OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

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March 13, 2008

The Honorable Dale E. Klein
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: RECENT ACNW LETTERS ON YUCCA MOUNTAIN WASTE PACKAGE AND DRIP SHIELD CORROSION AND POSTCLOSURE DEGRADATION OF EMPLACEMENT DRIFTS

Dear Chairman Klein:

You recently received two letters from the Advisory Committee on Nuclear Waste and Materials: one on Yucca Mountain waste package corrosion and the other on drift degradation. You should be aware that both letters suffer from an overly narrow technical perspective—perhaps because the Committee lacks expertise in these areas—with the result that the Committee's conclusions are largely irrelevant.

The chief problem affecting the discussion on both subjects is that the Committee throughout assumes that drip shields will be in place to cover the emplaced waste packages. As you know, the Energy Department's plans for installing drip shields are tenuous, at best and projected installation is far in the future. It is such a doubtful proposition that drip shields will actually ever be installed that the NRC cannot reasonably assume for the purpose of licensing that drip shields would be in place to protect waste packages. A Committee member did ask at one point during the corrosion briefing what would happen if there were no drip shield, but got no answer and the Committee did not raise the matter again.

The problem of narrow focus and superficiality affects both Committee letters, but in the following I will concentrate on the corrosion letter. The Committee bases its report on briefings it received but presents an even rosier picture than it received. For example, the NRC staff briefer stated:

> It is very difficult to predict the stability, persistence of passive film in such a long period of time.

You do not get the sense of this uncertainty in the Committee's letter, or that there is a lack of data on Alloy 22, which leads to reliance on experience with related alloys including those used in nuclear power plant steam generators. If we have learned anything from the history of steam generator corrosion, it is that there are many surprises when conditions change, and that one cannot rely on arguments based on lab tests without full-scale testing under service conditions. Yet the Committee happily swallows such arguments whenever they lead to conclusions that corrosion will be inhibited. For example,

> Current information from experiments indicates that crevice corrosion by dust deliquescence does not affect waste package performance significantly, because the surface tension of the deliquescent droplets can reduce the amount of brine that contacts a metal surface.

I can only say that is a very thin reed on which to balance a "no corrosion" argument. The Committee similarly also accepts that localized corrosion would produce only a "tight crack or a tiny pit. So it really doesn't open the surface," and that nitrate solutions inhibit localized corrosion.

The Committee reports the Staff's fundamental risk insights have not substantially changed since 2004. The Committee drops the qualification that this was based on the Staff's thinking that localized corrosion would only create small openings that would restrict the leakage of radioactive materials to the environment. When asked about the constancy of its "fundamental risk insights" the Staff briefer quickly qualified it by saying " that statement isn't being made in a global sense for everything"

Preliminary information from Nevada's experiments point to an entirely different conclusion—that dripping can occur from the drift ceiling during the initial thermal pulse and that the evaporation of such dripping on the waste packages can produce Davis-Besse type crusts under which localized corrosion would take place. Extensively pitted surfaces would, even if the individual pits were small, produce sufficient openings for water flow into the packages and radioactive flow out. Moreover, this would take place in the first thousand years or so, with the consequences, as compared with a later release, that the release would be more radioactive and the relevant protection standard would be 15 millirem per year. Whether or not the Committee agreed with this, it should have made the Commission aware of the full range of technical possibilities.

As you have already decided to terminate the Committee we have no further recommendations for improving its operation. However, the tendency to view DOE's submissions through rose colored glasses is not limited to the Committee; it runs throughout the NRC, and it is something you will have to address if there is to be a fair and thorough review and hearing on protecting the public health and safety.

Sincerely,

Robert R. Loux
Executive Director

cc: Commissioner Lyons
Commissioner Jaczko
ACNW
Nevada Congressional Delegation