



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUL 5 1979

R. Doughty

MEMORANDUM FOR: Dale Smith, Chief, Low Level Waste Management Licensing
Branch, NMSS

FROM: Lake Barrett, Section Leader, Environmental Evaluation
Branch, DOR

THRU: George Knighton, Chief, Environmental Evaluation Branch, *SNB*
DOR

SUBJECT: COMMENTS ON BROOKHAVEN'S SOLIDIFICATION RATIONALE

Your memorandum dated June 26, 1979 requested my comments on the Brookhaven Report entitled "Development of Free Standing Water (FSW) Criteria and Rationale For Requiring the Solidification of Ion Exchange Resins and Sludges (June 19, 1979)."

First of all, I'm gratified to see action being taken to set criteria to assure integrity of low level waste burial sites. The subject papers are steps in the right direction; however, I believe that much more technical work and value-impact analyses including alternatives, besides the BNL report, would be necessary before the NRC implements any low level waste burial standards that may have serious economic impacts on power costs or availability to the public. The BNL papers only discuss the state of the art in a method of solidification, only qualitatively discusses their effect on burial site integrity and recognizes need for economic consideration. Certainly the papers do not provide any technical and economic evaluation necessary to establish a "backfittable" waste criteria.

The issue is one of adequate burial site integrity. First, one has to determine if burial site integrity is adequate with the wastes presently being disposed of. If the answer to this is no the task becomes one of improving site integrity. Several alternatives exist besides looking at the waste characteristics, e.g., concrete-line the trenches. Assuming improvements to the site are not desirable, the waste characteristics can be examined. One alternative is to put the waste in a better package to improve isolation. This approach is mentioned by BNL but not examined. Improved burial conditions, e.g., concrete casks, can provide a high degree of isolation of the buried waste. In my opinion, better containers would provide much better waste isolation with lower economic impact than improved solidification techniques.

Waste characteristics can be examined assuming improved containers do not provide adequate isolation. Simple solidification without free water does not answer all burial site integrity problems. The type of solidification may be by far the most important consideration. For example, very low activity wastes solidified with urea formaldehyde (UF) may have an adverse effect on burial site integrity when one

Contact: L. Barrett, EEB/DOR
28066

8211240126 790706
PDR ADOCK 05000239
P PDR

Dale Smith

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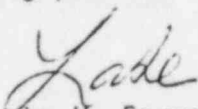
considers that corrosive, strong acids may leach out and attack an adjacent container which may contain higher activity waste, thus, creating a burial site condition worse than if the initial very low activity waste had not been solidified with UF. This and other similar problems, e.g., leachability, vibration, biodegradation, are superficially discussed by BNL but their recommendations do not address these issues.

The recommendations presented by BNL for the FSW criteria appear reasonable, even though the basis is extremely weak. The BNL reference to the DOT regulations is not clear. It should be noted that the DOT leachability limits only apply to Low Level Solids (LLS) and not Low Specific Activity (LSA) transportation classifications. Power reactor wastes are normally shipped as LSA, not LLS, so the leachability requirements do not apply. No mention is made as to how FSW measurements in the range of 0.2-0.5% could be made.

One area that should be addressed further is chemical wastes which may contain chemicals like chelating agents. It would appear that these types of wastes should have a greater degree of isolation than normal solidified liquid wastes. There is no mention of this in the papers.

The recommendations presented by BNL for the rationale for requiring the solidification of ion exchange resins and sludges does not appear justified for backfitting based upon the information presented. As discussed earlier, a value impact assessment including alternatives needs to be prepared. Additionally, I think consideration should be given to the activity level of the wastes. Higher activity resins or sludges could require the addition of a solidification agent whereas lower concentration wastes would not. This type of approach would most likely provide a maximum increase in burial site integrity with the lowest adverse impact. It would also eliminate the need to consider solidification of other low activity non-free-standing materials, e.g., spent charcoal filters, contaminated dirt and trash.

Any recommendations regarding waste criteria must be well thought-out. This should include more than just the requirement to solidify. UF is the easiest type of solidification system to backfit at power reactors. The effect of UF on the burial sites which presently receive dewatered resins may not increase burial site integrity but could decrease it when considering all factors. You must be careful in your position not to jump out of the frying pan and into the fire.


Lake H. Barrett, Section Leader
Environmental Evaluation Branch
Division of Operating Reactors

cc: (see page 3)

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Dale Smith

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cc: J. Miller
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REMARKS

My comments on Colombo and Neilson's FSW and solidification rationale are attached. Please review. I've made some statements about RETS solidification requirements that you might wish to revise. If I can get your comments and those of the others at TMI on 7/9/79, I'll incorporate them all into one memo, if you like.

Barnett's comments are also attached. I think they are very good.

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