Russell Jim <russell@yakama.com> on 09/20/2001 04:03:17 PM

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To: ymp_sr@ymp.gov
cc:

Subject: comments on yucca psse

Part of Records Package / Supplement / Correction

- yucca psse 01.doc
- yucca psse 2.doc

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September 20, 2001

Ms. Carol Hanlon
U.S. Department of Energy
Yucca Mountain Site Characterization Office
M/S #025
P.O. Box 30307
North Las Vegas, Nevada 89036-0307

YMP_SR@ymp.gov
Fax 1-800-967-0739

Dear Ms. Hanlon:

Please find enclosed comments by the Yakama Nation on the U.S. Department of Energy (DOE) Yucca Mountain Preliminary Site Suitability Evaluation (PSSE), DOE/RW-0540, July 2001.

As you will note, the Yakama Nation is concerned that DOE may not be fulfilling the intent of Congress in the Nuclear Waste Policy Act (NWPA), as amended, PL 97-425, 96 Stat. 2201, with regard to DOE's responsibility under the NWPA to permanently isolate all of the nation's high-level radioactive waste and spent nuclear fuel in a repository.

It is requested that if the comments provided are determined by DOE to be outside the scope of the PSSE, that you provide reference to the specific documents which encompass the scope of these comments, and the offices within DOE (or other agencies) in which these issues are being addressed.

Thank you in advance for you reply. I may be reached at (509) 452-2502.

Sincerely,

Russell Jim, Manager
Environmental Restoration/Waste Management Program

Enclosure

cc: Duane Clark, Chairman, YN RHW Committee
Carroll Palmer, Deputy Director, YN DNR

2

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COMMENTS
ON THE
YUCCA MOUNTAIN
PRELIMINARY SITE SUITABILITY EVALUATION

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
DOE/RW-0540
July 2001

SUBMITTED BY
ENVIRONMENTAL RESTORATION/WASTE MANAGEMENT PROGRAM
DEPARTMENT OF NATURAL RESOURCES
YAKAMA NATION

PREFACE

The comments submitted herein by the Yakama Nation address issues in the Yucca Mountain Preliminary Site Suitability Evaluation (PSSE.) However, as noted below, the most significant issue involved with a potential repository at Yucca Mountain is not ultimately the relatively narrow issue of the suitability of the Yucca Mountain site, but whether the overall direction and intent of Congress expressed in the Nuclear Waste Policy Act is being implemented. That direction and intent, to permanently isolate spent nuclear fuel and high-level radioactive waste from the biosphere, will require a nationwide plan for the entire storage, treatment, and disposal system as informed by a comprehensive and integrated risk assessment.

The Nuclear Waste Policy Act of 1982, as amended, PL 97-425, 96 Stat. 2201 states

Sec. 111(a)(7)

> "high-level radioactive waste and spent nuclear fuel have become major subjects of public concern, and appropriate precautions may be taken to ensure that such waste and spent fuel do not adversely affect the public health and safety and the environment for this or future generations."

Sec. 111(b)

> "Purposes.-The purposes of this subtitle are-"

Sec. 111(b)(1)

x 3

"to establish a schedule for the siting, construction, and operation of repositories that will provide a reasonable assurance that the public and the environment will be adequately protected from the hazards posed by high-level radioactive waste and such spent nuclear fuel as may be disposed of in a repository;"

Federal Register / Vol. 66, No. 162, Tuesday, August 21, 2001 states

"Summary: The Department of Energy (the Department) announces the scheduling of public hearings on the possible recommendation by the Secretary of Energy to the President of the Yucca Mountain Site in Nevada for development as a spent nuclear fuel and high-level nuclear waste geologic repository, pursuant to Section 114(a)(1) of the Nuclear Waste Policy Act of 1982 (NWPA), as amended. The Department also announces the availability of the Yucca Mountain Preliminary Site Suitability Evaluation (PSSE) for the Yucca Mountain site in Nevada and the date for the closure of the public comment period on the Secretary's consideration of a possible site recommendation."

II. Opportunity for Public Comment
A. Participation in Comment Process

"Interested persons are invited to participate in the comment process by submitting written data, views, or comments with respect to the possible recommendation of the Yucca Mountain site. The Department encourages the maximum level of public participation possible in this process. Individuals, coalitions, states or other government entities, and others are urged to submit written comments on technical, policy or other issues related to the possible recommendation of the Yucca Mountain site."

The Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Volume II, Appendixes A through L, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, DOE/EIS-0250D, July 1999 states

A.2.3.1 Background

"In 1985, DOE published a report in response to Section 8 of the Nuclear Waste Policy Act (of 1982) that required the Secretary of Energy to recommend to the President whether defense high-level radioactive waste should be disposed of in a geologic repository along with commercial spent nuclear fuel. That report, *An Evaluation of Commercial Repository Capacity for the Disposal of Defense High-Level Waste* (DOE 1985, all), provided the basis, in part, for the President's determination that defense high-level radioactive waste should be disposed of in a geologic repository. Given that determination, DOE decided to allocate 10 percent of the capacity of the first repository for the disposal of DOE spent nuclear fuel (2,333 MTHM) and high-level radioactive waste (4,667 MTHM) (Dreyfuss 1995, all; Lytle 1995, all)."

Historical Method.

"Based on commercial high-level radioactive waste containing 2.3 MTHM per canister (heavy metal has not been removed from commercial waste) and defense high-level radioactive waste estimated to contain approximately 22 percent of the radioactivity of a canister of commercial high-level radioactive waste, defense high-level radioactive waste was estimated to contain the equivalent of 0.5 MTHM per canister. Since 1985, DOE has used this 0.5 MTHM equivalence per canister of defense high-level radioactive waste in its consideration of the potential impacts of the disposal of defense high-level radioactive waste, including the analysis presented in this EIS. With this method, less than 50 percent of the total inventory of high-level radioactive waste could be disposed of in the repository within the 4,667 MTHM allocation for high-level radioactive waste."

GENERAL COMMENTS

The Yakama Nation is a sovereign government with federally recognized possessory and usage rights to other lands outside of the reservation's boundaries. These possessory and usage rights arise from inherent rights recognized in the Treaty of 1855 with the United States government (12 Stat. 951.) The Yakama Nation was not granted rights in 12 Stat. 951; however, the Yakama Nation granted certain rights to the United States in the Treaty, including rights to land which now comprise approximately one-quarter of present day Washington State.[1]

The Yakama Nation contributed to the parent language of the Nuclear Waste Policy Act, and was subsequently recognized by the Secretary of Interior as an "affected Indian Tribe" pursuant to the NWPA with regard to site characterization activities on Yakama ceded land at the Hanford site.

The comments of the Yakama Nation with regard to the Yucca Mountain Preliminary Site Suitability Evaluation primarily concern Congressional intent with regard to implementation of the Nuclear Waste Policy Act. Numerous governmental and non-

[1] In Minnesota et al Petitioners v. Mille Lacs Band of Chippewa Indians et al., Supreme Court of the United States, No. 97-1337, On Writ of Certiorari to the United States Court of Appeals for the Eighth Circuit, March 24, 1999, the court held that (page 20) "We conclude that President Taylor's 1850 Executive Order was ineffective to terminate Chippewa usufructuary rights under the 1837 Treaty. The State has pointed to no statutory or constitutional authority for the President's removal order, and the Executive Order, embodying as it did one coherent policy, is inseverable." Further, (page 20, footnote 5) "The Chief Justice disagrees with this conclusion primarily because he understands the removal order to be a mechanism for enforcing the revocation of usufructuary rights. Post, at 6-7. The implicit premise of this argument is that the President had the inherent power to order the removal of the Chippewa from public lands; this premise is flawed. The Chippewa were on the land long before the United States acquired title to it. The 1837 Treaty does not speak to the right of the United States to order them off the land upon acquisition of title, and in fact, the usufructuary rights guaranteed by the Treaty presumed that the Chippewa would continue to be on the land.

governmental parties will address in detail the technical merits and/or deficiencies of Yucca Mountain as a proposed site for deep geologic disposal of commercial spent fuel (SNF) and high-level radioactive waste (HLW).

The Yakama Nation shares the concern of a number of analysts who point out that the key attribute for a favorable repository site, i.e., a dry unsaturated zone, no longer appears to be favorable at the Yucca Mountain site. In fact, the increased reliance of the U.S. Department of Energy (DOE) on engineered barriers for long term isolation of waste at Yucca Mountain, including titanium drip shields over waste packages, is clear evidence of this less than ideal geologic setting.

The primary concern of the Yakama Nation, however, is whether the intent of Congress is being fulfilled for *any proposed repository*. It is clear from Section 111 of the NWPA that Congress had in mind a detailed, well defined risk reduction strategy for the nation's spent nuclear fuel and high-level radioactive waste. Again, Sec. 111(a)(7) states that

> "high-level radioactive waste and spent nuclear fuel have become major subjects of public concern, and ***appropriate precautions may be taken to ensure that such waste and spent fuel do not adversely affect the public health and safety and the environment for this or future generations***." (Emphasis added.)

The agency responsible for licensing any repository under the NWPA, the Nuclear Regulatory Commission, has embarked on a major effort to systematically address risk assessment and incorporate such analysis in its regulatory framework. SECY-99-100, "Framework for Risk-informed Regulation in the Office of Nuclear Materials Safety and Safeguards," discusses the background and considerations behind risk-informing the activities of the Office of Nuclear Materials Safety and Safeguards (NMSS), as well as defining a framework for doing so. The framework itself consists of four parts:

1) definition of different regulatory application areas,
2) evaluation of current regulatory considerations underlying each application area,
3) evaluation of new risk considerations for proposed regulatory actions,
4) integration of 2) and 3).

A concern with regard to risk management and risk reduction pertaining to the Yucca Mountain site involves not only the technical suitability of the geologic medium and impacts to human and ecological receptors from a potential repository, but also ***minimizing risks posed by SNF and HLW to the public safety prior to emplacement in a repository, as well as ensuring that all SNF and HLW is emplaced in a repository.*** Congress contemplated the risks posed by these waste forms, and concluded that the only safe method for their ultimate disposal was deep geologic burial.

Sec. 111(a)(5) of the NWPA states that

> "the generators and owners of high-level radioactive waste and spent nuclear fuel have the primary responsibility to provide for, and the responsibility to pay the

costs of, the interim storage of such waste and spent fuel until such waste and spent fuel is accepted by the Secretary of Energy in accordance with the provisions of this Act."

It is clear that Congress intended that generators and owners of HLW and SNF have the primary responsibility to provide for the ***safe*** interim storage of such waste until such waste is accepted. For commercial SNF, the Nuclear Regulatory Commission is charged with ensuring safe interim storage.

SUBTITLE B – INTERIM STORAGE PROGRAM, Sec. 132 of the NWPA states

"The Secretary, the Commission, and other authorized Federal officials shall each take such actions as such official considers necessary to encourage and expedite the effective use of available storage and necessary additional storage, at the site of each civilian nuclear power reactor consistent with –

(1) the protection of the public health and safety, and the environment;
(2) economic considerations;
(3) continued operation of such reactor;
(4) any applicable provisions of law; and
(5) the views of the population surrounding such reactor."

SUBTITLE C – MONITORED RETRIEVABLE STORAGE, Sec. 141(a) of the NWPA states

"Findings. – The Congress finds that –

(1) long-term storage of high-level radioactive waste or spent nuclear fuel in monitored retrievable storage facilities is an option for providing safe and reliable management of such waste or spent fuel;"

The clear intent of Congress is therefore not only to ensure permanent and safe isolation of SNF and HLW, but also to ensure the safe interim storage of such waste.

Since the NWPA was enacted, DOE has not taken appropriate precautions to ensure that HLW and SNF do not adversely affect the public health and safety and the environment for this or future generations. In fact, DOE has undertaken a number of actions which impede such risk reduction or make it more costly, in particular with respect to defense HLW and defense SNF.

In order to fulfill Congressional intent in implementing the NWPA, evaluation of Yucca Mountain must account for all measures which may be taken to reduce risk of SNF and HLW to humans and the environment, including evaluation of risk posed by SNF and HLW during storage, treatment, and disposal. Decisions concerning final waste form and packaging affect waste volume for SNF and HLW. Decisions concerning repository thermal loading affect repository capacity for defense HLW relative to commercial SNF. Decisions concerning allocation of repository capacity for defense HLW relative to commercial SNF affect treatment plans for HLW.

COMMENTS REGARDING HANFORD SITE WASTE AS RELATED TO THE YUCCA MOUNTAIN SITE

According to DOE, more than 65% of the nation's HLW canisters destined for a repository will originate at the Hanford site.[2] The waste to fill those Hanford canisters would originate from some 53 million gallons of defense HLW currently stored in underground tanks, many leaking, located on Yakama ceded land. DOE has made a decision to allocate a limited capacity in the Yucca Mountain repository for defense HLW disposal.[3] This decision eliminates the potential for disposal of all Hanford HLW in the repository, even assuming that none of the nation's additional HLW inventory is disposed of in the repository.

Of specific concern is that DOE's arbitrary HLW allocation decision (6.66 % of repository capacity) is apparently driving a multi-billion dollar waste treatment program at Hanford (and at other sites) with the aim of treating, 'reclassifying', and disposing of HLW in the near surface environment.

The fraction of Hanford's 53 million gallons of HLW which DOE plans to treat, 'reclassify', and dispose of at Hanford in near surface trenches is currently unknown. Current indications are that a volume 10 times or greater of 'reclassified' HLW would be disposed of at Hanford compared to the volume disposed of in a repository. There are no indications that such a treatment and reclassification plan would comply with the NWPA; in fact, a pending lawsuit addresses this matter (Natural Resources Defense Council, Inc., and Snake River Alliance v. DOE.)

The YN retains perpetual rights on open and unclaimed land within the boundaries of the territory ceded to the United States government in the Treaty of 1855. The Hanford site is located on YN ceded land. Due to the Hanford site's proximity to the Yakama Nation Reservation, the YN is affected by Hanford activities on its Reservation land as well as from impacts to the Hanford ceded land. In addition, the Hanford site creates off-site impacts which affect YN reserved rights on other areas of its ceded territory, including the Columbia River.

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[2] Of some 22,147 HLW canisters planned for disposal at Yucca Mountain, 14,500 would originate from the Hanford Site. Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, Volume II, Appendixes A through L, U.S. Department of Energy, Office of Civilian Radioactive Waste Management, DOE/EIS-0250D, July 1999, pp. A-36-37.

[3] Dreyfus, D.A., 1995, "Proposed Mix of DOE-Owned High Level Waste and Spent Nuclear Fuel," interoffice memorandum to J.E. Lytle (Office of Environmental Management), November 9, Office of Civilian Radioactive Waste Management, U.S. Department of Energy, Washington, D.C. [MOL.19990319.0341]; Lytle, J.E., 1995, "Disposal of DOE-owned High Level Waste and Spent Nuclear Fuel," interoffice memorandum to D.A. Dreyfus (Office of Civilian Radioactive Waste Management), Office of Environmental Management, U.S. Department of Energy, Washington, D.C. [HQO.19951116.0015]

The greatest inventory of HLW and DOE SNF in the United States is located on Yakama Nation ceded land at the DOE's Hanford site. Most Hanford HLW is stored in leaking underground tanks, but some HLW has now contaminated the vadose zone under the tanks, and some has reached the unconfined aquifer which flows into the Columbia River. This HLW poses acute as well as chronic risks to human health and the environment, resulting from its mobility into the environment, its extreme toxicity, and its long-lived activity. DOE SNF at Hanford is considered an acute risk as well, resulting from the degraded nature of containment, and the potential for a catastrophic release to the Columbia River. It is therefore of the greatest importance to the YN government that DOE and the United States fully consider any actions with regard to retrieval, processing and disposal of this HLW and SNF which may affect the perpetual Treaty rights of the Yakama Nation.

The human health and environmental risks posed by Hanford HLW are significantly greater than those posed by commercial SNF; that risk may increase substantially as the Hanford HLW tanks continue to deteriorate and fail, and unless the Hanford SNF is stabilized and isolated from the environment. In order to fulfill the mandate and intent of Congress in the NWPA, an analysis of the risks of interim storage, treatment and disposal of DOE HLW and SNF relative to those of commercial SNF should be conducted. This analysis is necessary before DOE, Congress, and affected governments including the YN may have confidence in the SNF and HLW disposal program.

When such an analysis is conducted, it should fully account for the distinct pathways and risks posed to Native Americans, including YN Tribal members. (Please reference "Estimation of Health Risk Based on Revised Estimates of HEDR Doses for Maximum Representative Individuals Consuming Fish and Waterfowl from the Columbia River: An Evaluation of HEDR Reports on the Columbia River Pathway", Agency for Toxic Substances and Disease Registry, Atlanta, Georgia, March, 1998.)

The following factors should be considered in a risk reduction analysis for HLW and SNF storage, treatment, and disposal.

1) Hanford HLW exists in an extremely hazardous form. It consists of sludge, saltcake and liquids which are unstable and have numerous constituents which have reacted to form flammable gasses and potentially explosive compounds. While extensive work has been undertaken over the past decade to assess and mitigate the risks posed by potential explosions in the Hanford HLW tanks, the reality is that characterization data does not exist at the level necessary to ensure that an explosion may be ruled out. DOE Hanford SNF is stored in a leaking basin which could fail during an earthquake, and the SNF elements have corroded and released HLW sludge to the basin floor. Commercial SNF, by comparison, is in the form of a solid with well defined characteristics, has more robust cladding, and is stored under stringent standards.

2) Hanford HLW has been released to the environment, and containment continues to fail. Once radioactive materials are present in the accessible environment, the risks posed to human health and the environment increases dramatically. Not only has

Hanford HLW already impacted the accessible environment, but it is certain that those impacts will increase in the near term. Hanford HLW has reached the vadose zone, and HLW constituents have reached groundwater in some locations. Similar to the lack of characterization data, data on the extent of HLW contamination to the vadose zone and groundwater is incomplete. DOE Hanford SNF has released radionuclides into the soil from leaks in the basin. Commercial SNF remains contained and isolated from the accessible environment.

3) Hanford HLW is likely to produce unforeseen and unpredictable risks in its interactions with the environment. Unlike commercial SNF, which exists in a well characterized and stable form, Hanford HLW constituents (sludge, saltcake, and liquids comprised of organic, inorganic and heavy metal radionuclides and chemical wastes) present significant risk assessment challenges. In short, Hanford HLW poses greater risk relative to commercial SNF once released to the environment by virtue of its composition. Similarly, DOE Hanford SNF exists in a form which is more difficult to retrieve from the environment than commercial SNF.

SPECIFIC COMMENTS

Section 2.2 BASIC SAFETY ASSESSMENT APPROACH
pg. 2.2

"The two basic elements of any safety assessment are event identification and consequence analysis. The first element involves performing a systematic review of relevant site and facility features and processes in order to define the type of events that can occur. Events identified include the full range of probable events, from normal operational events, that might be anticipated to occur to very low-probability events. Events are identified by first evaluating potential hazards applicable to the site and facility design, then developing a detailed site-specific and design-specific event scenario, in which event sequences are defined and the anticipated frequency of occurrence of event sequences is established."

Comment

The basic safety assessment approach is a form of risk assessment. At the Hanford site, where most of the nation's HLW is stored in leaking underground tanks, such risk assessments have been applied with respect to 1) lower probability/higher consequence events such as tank explosions, and 2) higher probability/lower consequence events such as continued breaches of tank containment and release of HLW to the vadose zone and groundwater. It should be noted that "lower consequence" in the case is relative, and that in the case of environmental releases of HLW, the consequence is simply delayed until such time as HLW reaches the biosphere.

Section 2.3.3.4 Category 2 Design Basis Event Consequences
pg. 2.33

"*Design Basis Event Frequency and Dose Calculation for Site Recommendation* (CRWMS M&O 2000p) evaluated the consequences of Category 2 design basis events. Offsite radiation doses (uncontrolled areas) for bounding Category 2 design basis events were based on the following (CRWMS M&O 2000p, Section 6.1.2):

- Inhalation and air immersion pathways.
- Release fractions that take into account the respirable fraction of radionuclide particulates.
- Mitigation by high-efficiency particulate air filters of particulate releases from surface facilities.
- For calculating the atmospheric emissions from repository surface facilities, the distance to the receptor was 11 km (7 mi), the closest distance from the repository surface facilities to the assumed site boundary. The ventilation exhaust locations for the subsurface areas of the repository are located about 3 km (2 mi) closer to the assumed site boundary than the repository surface facilities. Therefore, for atmospheric emissions from the ventilation exhaust locations for the subsurface areas of the repository, the distance to the receptor was 8 km (5 mi) (CRWMS M&O 2000p, Section 3.3).
- 99.5 percent ground-level atmospheric dispersion factor (BSC 2001a, Section 5.3.5.3)."

Comment

The Summary of Preclosure Category 2 Design Basis Event Radiation Doses for the Public includes an evaluation of possible accidents while transferring spent fuel into disposal packages, and their consequences for radiation doses to the public.

A more comprehensive evaluation is needed, with equivalent detail, of the predicted consequences for scenarios which bound DOE decision alternatives for disposal of the nation's HLW and SNF, including storage, treatment, and disposal alternatives, particularly with respect to whether any alternatives may increase site specific risks or overall system risks.

Section 3.1 PRELIMINARY POSTCLOSURE SUITABILITY EVALUATION METHOD—CONFORMANCE WITH PROPOSED 10 CFR 963.16(a)(1) and (2) pg. 3.2

"The proposed DOE regulation, 10 CFR Part 963 (64 FR 67054), requires that the TSPA method be used to evaluate whether a repository at Yucca Mountain would be likely to meet the EPA radiation protection standards and proposed NRC regulations. Because the final and proposed regulations prescribe a compliance period of 10,000 years, the performance attributes of the potential geologic repository must be evaluated using sophisticated computer simulation models."

Comment

In order to fulfill the letter and intent of the Nuclear Waste Policy Act, a genuine Total System Performance Assessment (TSPA) is required. Such an assessment would evaluate nationwide risks for storage, treatment, and disposal alternatives for SNF and HLW. The current DOE TSPA for Yucca Mountain artificially compartmentalizes the overall decision process necessary to implement the NWPA, by failing to account for the impact of DOE decisions regarding, for instance, allocation of capacity within the repository for commercial SNF versus defense HLW.

A comprehensive TSPA should be undertaken for the nation's entire inventory of SNF and HLW, incorporating risk assessment for storage, treatment, and disposal alternatives. Regulatory dose and concentration limits should be applied consistently for the entire system. In order to be protective of Native Americans and to comply with Treaty rights, computer models which inform regulatory dose and concentration limits must account for specific Native American lifestyle and dietary factors.