PUBLIC SUBMISSION

As of: 3/31/16 10:40 AM
Received: March 28, 2016
Status: Pending_Post
Tracking No. 1k0-8orc-yvx2
Comments Due: March 28, 2016
Submission Type: Web

Docket: NRC-2015-0234
A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios

Comment On: NRC-2015-0234-0001
A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios; Draft NUREG/CR-7209; Request for Comment

Document: NRC-2015-0234-DRAFT-0044
Comment on FR Doc # 2016-01654

42

Submitter Information

1/27/2016

Name: Robert Halstead

81 FR 1680

General Comment

See attached file(s)

Attachments

NANP Preliminary Comments NUREG-CR-7209 Draft Report

SUNSI Review Complete
Template = ADM – 013
E-RIDS= ADM-03
Add= J. Chang (PXC4)

BRIAN SANDOVAL
Governor

STATE OF NEVADA

ROBERT J HALSTEAD
Executive Director

OFFICE OF THE GOVERNOR
AGENCY FOR NUCLEAR PROJECTS
1761 E. College Parkway, Suite 118
Carson City, NV 89706-7954
Telephone (775) 687-3744 • Fax (775) 687-5277
E-mail: nwpo@nuc.state.nv.us

March 28, 2016

Cindy Bladey, Chief
Rules, Announcements, and Directives Branch (RADB)
Division of Administrative Services
Office of Administration
Mail Stop: OWFN-12-H08
US Nuclear Regulatory Commission
Washington, DC 20555-0001

Docket ID: NRC-2015-0234, A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios, NUREG/CR-7209, Draft Report for Comment

Dear Chief Bladey:

The State of Nevada Agency for Nuclear Projects submits the attached preliminary comments in response to the Federal Register notice published January 27, 2016 (81 FR 4680-4681).

We will submit additional comments on this report and its conclusion that current NRC regulations and packaging standards protect public health and safety against releases of radioactive material during real-life transportation accidents, after we receive the documents requested on March 21, 2016, under the Freedom of Information Act.

Sincerely,

Robert J. Halstead
Executive Director

RJH/sjh
Enclosure
cc
Governor Brian Sandoval
Attorney General Adam Laxalt
Nevada Congressional Delegation
Chairman Richard Bryan, Nevada Commission on Nuclear Projects

State of Nevada
Office of the Governor
Agency for Nuclear Projects
Preliminary Comments
On
A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios,
NUREG/CR-7209,
Draft Report for Comment
Docket ID: NRC-2015-0234
March 28, 2016

State of Nevada Freedom of Information Act Request for Documents

Pursuant to the Freedom of Information Act ("FOIA"), 55 U.S.C. 552, legal counsel for the State of Nevada on March 21, 2016, requested that NRC provide all documents[1] in its possession meeting the following descriptions, with respect to NUREG/CR-7209 ("A Compendium of Spent Fuel Transportation Package Response Analyses to Severe Fire Accident Scenarios"), whose preparation is referred to below as "the project":

1. All documents related to the history of "the project," including all documents discussing the initial decision to summarize studies of truck and rail transport accidents involving fires, relative to regulatory requirements for shipment of commercial spent nuclear fuel, the selection of the contractor, all communications to and from any potential or actual contractor, the original project schedule, or the actual start work date and conclusion;

2. All documents and communications related to any direct involvement by members of the Commission in this project;

3. All documents related to or disclosing the total cost of, and/or budget details for, the project, including contractor costs and NRC staff costs;

4. All documents related to any peer review of the report by any person or entity, including selection of peer reviewers, cost of peer review, peer review comments, and/or resolution of any concerns raised during peer review; and

5. All documents related to or containing any comments by NRC staff members as part of the peer review, or NRC staff comments in addition to the peer review.

[1] "Documents," in this regard, should be given the broadest possible interpretation, to include, without limitation, all electronic documents and hard copies, tapes, CD-ROMs, notes, letters, papers, books, reports, graphics, studies and files, together with any associated compilations.

We appreciate the prompt reply by the NRC FOIA Officer, dated march 21, 2016, estimating that completion of our request would be on or before April 18, 2016. Completion by this date would facilitate further review and comment by our staff and contractors.

Inadequate Time for Public Review and Comment

The 60-day comment period is inadequate. The scope of the report, and the technical complexity of the subject matter, justify a longer comment period of at least 90 days and, preferably, 120 days. Specific technical issues, such as the selection of shipping cask designs and fire accident scenarios for analysis, have required that our agency contract with an outside technical reviewer to assist us in preparing our comments.

Please assist us in understanding how the original 60-day comment period was established by answering the following questions:

- When did the concept for this project originate?
- When did the contractors at Pacific Northwest National Laboratory begin work on this project?
- When did the peer review occur, and how long was the peer review period?
- What efforts were made by NRC to solicit stakeholder comment on this project, prior to completion of the draft report in October 2015?

Potential Implications of NUREG/CR-7209 for NRC Licensing Proceedings

Finalization of Draft Report NUREG/CR-7209 could have significant implications for the evaluation of transportation impacts in future NRC licensing proceedings for interim storage facilities and geologic disposal facilities.

NRC administrative law judges have already established the ground rules for evaluation of transportation impacts under the National Environmental Policy Act (NEPA) in the currently suspended licensing proceeding for the proposed Yucca Mountain repository:

> Transportation of nuclear waste is a foreseeable consequence of constructing a nuclear waste repository. As California persuasively argues, "[w]ithout transportation of the waste to it, Yucca Mountain would be just a very large, fancy, and expensive hole in a mountain." The Commission, for example, has stated that there can be "no serious dispute" that the NRC's environmental analysis in connection with licensing nuclear facilities should extend to "related offsite construction projects – such as connecting roads and railroad spurs." Likewise, there can be no serious dispute that the NRC's NEPA responsibilities do not end at the boundaries of the proposed repository, but rather extend to the transportation of nuclear waste to the repository. The two are closely interdependent. Without the repository, waste would not be transported to Yucca Mountain. Without transportation of waste to it, construction of the repository would be irrational. Under NEPA, both must be considered. [2]

[2] NRC, Atomic Safety and Licensing Boards, Memorandum and Order Identifying Participants and Admitted Contentions, Docket N0. 63-001-HLW (May 11, 2009).

As part of the Yucca Mountain licensing process, NRC staff reviewed and adopted the 2008 U.S. Department of Energy (DOE) Final Supplemental Environmental Impact Statement (FSEIS) for Yucca Mountain (DOE/EIS-0250F), including the transportation impact calculations for the mostly rail transportation scenario.[3]

As part of its finalization of Draft Report NUREG/CR-7209, NRC staff must assess the implications of the findings and conclusions of the Draft Report for the FSEIS transportation impact calculations adopted by NRC staff in the Yucca Mountain licensing proceeding. The DOE FSEIS adopted by NRC staff evaluated the consequences of release of radioactive material as a result of the maximum reasonably foreseeable transportation accident (probability about 5 in one million per year), involving a fully engulfing fire, 34 rem dose to the maximally exposed individual, 16,000 person-rem population dose and 9.4 latent cancer fatalities in an urban area, and cleanup-costs of $300,000 to $10 billion. [FSEIS, Pp.6-15, 6-24, G-56]

Potential Implications of NUREG/CR-7209 for Full-Scale Cask Testing

None of the spent fuel shipping casks currently used in the United States has been tested full-scale to confirm their performance in regulatory or extra-regulatory fire accident scenarios. NUREG/CR-7209 should make this fact clear to readers, and explain that none of the four casks evaluated (GA-4, HI-STAR 100, NAC-LWT, and TN-68) has been subjected to full-scale testing for any of the four hypothetical accident conditions (impact, fire, puncture, and immersion) set forth in 10 CFR Part 71.

In 2006, the National Academies (NAS) report, Going the Distance? endorsed full-scale testing of shipping casks under certain conditions. The Draft NUREG/CR-7209 cites this NAS report regarding fire accident scenarios, but does not address the NAS recommendations regarding full-scale cask testing. The NAS finding and recommendation are as follows:

> "FINDING: The committee strongly endorses the use of full-scale testing to determine how packages will perform under both regulatory and credible extra-regulatory conditions. Package testing in the United States and many other countries is carried out using good engineering practices that combine state-of-the-art structural analyses and physical tests to demonstrate containment effectiveness. Full-scale testing is a very effective tool for both guiding and validating analytical engineering models of package performance and for demonstrating the compliance of package designs with performance requirements. However, deliberate full-scale testing of packages to destruction through the application of forces that substantially exceed credible accident conditions would be marginally informative and is not justified given the considerable costs for package acquisitions that such testing would require.

[3] NRC, U.S. Nuclear Regulatory Commission Staff's Adoption Determination Report for the U.S. Department of Energy's Environmental Impact Statements for the Proposed Geologic Repository at Yucca Mountain, Pp. 3-13, 3-15, 5-1 (September 5, 2008).

RECOMMENDATION: Full-scale package testing should continue to be used as part of integrated analytical, computer simulation, scale model, and testing programs to validate the performance of package performance. Deliberate full-scale testing of packages to destruction should not be carried out as part of this integrated analysis or for compliance demonstrations."

Why did NRC not address full-scale testing as proposed by the NAS in the Draft Report? How might the findings of NUREG/CR-7209 be used to support full-scale cask testing as proposed by the 2006 NAS report?

In 1999, NRC began the process of developing a cask testing demonstration study as part of the Package Performance Study (PPS). The most recent NRC testing proposal (SECY-05-001), approved by the Commission in June 2005, called for a demonstration test in which a cask mounted on a railcar is impacted by a speeding locomotive, and then subjected to a 30-minute fully engulfing fire. "The staff's proposed test plan as provided in this SECY is not the final word on this issue, as the project is subject to additional modifications and Commission direction once additional information becomes available."

Why did NRC not address full-scale testing as proposed in SRM SECY-05-0051 in the Draft Report? How might the findings of the NUREG/CR-7209 be used to support full-scale cask testing as proposed in SECY-05-0051?

Cask Designs Chosen for Analysis

Draft NUREG/CR-7209 does not adequately explain why certain shipping cask designs were selected for analysis, and why other cask designs were not selected.

Information provided by NRC to Nevada's U.S. Senators Harry Reid and Dean Heller in December 2015 indicates that the following packages have been approved, under 10 CFR Part 71, or are under review, by the NRC for transport of spent nuclear fuel or high-level waste:

- NAC-LWT (Docket No. 71-9225)
- GA-4 (Docket No. 71-9226)
- 2000 (Docket No. 71-9228)
- NAC-STC (Docket No. 71-9235)
- TN-FSV (Docket No. 71-9253)
- NUHOMS® MP187 Multi-Purpose Cask (Docket No. 71-9255)
- HI-STAR 100 System (Docket No. 71-9261)
- UMS Universal Transport Cask Package (Docket No. 71-9270)
- FuelSolutions™ TS125 Transportation Package (Docket No. 71-9276)
- TN-68 Transport Package (Docket No. 71-9293)
- NUHOMS®-MP197, NUHOMS®-MP197HB (Docket No. 71-9302)
- TN-40 (Docket No. 71-9313)
- HI-STAR 180 (Docket No. 71-9325)

- HI-STAR 60 (Docket No. 71-9336)
- BEA Research Reactor (BRR) Package (Docket No. 71-9341)
- TN-LC (Docket No. 71-9358
- HI-STAR 180D (Docket No. 71-9367)
- M-140 (Docket No. 71-9793) (Naval Reactors)
- M-290 (Docket No. 71-9796) (Naval Reactors)

Two of the 19 package designs listed above are classified as confidential – restricted data because they are for naval reactors use. For the 17 designs that are not confidential, please provide the reasons why each one was, or was not, selected for analysis in NUREG/CR-7209.

The final version of NUREG/CR-7209 should explain in detail why the GA-4 truck cask was selected for detailed analysis in all three highway fire accident scenarios. The GA-4 cask, to our knowledge, has never been used for spent fuel transportation in the United States. As we understand it, the GA-4 cask has never even been fabricated full-scale.

The final version of NUREG/CR-7209 should explain in detail why the NAC-LWT truck cask was not selected for detailed analysis in the MacArthur Maze fire accident scenario. The NAC-LWT cask, to our knowledge, is the primary truck cask currently available for spent fuel transportation in the United States. Failure to evaluate the performance of the truck cask used for the majority of U.S. spent fuel shipments over the past four decades, in the most severe highway fire accident scenario identified in the report, undermines the purported finding "that current NRC regulations and packaging standards provide a high degree of protection to the public health and safety against releases of radioactive material during real-life transportation accidents." (Page 8-2)

Fire Accident Scenarios Chosen for Analysis

NUREG/CR-7209 does not consider the Lac-Mégantic, Quebec rail accident and resulting fire that took place on July 6, 2013. Lac-Mégantic, is located in the Eastern Townships of the Canadian province of Quebec. An unattended 74-car freight train carrying Bakken Formation (North Dakota) crude oil rolled down a 1.2% grade hill from Nantes and derailed in downtown Lac-Megantic, resulting in the fire and explosion of multiple tank cars. Forty-two people died and half the town was destroyed. After 20 hours, the center of the fire was still inaccessible to firefighters. It is not obvious why this rail accident was not included in NUREG/CR-7209, since the Draft Report also includes references from the year 2015, two years after the Lac-Megantic fire. PNNL had the time to investigate and evaluate this rail accident. As a result of this accident, shipments from North Dakota have been rerouted along rail lines in the USA. Many of these rail lines are the same routes identified by the U.S. Department of Energy in its 2008 FSEIS as potential shipping routes from nuclear reactors to Yucca Mountain. Similar derailments of oil tanker shipments involving nuclear fuel shipments could occur in the U.S.

NUREG/CR-7209 also does not consider the 1984 Summit Tunnel rail accident in Great Britain. This accident involved a tunnel fire with temperatures that reached 1530 °C, far hotter than temperatures in the fire accident scenarios evaluated by PNNL. While the Summit Tunnel is

unique, that accident shows that hydrocarbon fires can be much hotter than those considered in NUREG/CR-7209.

As shown by DOT data, while the probability of rail accidents has been declining, the accident rate for rail fires has been increasing. This is due to the fact that more oil has been moving by rail, primarily from the Bakken formation oil field in North Dakota to coastal refineries in the U.S. East, South, and West. While the total train accident rate declined between the years 2004 and 2013, the fire accident rate (which includes all fires, not just petroleum fires) is actually increasing. For the U.S. as a whole, the fire accident rate in the year 2013, was over twice as great as calculated by Sprung in NUREG/CR-6672.

NUREG/CR-7209 also argues that long duration fires in a tunnel are unlikely because of poor ventilation and in the open environment, long duration fires are not possible because many railroad tracks are elevated above grade and are constructed on porous substrate. That is, according to NUREG/CR-7209, pooling of spilled flammable liquid is less likely in an open environment when compared with a tunnel environment, where the rail bed surface is often rock, concrete, or pavement. Historically many of the fires resulting from rail accidents have involved the leakage of flammable gas (such as propane), rather than a liquid.

These arguments in NUREG/CR-7209 are contrary to the facts regarding oil train fires. With train loads of oil tanker cars, in an open environment, fire often follows a derailment. As at Lac-Megantic, rail cars may be jumbled, one on top of the other. A fire over-pressurized nearby cars and a major conflagration ensued. With trains hauling 100 oil tankers, we are no longer talking about "pooling" of oil from one car. That is an outdated concept. Further, with a major fire, firefighters and emergency personnel cannot get close to the fire, for fear of additional cars exploding. Firefighters could not approach the fires in Lac-Megantic.

Findings and Conclusion

The findings reported in the four fire accident scenario case studies do not clearly support the conclusion stated in the Abstract.

"The combined summary of this work on fire accidents demonstrates that current U.S. Nuclear Regulatory Commission regulations and packaging standards provide a high degree of protection to the public health and safety against releases of radioactive material in real-world transportation accidents, were such events to involve SNF containers." (p.iii)

In fact, NUREG/CR-7209 reports computer modeling of cask performance in four selected severe accident fires that could potentially threaten public health and safety. In each case, the predicted fire conditions caused at least one of the simulated casks to fail (Pages 7-1, 7-2, 7-5, 7-7, and 7-10). This is a significant finding that the Draft Report should have addressed in much greater detail. Moreover, historical accidents involving severe impacts, puncture, and/or immersion, combined in different sequences with severe fires, might further challenge cask integrity. These findings suggest that the NRC may need to reexamine cask safety standards.