



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

December 23, 1996

NOTE TO: File

FROM: Amar Datta
Licensing Branch
Division of Fuel Cycle Safety
and Safeguards

SUBJECT: FIRE SAFETY REVIEW OF GENERAL ELECTRIC COMPANY, WILMINGTON,
NORTH CAROLINA

The Fuel Manufacturing Operation/Fuels Complex (FMO/FMOX) Buildings where the current fuel manufacturing facilities are located, were constructed in accordance with the building codes existing at the time they were constructed. The buildings do not comply in every respect with the standard of Type I construction, as defined in National Fire Protection Association (NFPA) Code 220 and as described in the NRC Technical Position (TP) published in the Federal Register (57FR35807-13), dated August 10, 1992. However, they are equipped with sprinklers throughout, except for the FMO powder warehouse and the fuel blender areas because of nuclear criticality concern. The sprinkler system largely compensates for the deviation from the recommended standard, and the staff judges that the buildings are adequately protected against fire.

As regards process safety, hydrogen use rates high in the list of the staff's fire safety concerns. Such concerns are answered by appropriate safety devices, such as automatic shut-off valves that are activated in the event of an overpressure or excessive flow, automatic flame supervision and alarm systems in sintering furnaces, and interlocks in the calciner furnace offtake. Other process safety concerns include "burnback" of the uranium oxide powder in the slugger presses and adjoining passages. This hazard is minimized by reducing the use of combustible parts in the flow passages of the oxide. Some neoprene boots are utilized for flexibility, but the hazard from these is minimal.

The scrap oxidizer exhaust ducts are of metal construction and the dissolver vessels are totally enclosed. The incinerator is located in a building separate and sufficiently distant from the main process buildings, thus alleviating fire safety concerns related to waste recovery operations.

The staff reviewed the Dry Conversion Process (DCP) Building that is under construction. The building is of reinforced concrete construction with load-bearing walls and columns that the staff estimates would have a minimum fire resistance rating of 3 hours, though no certification was produced by the licensee. The roof and floor construction would in the staff's judgment also be of equivalent rating. The compartmentalized design of the building, in which some of the hazardous steps of the process will be located in separate enclosures, will further enhance fire safety. Furthermore, sprinkler protection is planned for the entire building. Therefore, the staff has determined that the building incorporates an adequate level of fire protection.

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The facility is served by a 10-inch fire main with 8-inch take-offs to the individual buildings and an adequate number of hydrants. Water is supplied from a 300,000-gallon elevated tank, 150,000 gallons of which is dedicated to the fire protection system. Fifteen deep wells with a pumping capacity of 1125 gpm are the source of water. In addition there is a ground level basin of about 300,000 gallons capacity. This amount of water supply should be adequate for almost all emergencies.

The facility has an alarm system with centralized annunciators that is supervised continuously. It provides training to members of its Emergency Response Team in "incipient" fire fighting. It depends on the nearby Castle Haynes volunteer fire department for assistance in the event of a more serious fire. Assistance may be available from the nearby Wilmington, NC, fire department also.

GE is in the process of performing an Integrated Safety Analysis (ISA) of the facility. The ongoing program appears to be well reasoned. Fire safety is being addressed as an integral part of the ISA.

In conclusion, the staff has determined that the facility maintains an adequate level of fire safety, and there is reasonable expectation of safe operation of the expanded facility when the DCP operation is joined.

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