

**Gallagher, Carol**

**Subject:** FW: NRC Federal Register notice (77 FRN 65137) for Waste Confidence EIS and Scoping - EPA Comments  
**Attachments:** WCR NOI - EPA Comments.pdf

---

**From:** Rountree.Marthea@epamail.epa.gov [mailto:Rountree.Marthea@epamail.epa.gov]  
**Sent:** Thursday, January 24, 2013 4:35 PM  
**To:** Lopas, Sarah; Imboden, Andy  
**Subject:** NRC Federal Register notice (77 FRN 65137) for Waste Confidence EIS and Scoping - EPA Comments

Sarah/Andy

EPA comments on the NOI for the Waste Confidence EIS are attached. Please let me know if you have any questions.

Thank you so much for your patience.  
(See attached file: WCR NOI - EPA Comments.pdf)

Regards,

MR

Marthea Rountree  
Environmental Engineer  
Environmental Protection Agency  
OFA, NEPA Compliance Division, OECA  
1200 Pennsylvania Ave., NW  
AR Bld., Rm 7239 A (MC 2252A)  
Washington, DC 20460

Phone - 202-564-7141  
Fax - 202-564-0072

10/25/2012  
77 FR 65137

165

RECEIVED

2013 JAN 25 AM 10:06

RULES AND DIRECTIVES  
BRANCH  
USAFRC

SUNSI Review Complete  
Template = ADM - 013  
E-RIDS = ADM -03  
Add = S. Lopas (5112)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
WASHINGTON, D.C. 20460

JAN 24 2013

OFFICE OF  
ENFORCEMENT AND  
COMPLIANCE ASSURANCE

Cindy Bladey  
Chief, Rules, Announcements, and Directives Branch (RADB)  
Office of Administration  
Mailstop TWB-05-B01M  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

Dear Ms. Bladey:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality's (CEQ) NEPA regulations, the Environmental Protection Agency (EPA) has reviewed the Nuclear Regulatory Commission's (NRC) Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) to support the rulemaking to update the Commission's Waste Confidence Decision and Rule. The Docket ID is NRC-2012-0246. The Waste Confidence Decision and Rule represent the Commission's generic determination that spent nuclear fuel can be stored safely and without significant environmental impacts for a period of time after the end of the licensed life of a nuclear power plant.

We appreciate the opportunity to review and comment on this NOI. We look forward to reviewing both the preliminary draft and draft EISs related to this project. If you have any questions, you may contact me at (202) 564-5400. You may also call my staff point of contact, Marthea Rountree at (202) 564-7141.

Sincerely,

A handwritten signature in black ink that reads "Susan E. Bromm".

Susan E. Bromm  
Director  
Office of Federal Activities

Enclosure

**EPA's Scoping Comments on NRC's Notice of Intent to prepare an EIS to support the rulemaking to update the Commission's Waste Confidence Decision and Rule**

1. The NOI indicates "Possible scenarios to be analyzed in the EIS include temporary spent fuel storage after cessation of reactor operation until a repository is made available in either the middle of the century or at the end of the century, and storage of spent fuel if no repository is made available by the end of the century."

a. We recommend that NRC specify the time periods considered for reliance on temporary spent fuel storage rather than assume the availability of a repository in the "middle of the century" or "end of the century." For example, we believe it is appropriate to evaluate a 60-year time period, post operation cessation, for storage, consistent with the most recent revision to the rule.

b. We also recommend that the scenario of storage of spent fuel if no repository is made available by the end of the century consider the impacts of indefinite duration of institutional control over spent nuclear fuel storage. Such impacts could reasonably include repair or replacement of infrastructure or containment (for example, one major repair during the first 100 years and replacement every 100 years thereafter), as well as the potential cessation of active management controls (for example, after 300 years of storage).

2. The spent nuclear fuel (SNF) canister's drying process leaves some moisture remaining inside storage canisters after they are sealed. The high radiation field inside canisters would interact with water vapor producing radiolytic hydrogen. Additional moisture also can preferentially diffuse inside canisters through microcracks due to pressure differentials inside and outside the canister caused by cooling of the fuel. For these reasons EPA recommends assessing the generation and accumulation of hydrogen inside SNF dry cask storage canisters due to radiolysis.

3. As SNF cladding and canister welding degrade with time, the canister will gradually depressurize through microcracks and confinement could be compromised. Radioactive materials may begin releasing to the environment at relatively slow rates. Current effluent monitoring programs at controlled site boundaries are typically not sensitive enough to detect such releases at early stages and, furthermore, may not necessarily be assumed to continue after plant decommissioning. We recommend, therefore, evaluating potential releases due to canister and cladding degradation. In assessing the probabilities and impacts of such scenarios, EPA recommends considering best available industry data, current scientific knowledge and well-documented trends regarding SNF inventories and material degradation. The behavior of

cladding for high-burnup SNF deserves particular attention since the average burnup is likely to increase in the near future. (See also Comment #5.)

4. Because this is a generic EIS the bounding values, frequencies, rates of occurrence and conditions should be considered as inputs for scenario analyses. EPA recommends considering bounding rates for normal events including periodic repackaging, anticipated occurrences and accidents in worker and public exposure scenarios related to SNF storage after the licensed end of a nuclear plant. Bounding values should also be considered for other key parameters such as the frequency of natural disruptive events, human errors, manufacturing errors, and fuel loading errors; fuel degradation and heat output; fuel type, burn-up and radionuclide inventory; criticality safety; etc.

5. EPA recommends that analyses consider the potential effects of higher fuel burn-up. Higher burn-up generally results in increased levels of oxidation and hydriding of the cladding; higher fuel rod internal pressures due to higher fission gas release from the fuel pellets; and, consequently, higher hoop stresses in the cladding. EPA recommends that these phenomena be evaluated for their effects on fuel integrity during storage as well as during subsequent management operations including transportation, retrieval and placement in a waste package, and, eventually, disposal. Mechanical properties of specific interest include creep, ductility under impact load conditions, and fracture toughness. These properties determine the ability of the cladding to maintain the fuel in the configuration that is, or will be, used for fuel storage licensing analyses, specifically in the criticality, shielding, and retrievability evaluations. High burn up may increase the risk of radioactive releases as the fuel cladding gets thinner. This increased risk persists throughout storage and disposal. High burn-up spent fuel will be hotter and more radioactive and therefore impose higher heat loads, require packaging with improved heat transfer capacity, and new materials that can withstand the effect of higher temperatures on components and materials. As discharge burn-up levels continue to increase, probabilistic risk assessments need to include these effects on the cladding mechanical properties important to transportation, handling, and disposal operations involved in closing the fuel cycle.

6. The analysis of external events should address the potential for and impacts of fuel pool fires, as identified by the D.C. Circuit Court (*New York v. NRC*, 681 F.3d 471 (D.C. Circuit 2012)). Presently the majority of spent nuclear fuel is stored in spent fuel pools in high density configuration. Through either accident or deliberate act, there is the potential for loss of coolant and potentially fire. If a fire were to occur, it is possible that spent fuel in the pool would combust and disperse radioactive particulate matter. We also recommend the draft EIS discuss the likelihood of maintaining pool storage for extended periods after cessation of plant operations. While some period of pool storage will be necessary, it seems likely that dry cask storage will be predominant over the longer time periods considered in the analysis.

The U.S. Nuclear Waste Technical Review Board (NWTRB) report on "Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel" (December 2010) is a valuable source of information independent from NRC that can be used to guide the analysis of external events. Use of the event list developed by a credible independent source would raise level of credibility of the SNF EIS under development. EPA suggests analyzing normal, off-normal events and accidents (i.e., manmade and natural events) as they were identified in this report.

7. EPA recommends holding regional meetings to discuss the EIS in major population centers (such as New York City) that have a number of nuclear power plants and SNF storages in close proximity.