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UNITED STATES
NUCLEAR REGULATORY COMMISSION
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MEMORANDUM FOR: Enrico F. Conti, Chief
Waste Management Branch
Division of Radiation Programs
and Earth Sciences

FROM: Michael B. McNeil
Waste Technology Section
Waste Management Branch
Division of Radiation Programs
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SUBJECT: WELDMENTS IN HLW CONTAINERS

The staff of the Manufacturing Science Coporation (MSC) and their subcontractors at the Colorado School of Mines (CSM) have reviewed carefully the issues involved in welding HLW containers and what can be learned about DOE intentions in this area and briefed me on potential issues. One point emerged of which you should be aware, in regard to fabrication of the unfilled container.

DOE is considering both cast containers [to be welded closed after being filled with waste] and containers fabricated from plate, which will be welded into shape before being filled. This memorandum addresses regulatory issues raised by DOE's possible use containers formed and welded from plate.

The MSC staff feel that in the case of plate-formed containers it is possible that DOE will ask NRC to agree to a standard welding procedure, and to agree that containers made by this procedure will be acceptable provided that they pass certain nondestructive evaluation procedures. They and their subcontractors at CSM feel that we should not agree to such a proposal if it is made. They feel that in order to mimimize infant mortality NRC ought to hold DOE to a weld chemistry and weld microstructure specification and require sections to be cut from randomly chosen containers and studied chemically and metallographically. This study might be nondestructive in the sense that containers could be repaired if found to pass.

I am convinced that our contractor is correct in this respect, though I do not know whether NRC should address this through a regulatory action before licensing or merely advise DOE that we expect chemistry and microstructure specs to be included in the license application. I think this question deserves some attention.

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The question of how to determine the soundness of the final weld (made when the containers are full of hot waste or spent fuel) is a very difficult one. Our contractors feel that NDE may have to be supplemented by careful monitoring of the weld process itself; perhaps by monitoring the noise level (both acoustic and electrical) it will be possible to supplement the NDE evaluation useful.

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cc: H. Miller, NMSS
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