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OCT 17 1988

MEMORANDUM FOR: Pete J. Garcia, Jr.
Uranium Recovery Field Office
Region IV

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

SUBJECT: INSPECTION OF SEQUOYAH FUELS CORPORATION FACILITY:
SEPTEMBER 13-15, 1988

A report on the assessment of fire safety and the fire protection system at the subject facility is enclosed for your perusal.

Original Signed By:

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

cc:
H. Pettengil, RIV

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REPORT ON THE INSPECTION OF
SEQUOYAH FUELS CORPORATION FACILITY
September 13-15, 1988

Fire Protection

The inspector examined the facility for ascertaining the adequacy of its fire protection systems from the point of view of both prevention of fire and of its detection and suppression before any substantial damage to health, life or property occurs. The assessment includes all areas of the facility, such as the main process building, the solvent extraction (SX) building, the depleted UF_4 building, the tank farm, and the yard. The assessment is discussed in detail below:

1. Facility Construction and Layout

The buildings of the facility are of non-combustible construction as stipulated under license conditions. The SX building, which is considered an extra hazard area, is separated from the main process building by approximately 100 feet of unbuilt space. The inspector however noted the proximity of fuel oil, diesel and propane storage tanks to chemical storage tanks in the tank farm area, the nearest being an HF tank, which is approximately 6 feet from the edge of the diked area of the fuel tanks. There is risk of an oil spill fire arising from a leak or an accident involving tank-trucks delivering bulk chemicals or fuel in the area. Additional protection measures against such fires should be considered.

The inspector examined fire barriers provided in the buildings. These include four automatically actuated fire doors in the main process building. No deficiency was noted in the fire doors.

2. Ventilation System

The ventilation system for the office and laboratory areas are separated from the process areas. The main process areas, the fluorine production areas and the SX building are served by separate exhaust systems. No deficiency is found in this area.

3. Fire Detection and Alarm System

Smoke detectors have been installed in the third floor file rooms and electrical rooms. Certain of the cable trays in the main process building are equipped with heat detectors, which are connected to the alarm panel in the control room . It is unclear to the inspector, after conversation with Mr. Charles E. Gardner, who is in charge of fire protection, whether all of the cable trays are equipped with heat detectors as stipulated in the license renewal. This item needs clarification.

For the sprinklered areas, e.g. the warehouse, and the SX building, which is served by a foam extinguishing system, the actuation of the respective fire suppression systems will cause the alarm system to go off in the control room . Elsewhere in the facility, visual detection is relied on, in which case communication of an alarm is by telephone and by wireless sets personally carried by some workers. The inspector noted the absence of "pull-boxes." These, strategically located, could be effective means of instant transmission of alarm in case of unavailability of the telephone, which in any case did not seem to be readily available in all plant areas.

The absence of smoke or fire detectors in the control room, the administrative areas, the second floor engineering office, change rooms,

lounge/lunch areas, and the laboratories was also noted. There is risk of incipient fires behind the panels in the control room not being detected by the operators. The panels contain moderate to heavy fuel loading in the form of cable insulation, and the fire risk is considerable.

The overall impression of the inspector is that the fire detection and alarm system for both the process and non-process areas can be improved.

4. Fire Suppression Systems

The facility has three fixed fire suppression systems. A 10" looped fire water main with several hydrant and hose stations covers the entire facility. The SX building additionally is protected by a foam system, with foam monitors in the yard also covering the adjacent cooling tower and the RCC evaporator installation. The inspector noted the sprinkler coverages of certain cable trays, the warehouse, the third floor file room, the diesel-driven fire water pump, and the emergency diesel-generator set (the engine only). These systems are judged to be adequate for their respective areas.

Portable hand-held extinguishers were in evidence in all areas of the facility. The number and the type of extinguishers are judged to be suitable for the respective areas, except that, the second floor engineering office is not deemed adequately protected. This area contains moderate quantities of ordinary (Class A) combustibles and additional protection should be considered.

In the main process building, certain of the cable trays are protected, while others, equally inaccessible or not readily accessible, are not. Heat detector coverage and/or water-spray protection of all such cable trays should be considered.

5. Fire Protection Water Supply

The water supply for fire protection from the 250,000 gallon storage tank, which is supplied by the positive head of the Tenkiller reservoir, is judged adequate. An electrically driven pump and a standby diesel pump are adequate to supply the fire water loop, the foam system and the sprinkler system. A smaller jockey pump operates automatically to maintain pressure in the mains. No deficiency is found in this area.

6. Training

Four to five workers in each of the three shifts are on call to respond to a fire emergency. These workers are stated to be trained in the use of portable extinguishers and fire hoses. Some of then belong to nearby volunteer fire departments. Fire drills take place 8 to 9 times a year in the three shifts. Mr. Charles W. Gardner stated that he has attended 36-hour refresher training sessions at the University of Kansas Industrial Fire School during each of the last three years. The other fire-fighting personnel, however, do not receive periodical refresher training of hands-on fire-fighting.

7. Equipment Maintenance

The inspector examined documentation showing maintenance and periodical testing of the fixed and portable fire protection equipment, including the foam and the sprinkler systems, the fire pumps, and the fire mains. The documentation is satisfactory. He also randomly checked several

portable extinguishers, fire hydrants, post indicator valves, and fire hoses. It was learnt that there is no program of periodical testing of the hoses for deterioration, most of which may have been unused for years. NFPA 1962, Standard for the Care, Use, and Maintenance of Fire Hose, requires annual service-testing of fire hoses, which includes pressure test. A deficiency in this respect is noted.

8. Fire Emergency Planning

The inspector examined Facility Operating Procedure E-200, Revision #2, which has detailed instruction on handling various types of chemical fire. It is understood that the facility emergency procedures include detailed instructions on all emergencies, including fire.

The inspector was told that the facility considers itself self-sufficient in handling any fire emergency. The inspector's judgement however is that the facility should maintain liaison with nearby fire departments who are well-equipped with pumpers (fire engines), even if they be some distance away. Such departments should receive orientation tours and, more preferably, joint exercises with the facility fire-fighting personnel. The facility personnel could also benefit from training with such fire departments.

9. The Solvent Extraction Building

Several of the inspectors examined the solvent extraction building and equipment. The six pumper-decanters are each equipped with a rupture disc, which is designed to break when a pressure of 75 psi is exceeded, thus providing pressure relief. The fluid is then let out into a common header, which drains on the floor of the building and eventually into a sump near the center of the building, from which it is pumped back into the system. Ruptures of these discs are not unexpected under the current operating procedures, especially at the start of the process. Also, one of the inspectors witnessed a worker spilling

a substantial quantity of the fluid in his attempt to obtain a sample. The result of both the "designed" and inadvertent spills are a very slippery floor and steel stairs and decks, which makes it quite unsafe to walk in the building. An even greater risk is the fire hazard since the spilled fluid contains a high proportion of n-hexane which is a flammable liquid. The building is equipped with an automatic foam extinguishing system. The inspectors do not however feel that the system should be deliberately and routinely challenged. It is believed that an engineering solution to the problem is feasible and highly desirable.

Summary

The facility's existing fire protection systems, their record of maintenance, and the state of their readiness is judged to be satisfactory. Fire protection of the facility can however be improved. To summarize, the following areas are recommended for review for the purpose of improvement:

1. The hazards of the SX building solvent spills should be reduced.

2. The tank farm should be protected against fuel oil and other flammable liquid spill fire.

3. Fire detection and alarm system in the main process building should be upgraded. Confirmation is sought that all cable trays are wired for heat detection, which is a license condition (Page II. 10-20, License Renewal Application).

4. All cable trays that are difficult to access and have substantial cable loading should be protected by automatic fire suppression systems.

5. Detection of incipient control room panel fires should be prompt and faster than an operator actually can observe it.

6. All areas adjacent to the main process areas, having substantial Class A combustible loading should have upgraded fire detection and/or automatic fire suppression coverage. Water suppression, however, should not be used where it may be incompatible with chemical substances present in the area, such as in the laboratory.

7. All fire hoses should be inspected and service tested as prescribed by NFPA 1962.

8. Workers assigned fire-fighting duties should receive periodical hands-on refresher training.

9. Liaison should be established with nearby fire departments, so that additional assistance is available in case an emergency is too large for the worker team to handle.