Sustainable Fuel Cycle
TASK FORCE
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Sustainable Fuel Cycle Task Force Science Panel

January 2, 2013

Dr. Keith McConnell
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Dear Dr. McConnell,

The Science Panel of the Sustainable Fuel Cycle Task Force appreciates the opportunity to provide comments for the NRC staffs' scoping process for an Environmental Impact Statement (EIS) to support rulemaking to update the Commission's Waste Confidence decision. We recognize that this is a difficult task for the NRC staff and that it is made even more difficult by the ambitious schedule.

As scientists who have worked for many decades to provide a scientifically sound approach for safely managing and disposing of our nation's used nuclear fuel and high level radioactive wastes, we urge the staff to use this process to articulate more fully the importance of developing a passive geologic repository capability in a timely fashion within the next decade. We strongly recommend that the EIS process comprehensively address the significant technical and institutional uncertainties and consequences caused by this nation's indefinite deferral of the development of functional disposal capacity for high level radioactive wastes. This country has been producing high level radioactive wastes from reactors for more than fifty years without overcoming the socio/political obstacles, such as those that have recently stopped progress on the Yucca Mountain geologic repository. To meet our needs for clean affordable energy, we need continued nuclear electric power; however we must also overcome these continuing socio/political obstacles to provide timely waste disposal capacity. We must act responsibly now to provide a real disposal capacity and not just pass the consequences of inaction on to future generations.

The Blue Ribbon Commission on America's Nuclear Future (BRC) report confirmed that there is no known alternative to geologic disposal, that current law establishes Yucca Mountain as the site for the first U.S. repository, and that prompt efforts are needed to develop a geologic disposal facility. Although we understand this Administration does not wish to pursue the Yucca Mountain facility for political/policy reasons, this posture of inaction does not relieve the NRC of the task of evaluating the consequences of Federal inaction and the national need for a permanent passive disposal solution. . This entire situation would have been far better served had a Programmatic EIS been developed by the DOE, which should have been issued before DOE moved to withdraw its statutorily required Yucca Mountain License Application. Such a PEIS would have also properly addressed long-neglected matter of a second repository. Unfortunately, the NRC, the independent regulatory agency in repository development, is now faced with addressing environmental impacts that have arisen from political desires and not from a thoroughly reasoned major federal action.

The NRC has a National Environmental Policy Act (NEPA) responsibility to consider the lasting environmental impacts of its regulatory actions, including those that permit the continued operation and expansion of nuclear energy production. We support the need for this energy source, but we also strongly believe, as the BRC also states, that this generation must produce a disposal solution in parallel. It is inappropriate and unethical to just put the used nuclear fuel/ high level radioactive waste in indefinite engineered storage for hundreds of years, without having a meaningful passive waste disposal solution. Specifically we recommend that the EIS address:

- The EIS process must realistically consider that nuclear utilities are currently loading large (over 15 MTU of used nuclear fuel) canisters with used nuclear fuel that will have to be received "as is" in whatever disposition facility that is developed (consolidated interim storage or direct disposal). There are several specific concerns related to this situation.
    - As time progresses a growing number of reactors will have decommissioned and demolished their used fuel handling buildings. As more power reactors reach the end of their useful lives the number of stranded large loaded canisters will increase substantially. There are currently over 1.500 canisters at reactors and approximately 150 new ones are created each year. Even if a repository were to be developed in the next 25 years, there would be approximately 5,000 of these canisters of spent fuel located at 73 sites across this country, mostly on our rivers, lakes, and seashores.
    - It is likely that these large storage canisters used would have been compatible with disposal via ramps, as in a repository at Yucca Mountain; however there is no certainty that a different repository, which may require entry via shafts, would be able to handle such large containers. The ability to emplace such large canisters for disposal and the limitations on thermal loading for different rock or engineered barrier systems could result in the need for repackaging the stored wastes into smaller containers. Given the physical size (well over 100 tons) of these large canister packages, it is likely that the packages may have to be transferred into the repository emplacement area by ramps. This could rule out some geologic settings e.g. deep salt formations, where ramp access may be impracticable. Also the higher thermal output of the large packages may result in higher near field environmental temperatures which could adversely impact the ability of the geologic media to retard radionuclides, e.g. clays. Although such emplacement and retardation evaluations will be difficult given currently available information, such aspects must be quantitatively addressed in the EIS.
    - The EIS has to consider repository sites that may not be able to accommodate these large packages and thus must evaluate environmental impacts of opening and repackaging the spent fuel. This includes the impacts of costs, occupational radiation exposures, and other risks from repackaging these canisters at some unknown location. Such repackaging operations are not possible at decommissioned reactors because their nuclear fuel handling

Facilities, which may have previously been able to perform such operations, have been or will be demolished.

- There is uncertainty with the long-term integrity of modern high burn-up (>45Gw-days/MTU) fuel cladding after extended dry storage and subsequent transportation. It is possible that dry storage canisters, which would be shipped to a repository many years from now, could contain damaged fuel rods in an uncertain and perhaps unpredictable condition and configuration. It is very possible that the cladding may no longer function as an effective fission product barrier when it is received at the repository site. The environmental impact of this uncertainty in fuel condition has to be evaluated in both the post-closure and pre-closure periods of any future repository scenario.

  For the repository post-closure periods, the EIS should evaluate the environmental impacts due to the potential loss of cladding as a barrier to the release of radioactive isotopes into the repository setting.

  For the repository pre-closure period, the EIS should evaluate the environmental impacts from the possible repackaging of spent fuel canisters that could now contain failed fuel. This unloading and repackaging at the repository surface facility can be done, but only with: 1) the design and construction of a substantial repackaging facility; 2) greater occupational exposure to the repository workforce; 3) management of additional solid, liquid, and gaseous waste streams associated with the spent fuel re-packaging facility; and, 4) substantial costs that would have been far less likely had the Yucca Mountain program been able to proceed.

- **The EIS should fully consider the technical and safety issues associated with long-term dry storage: cladding deterioration, containment seal and boundary integrity, concrete deterioration, the ability to convincingly demonstrate compliance with transportation safety requirements after extended periods of on-site storage.** A more complete development of these and other relevant technical issues is contained in the Nuclear Waste Technical Review Board report, *Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel,* December 2010.

- A complete articulation of the societal uncertainties of the allocations of future resources to dispose of existing and NRC authorized waste generation must be included. We believe there are substantial uncertainties in what future generations may do, or will be able to do, to deal appropriately with wastes that were left to them in a non-passive state. **To our knowledge, traditional EIS efforts have not depended upon society far into the future to take active corrective or continued maintenance actions to mitigate potential adverse environmental consequences from wastes that they did not make.**

We realize that it will be a challenge for the NRC staff to address such societal uncertainties in an EIS, but we consider this assessment necessary based on the current Administration's posture

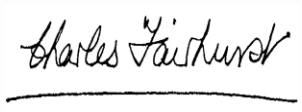
toward inaction. What rationale is there that future generations will be better able (and willing) to deal with the technical, security, economic, and political aspects of the existing wastes than we are? As difficult as it may be, this task has to be addressed by the NRC staff in this EIS in a quantifiable manner.

We do not believe it is ethically appropriate to assume that future generations will want to spend their resources to indefinitely maintain and protect nuclear wastes that we generated for our benefit and not theirs. Thus we believe the EIS should not assume that future generations will continue, at their expense, to care for our wastes past 100 years in the future. This applies certainly to existing reactor sites and also to any central storage site as well, because all engineered storage sites requires constant maintenance and security activities. **The environmental impacts of the possible abandonment of engineered storage systems in the post 100 year period (2100 on) needs to be quantified and compared to a timely repository case as was done in the DOE Yucca Mountain FEIS and which was adopted by the NRC staff as a part of its review of the Yucca Mountain License Application.**

These are important examples of the types of issues that must be considered in the EIS. We wish that the nation would move forward with the Yucca Mountain process as defined by the current law, so that this additional EIS effort would not be necessary. The relevance of the existing law is acknowledged not only in lawsuits currently being litigated, but in the Blue Ribbon Commission report itself. Implementation of the current law is a sufficient basis for the NRC's Waste Confidence. If this Administration continues to refuse to proceed with Yucca Mountain, a new geologic repository program has to be created to move ahead strongly, deliberately, and promptly to develop another geologic repository site. This EIS must address the substantial and real consequences of political inaction. As even this Administration has admitted, there is nothing scientifically wrong with the Yucca Mountain repository site. Politics is the problem and this EIS needs to clearly articulate the price that our society has to pay when politics trumps science. The NRC staff should also explore methods by which our Nation's waste management practices can be freed from the yoke of political meddling. If such an explanation is not forthcoming, future history may be doomed to repeat itself, as our country tries to develop either a Central Interim Storage Facility or different repository site. We recognize that the NRC has been put in this difficult situation by this Administration's political position; however the NRC must perform its NEPA responsibilities and examine the significant long term environmental consequences caused by politically motivated inaction.

We look forward to assisting the NRC staff in any way we can.

Yours sincerely,



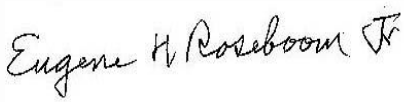
Charles Fairhurst, Ph.D.

D. Warner North Ph.D.

Ruth Weiner, Ph.D.

Isaac Winograd, Ph.D.

Wendell Weart, Ph.D.



Eugene H. Roseboom Jr., Ph.D.