



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

DEC 7 1989

*Docket: 70-0036*

MEMORANDUM FOR: George M. France  
Nuclear Materials Safety and  
Safeguards Branch  
Division of Radiation Safety and  
Safeguards, Region III

FROM: Amar Datta  
Uranium Fuel Section  
Fuel Cycle Safety Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

SUBJECT: INSPECTION OF COMBUSTION ENGINEERING, INC., HEMATITE, MISSOURI  
NOVEMBER 13-17, 1989

My feeder inspection report on fire protection is enclosed for incorporation into your inspection report of the subject facility.

A handwritten signature in cursive script, appearing to read "Amar Datta".

Amar Datta  
Uranium Fuel Section  
Fuel Cycle Safety Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

Enclosure: Inspection Report

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FEEDER INSPECTION REPORT ON  
COMBUSTION ENGINEERING, INC.,  
HEMATITE, MISSOURI  
FIRE PROTECTION

A. ASSESSMENT

The fire protection program of the facility was measured against the requirements of the recently published Branch Technical Position on fire protection, as well as prevalent industry standards, notably the National Fire Protection Association codes. In performing the assessment, the inspector toured all the buildings and the adjacent outdoor storage, materials handling, and equipment areas which house or support licensed activities. Documents were examined for the purpose of assessing the licensee's commitment to the fire protection program and actual performance of its procedures. The assessment methods also included examination of randomly selected portable extinguishers, process equipment, process flow sheets, and past inspection reports of American Nuclear Insurers (ANI). Facility employees and the Fire Chief of the Hematite Volunteer Fire Department were interviewed.

1. The Buildings

The manufacturing activities of the facility are located in five buildings - the Oxide Building, which includes the UF<sub>6</sub> receiving and vaporizing area; the new and the old pelletizing buildings, Buildings 254 and 255 respectively; the Warehouse, which also houses two ammonia dissociating units; and Building 240, which houses the incinerator and scrap recovery area, the quality control laboratory, the maintenance shop, change rooms, and office areas. When the new Building 253 is completed, all six buildings would be one continuous built-up complex, sharing common barrier walls. The steel structures of the buildings are however separate and the floors, walls, and roofs are of noncombustible construction. The buildings are each served by an independent ventilation system. Each building can be isolated by closure of doors, except that the Oxide Building and the adjoining Building 255 have open communication at the ground floor level.

There is no automatic fire suppression system and no fire detector in any of the buildings. The UO<sub>2</sub> powder storage areas in the two pelletizing buildings are not<sup>2</sup> isolated from the pelletizing, dewaxing, and sintering areas. Under these circumstances, combustibles should be held to the absolute minimum. Wooden crates and cardboard boxes should therefore be removed from the open areas as soon as possible upon uncrating the contents. Some such objects were found on one of the mezzanine floors of Building 255. It is noted that offices and storage areas in Building 255 are enclosed in concrete enclosures, which provide reasonable resistance to propagation of fire originating within them.

## 2. Process Fire Safety

Process equipment layouts, including flammable gas generation and control systems, were examined for fire hazards. The ultra-violet flame supervision systems of the new Lindberg dewaxing furnaces and sintering furnaces in Building 254 were tested and found to be functioning. The older furnaces in Building 255, however, do not have flame supervision devices. The inspector expressed concern about the safety of operation of these furnaces in his discussions with the technical staff of the facility. Absence of flame supervision means absence of a safety feature, even if the hydrogen component of the cracked ammonia may continue to burn in its own flame upon loss of the natural gas-fired pilot flame. A careful review of the issue is recommended.

## 3. Fire Protection Systems

The facility is protected by hand-held portable extinguishers and one heavier portable extinguisher on wheels. The extinguishers are of appropriate type and capacity. Documentation showing periodical hydrostatic testing of the extinguishers were reviewed. Upon random examination of several extinguishers, however, it was found that the monthly inspection for October 1989 was missed in all of them. A monthly inspection and sign-off on the hanging tag is required by NFPA 10, Standard for Portable Fire Extinguishers.

The facility has no installed fire water system. It is dependent on the local Hematite Volunteer Fire Department for suppression of anything but small, incipient fires. The offsite fire department must carry the fire suppression water on board their pumper trucks. Concern was expressed in this matter in discussions with the facility staff. The facility has plans for constructing a 200,000-gallon surface reservoir and a dry hydrant for the purpose of sprinkling down potential leakage of ammonia from outdoor storage tanks. The hydrant must be operated by a pumper from the offsite fire department. This arrangement could provide an augmented supply of water in the event of a fire, but a single hydrant would still be inadequate to cover the entire facility. ANI has suggested an underground fire main, tapping on to the Hematite City water system 3/4 mile away, and a requisite number of hydrants and hose cabinets. Other solutions are also possible. Serious consideration of the issue of a fire water system is recommended.

## 4. Pre-Fire Planning

Emergency response planning documents were examined. These include procedures to be followed in the event of a fire emergency. Facility employees are to attempt suppression of small, incipient fires only. The Hematite Volunteer Fire Department is to be called in every instance. The Festus, Missouri Fire Department, about 6 miles away, is also in agreement to come to the aid if necessary. The facility's 17-member fire

brigade holds at least one fire drill and one training session in a year. The April 1988 session consisted only of verbal instruction and viewing of a training film and the March 1989 session of fire extinguisher training. There were no tests administered to gauge the effectiveness of the instruction. A much greater emphasis on hands-on fire fighting training with actual fires with different types of extinguishers is recommended. If at all possible, joint fire drills with participation of the offsite fire department should be held.

The inspector visited the Hematite Volunteer Fire Department and interviewed Mr. Robert Hipes, Fire Chief. Mr. Hipes had visited the facility in the past and appeared to be aware of the special restrictions of fighting a fire in it. The Department possesses two pumper trucks and one water-tender, all maintained in good order.

5. The South Vault

Organic material, such as used HEPA filters and wood, are stored on the floor of this building along with containers of nitric acid. This constitutes a fire hazard should the acid leak. A dike to contain potential acid leak is recommended.

6. Housekeeping

Housekeeping is generally good. Some pieces of wooden crates and cardboard boxes, mentioned above, should be removed from one of the pelletizing buildings.

B. MICRONISER OPERATION

The inspector observed an operator manually feeding a microniser in the Oxide Building through an opening in the hood with presumably scrap oxide powder. At the same time, the powder was belching out of another outlet of the equipment on to the floor of the hood. This seemed to be at least a technical problem with the equipment or its method of operation, if not also a contamination problem. This matter was discussed with the facility staff. A review of the equipment and the operation of the microniser is recommended.

C. SUMMARY

1. The safety of operation of the older dewaxing and sintering furnaces should be reviewed.
2. More stringent attention to portable fire extinguisher monthly inspection is recommended.

3. Serious consideration of the issue of providing a fire water system is advised.
4. Training for the fire brigade members should be more oriented towards hands-on fire fighting. The effectiveness of the instruction should be tested.
5. A dike to contain potential nitric acid leak in the South Vault is recommended.
6. Housekeeping is generally good. Attention is however drawn to prompt removal of unneeded combustible objects from the manufacturing areas.
7. A review of the microniser equipment and operation is recommended.