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**URANYL NITRATE HEXAHYDRATE PROCESSING AT THE FERNALD  
ENVIRONMENTAL MANAGEMENT PROJECT**

01/23/95

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LETTER



**Department of Energy**  
**Fernald Environmental Management Project**  
 P. O. Box 538705  
 Cincinnati, Ohio 45253-8705  
 (513) 648-3155

**JAN 23 1995**

DOE-0459-95

Mr. James A. Saric, Remedial Project Director  
 U.S. Environmental Protection Agency  
 Region V - 5HRE-8J  
 77 W. Jackson Boulevard  
 Chicago, Illinois 60604-3590

Mr. Tom Schneider, Project Manager  
 Ohio Environmental Protection Agency  
 401 East 5th Street  
 Dayton, Ohio 45402-2911

Dear Mr. Saric and Mr. Schneider:

**URANYL NITRATE HEXAHYDRATE PROCESSING AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT**

Reference: Letter, Dated January 13, 1995, from J. Craig to J. Saric and T. Schneider, "Uranyl Nitrate Hexahydrate Processing at the Fernald Environmental Management Project"

In the above referenced letter the Department of Energy (DOE) informed the U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (OEPA) that the Department of Energy, Fernald Area Office (DOE-FN) would not be able to initiate processing of Uranyl Nitrate Hexahydrate (UNH) on January 17, 1995. During the weekly UNH conference call that was held January 17, 1995, OEPA requested additional information pertaining to the specific reasons why the date was missed.

This letter provides additional information and detail for not commencing neutralization of UNH by the required date. As previously discussed with you, a design review team has been assembled to evaluate the existing UNH transfer and neutralization system design and construction concerns. DOE will provide an updated schedule when a complete review of the design has been completed and a comprehensive schedule has been developed for the UNH Neutralization project.

The following are concerns and problems that have been identified:

## 1. Piping

- a. A portion of the piping was built without secondary containment, which is a requirement of DOE Order 6430.1A, General Design Criteria. DOE had planned to obtain a criteria deviation to use the pipe without secondary containment. Without secondary containment, or the criteria deviation, the piping system cannot be used to transport nuclear materials. The piping affected is stainless steel piping, including the UNH transfer pipe from the NFS tanks to Plant 2/3, the UNH transfer pipe from Hot Raffinate to Plant 2/3, the UNH transfer pipe from OK Liquor to Plant 2/3, and carbon steel piping, including the Magnesium Diurnate (MDU) Slurry pipe from Plant 2/3 to Plant 8, and the Filtrate Pipe from Plant 8 to Plant 2/3. The development of a cracked weld, discussed below, has made it more difficult to justify a criteria deviation for secondary containment.
- b. A cracked weld was discovered in the carbon steel Filtrate Pipe from Plant 8 to Plant 2/3. The weld and another weld in close proximity were found to be substandard. Therefore, there is a major concern that the carbon steel Filtrate pipe and the MDU Slurry pipe may not be suitable for use.
- c. As a result of the cracked and substandard welds in the carbon steel piping, there are concerns pertaining to the stainless steel pipe welds throughout the system. The integrity of the stainless steel pipe welds needs to be verified to ensure the system is suitable for use.

## 2. Pumps

- a. Upon conducting a hydrostatic test upon new progressive cavity pumps, it was determined that the pumps had cracked casings. Double diaphragm pumps available on-site were installed. When the System Operability Test was begun, there were several problems with leaking double diaphragm pumps. The pump manufacturer and the Fernald Environmental Restoration Management Corporation (FERMCO) maintenance assisted with rebuilding the pumps and leaking pumps have not been a problem since mid-December.
- b. In December a concern was raised pertaining to the pump vibrations. To stop the vibrations, the tops of the pumps were restrained. The manufacturer will not endorse this restraint because of the possible development of stress cracks which would result in a release of material.
- c. The manufacturer recommends that the teflon diaphragms used in the pump not be subjected to temperatures below 40° Fahrenheit. During the winter months, the temperature of the UNH in the outdoor UNH tanks will drop below 40° Fahrenheit.

3. Valves

- a. There were problems with 16 defective valves. These valves were subsequently replaced with new valves; however, the defective valves resulted in numerous problems and delays in the System Operability Test.
- b. Three valves associated with pump J-101, were apparently damaged from frozen water during the cold weather in early January prior to reinsulation of the line. These valves were subsequently replaced.

4. Safety Envelope to Ensure Safety Operations

The Final Safety Analysis Report of the UNH Neutralization project has not received final approval. There has been no verification that the safety envelope has been established for the UNH Neutralization project. It is critical to the safety of the personnel and environment that the Final Safety Analysis Report requirement be in place and verified prior to commencing operations.

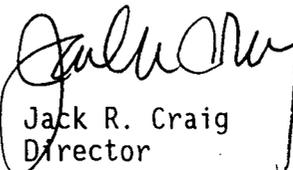
5. Verification of Readiness

- a. The Fernald Environmental Restoration Management Corporation (FERMCO) Operational Readiness Review (ORR) has not been completed to verify that FERMCO is ready to safely proceed with UNH operations.
- b. The DOE ORR has not been conducted to verify that FERMCO is ready to safely proceed and that DOE is ready to oversee operations of the UNH Neutralization project.

The above details indicate DOE concerns as to why commencing the UNH Neutralization project would increase the risk to human safety, health, and the environment. We are attempting to minimize those risks and to minimize this delay by evaluating other possibilities for containment and disposition of the UNH material.

If you have any questions, please contact Chris White at 513-648-3172, or Johnny W. Reising at 513-648-3139.

Sincerely,



Jack R. Craig  
Director

cc:

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