

5) Factor the "Day of the Drop" in each action and scenario evaluated
NIRS has a portion of the "institutional" knowledge from the DOE's "System Architecture" since NIRS staff participated in the DOE's week-long program in which DOE staff educated non-government staffers on high-level radioactive waste storage, handling and transport. DOE staffers emphasized that everything in the system was designed for the "Day of the Drop:" the day the structural integrity of the fuel rod cladding fails and instead of the "geometry" of fuel assemblies, one now has the geometry of a pile of fuel pellets.

It can be hoped that fuel rod integrity is high and that the "Day of the Drop" will happen in the distant future, but this cannot be assumed and NRC has been directed to consider extending storage into what must be assumed to be the distant future. Each and every storage option evaluation must include the assumption that fuel rod integrity is lost in part or all of the fuel in storage.

This is a reasonable assumption given a number of factors--all of which require further research, but precaution dictates assuming a bounding case, not the best case. Such factors include the high percentage of high-burn-up fuel that has been subjected to greater heat and radioactivity and will have higher residual heat as well; well documented cases of variability in the quenching of the zircaloy tubes used for fuel cladding and the rising percentage of already failed fuel in storage now.

6) Electricity production is not what NRC licenses; it is the production of this waste. This activity needs to include a Homeland Security assessment for compatibility with national security as part of this EIS. In addition, peer reviewed and federal assessments of sea-level rise and climate instability should be factored against the continued production of this material.

7) NRC should factor the potential impacts (security, social) of foreign ownership of this waste.

8) Dry cask storage was undertaken without sufficient study and technical evaluation. NRC has ignored whistle-blower information from Oscar Shirani; see:
http://www.nirs.org/radwaste/atreactorstorage/shiranialleg04.htm as well as events that happened during the early cask loading activities including the generation of hydrogen inside the loaded

cask prior to evacuation of the coolant liquid. One of these events (Point Beach) included the rapid (explosive) ejection of an enormously heavy shield plug of the cask lid. If this object had landed in the fuel pool (the event occurred on the deck of the pool) it had the capacity to punch a big hole; the subsequent drain down would not have been easily reversed.

9) NRC must bound the possibilities of fuel pool catastrophe--a drain down due to an event such as the Point Beach hydrogen explosion and cask lid ejection—and not simply assume a boil off where replacement of coolant can be expected.

10) NRC must include the real-world cases at Fukushima: Melted fuel melting through the reactor vessel and potential for continued cooling BWR with structural damage creating potential for pool failure with no cooling option.

11) NRC should include sufficient analysis in this EIS to form the basis for new regulations requiring dry storage of excess fuel ("excess" to be defined as any fuel remaining in the cooling pool longer than the time of cooling in liquid required before transfer to dry storage). If NRC does not itself initiate promulgation of such a regulation, it may receive this as an early notice of intent to petition for rulemaking.

12) In evaluation of the radiological impact to the public of moving highly radioactive spent fuel to central storage, the "dose receptor" must be assumed to be female aged 0--5. In case NRC staff have forgotten their evolutionary biology, there is no individual who is born who did not come as progeny of a female who was once 0--5. This is not a "special case," this IS the "average human" and in terms of the future of our species, it is every human.

13) In evaluation of fuel pool leaks, NRC must include an assessment of impact on so-called "low-level" radioactive waste types and volumes assuming complete exhumation of contaminated soil.

14) Pyrophoria should be assumed as a persistent condition of commercial reactor fuel, not limited to the first years out of the reactor core. Because a non-oxygen environment is assumed to be a primary means of preventing burning of fuel clad, NRC evaluation should include the potential for leaks in cask seals, both stationary casks, and transport containers.

15) Commissioner McFarlane asserts that no-action would be for NRC to dispense with a "waste confidence" decision and instead do a site-specific analysis for the storage of waste for purposes of licensing. This should be evaluated, as should an action alternative of not granting any more licenses for waste generation.

16) Since the industry is talking about "liquid fuel" types, all of the above must include an assessment of possible future wastes from possible future liquid fuels.

Respectfully Submitted.