

Date: DEC 6 1979

Serial No.: IE:RCI-79-03

TRANSFER OF LEAD RESPONSIBILITY

TO: V. A. Moore, Jr., Acting Assistant Director for Plant Systems, Division of Systems Safety, NRR

SUBJECT: ACCEPTABILITY OF MCGUIRE FIRE PROTECTION SYSTEM

RESPONSIBLE ASSISTANT DIRECTOR: G. W. Reimuth, Assistant Director, Division of Reactor Construction Inspection, IE

DESCRIPTION OF ITEM REQUIRING RESOLUTION:

During the inspection of McGuire 1 & 2 Nuclear Power Plant September 1979 the regional inspector identified two unresolved items pertaining to the Permanent Plant Fire Protection Systems, both of which require evaluation by NRR, for proper resolution.

1. Fire Pumps

Section E.2.(c) of the licensee's McGuire Nuclear Station Fire Protection Review (FPR) states that the fire pump installation is designed to meet the standards developed by the National Fire Protection Association (NFPA) where practicable. The "where practicable" statement was apparently accepted by NRR and as such presents inspection problems in determining exactly what the licensee is committed to. The applicable standard or code for fire pump installations is NFPA-20, "Centrifugal Fire Pumps." However, the fire pump installation at the site does not meet the provisions of NFPA-20 due to the following:

- a. The controller/motor starters for two of the three pumps are located within the turbine building and not adjacent to and within sight of the pump motors as required by Section 7-2.1 of NFPA-20.
- b. The arrangement of the water pressure sensing lines between fire protection system and pressure-activated switches are 1/8 inch in diameter in lieu of 1/2 inch minimum as specified by Section 7-5.2.1 and Figure A-7-5.2.1 of NFPA-20. Also the water sensing lines are not provided with the required check valves, test connections, and related devices.

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- c. The pump starting circuits from the pressure sensing system which are external from the pump controllers/motor starters are not electrically supervised, nor arranged such that breakage, disconnecting, shorting of the wires or loss of power to the circuits will cause continuous running of the fire pumps as required by Section 7-5.2.5 of NFPA-20.
- d. Controllers for two of the three pumps are not listed by Underwriters Laboratories, Inc. (UL) or approved by Factory Mutual Laboratories, Inc. (FM) for use on electric motor driven fire pumps as required by Section 7-1.1.1 of NFPA-20.
- e. The fire pumps are not provided with labels or otherwise identified to verify that the pumps are actually listed by UL or approved by FM for fire pump service as required by Section 2-2 of NFPA-20.

Appendix D of Supplement 2 to the Safety Evaluation Report of the McGuire Nuclear Station prepared by NRR contains the Fire Protection Safety Evaluation Report (FPSER) for the McGuire facility. Section II.A of the FPSER states that the fire pumps are installed in accordance with the applicable NFPA guidelines. This is not correct as there are a number of features in which the fire pump installation do not meet the applicable NFPA Code (NFPA-20). Therefore, NRR should clearly indicate the areas in which the fire pump installation is not required to meet the provisions of NFPA-20.

## 2. Cable Spreading Room Fire Suppression Systems

- A manually actuated "fog-type" sprinkler system is installed in each cable spreading room. Section E.3.(c) of the FPR states that sprinkler systems will conform to the requirements of NFPA-13, "Sprinkler Systems," and NFPA-15 "Water Spray Fixed Systems." Section F.3.(a).(1) of FPR states that a manual water fog system is to be provided for each cable spreading room but does not indicate the design requirements of these systems. The design and installation requirements are needed in order to assure that the licensee has fulfilled his commitments to the NRC. The water spray systems provided do not meet all of provisions of the NFPA codes and the FPR due to the following:
  - a. The systems are designed to discharge water at a density of 0.10 gpm per square foot of floor space whereas Section F.3.(a).1 of the FPR states that the system will be designed to provide a density of 1.5 gpm per square foot. Section 404.1.4 of NFPA-15 requires an impingement at a density of 0.15 gpm per square foot directly on the horizontal or vertical plane containing the cable trays.

- b. The nozzles are arranged to discharge water spray downward and not directly into or on the cable trays as required by Section 4-9.2 of NFPA-15.
- c. The installed nozzles have a different discharge characteristic (K factor of 4.03) than the nozzles used in the hydraulic calculations (K factor of 2.13). The system design calculations were based on a Grinnel Protectospray Nozzle D3-21 whereas a model D3-28 was actually installed.
- d. The system is manually activated whereas Sections 4-4.1.4 and A-4-4.1.4 state that manually operated systems for cable protection are not effective due to the rapid deterioration of the cable insulation when exposed to fire.
- e. Water Flow alarm indicators (paddle type) are installed on the system side of the control valves. Section 3-1.7.3.4 of NFPA-13 prohibits use of this type valve in a dry system since the surge of water when valve is opened may seriously damage the waterflow indicator.

The water spray fire suppression systems for the cable spreading rooms were provided by the licensee at the request of NRR. It appears that NRR may have given some design guidance on these systems. Therefore, the design requirements for these systems should be clearly defined so as to be inspectable.

RECOMMENDATIONS AND PROPOSED COURSE OF ACTION:

1. NRR will evaluate licensee's commitments pertaining to Fire Pump installation and Cable Spreading Room Fire Suppression System.
2. NRR will evaluate the present condition and determine the acceptability of existing facilities or propose corrective action in compliance with the NFPA as proposed by the inspector.
3. IE will provide assistance as necessary and will assure compliance with any new or revised requirements.

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CONCURRENCE:

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