



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

NOV 7 1983

MEMORANDUM FOR: Cecil O. Thomas, Chief  
Standardization and Special Projects Branch  
Division of Licensing

FROM: Victor Benaroya, Chief  
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Division of Engineering

SUBJECT: GRAND GULF NUCLEAR STATION UNIT 1 - TECHNICAL SPECIFICATIONS  
(TAC #51479)

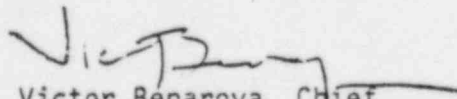
Plant Name: Grand Gulf Nuclear Station Unit 1  
Docket No.: 50-416  
Licensing Stage: OL  
Milestone No.: N/A  
Responsible Branch & Project Manager: LB #2; D. Houston  
Reviewers: J. Stang, F. Witt  
Requested Completion Date: October 31, 1983  
Status: Complete

We have reviewed the plant Technical Specifications and compared them to the Standard Technical Specifications to identify any deviations. Our findings are attached in (Enclosure 1).

In addition, we recommended that emergency lights and portable fire extinguishers also be included in the technical specifications. Proposed technical specifications for both are enclosed. (Enclosure 2).

By letter dated September 9, 1983, the applicant proposed additional changes to the fire detection instrumentation and hose station sections of the fire protection technical specifications. We have reviewed the proposed changes and compared them to the Standard Technical Specifications to identify any deviations. Our findings are included in Enclosure 1.

With the revisions as stated in the enclosures we conclude that these sections of the plant technical specifications are acceptable.

  
Victor Benaroya, Chief  
Chemical Engineering Branch  
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Enclosures: As stated

cc: See next page

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ENCLOSURE 1

Chemical Engineering Branch  
Comparison of Technical Specification to  
The Standard Technical Specification  
Grand Gulf Nuclear Station Unit 1  
Docket No. 50-416

We have reviewed Sections 3/4.4.4, Chemistry; 6.8.4.c, Administrative Controls Post-Accident Sampling; 3.3.7.9, Fire Detection Instrumentation; 3.7.6.1, Fire Suppression Water System; 3.7.6.2, Spray and/or Sprinkler Systems; 3.7.6.3, CO<sub>2</sub> Systems; 3.7.6.4, Halon Systems; 3.7.6.5, Hose Stations; 3.7.6.6, Yard Fire Hydrants and Hydrants Hose Houses, 3.7.7, Fire Rated Assemblies, and compared them to the Standard Technical Specification. Based on our review, we conclude Section 3/4.4.4, Chemistry and 6.8.4.c, Administrative Controls Post-Accident Sampling are acceptable. We recommend the following changes to the remaining sections:

1. Page 3/4 7-28, paragraph 3.7.6.1 Action paragraphs a. and b. - these paragraphs should be rewritten as follows:
  - a. With one pump and/or one fire water storage tank inoperable, restore the inoperable equipment to OPERABLE status within 7 days or provide an alternate backup pump or supply. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.
  - b. With the Fire Suppression Water System otherwise inoperable establish a backup Fire Suppression Water System within 24 hours.
2. Page 3/4 7-29, paragraph 4.7.6.1.1c. - Add the following surveillance requirement: (At least once per 6 months by performance of a system flow test).
3. Page 3/4 7-31, paragraph 3.7.6.2 - Action paragraph a. - delete the special reporting requirement to the Commission.

4. Page 3/4 7-3, paragraph 4.7.6.2 - Add the following surveillance requirement. By a visual inspection of each nozzle's spray area to verify the spray pattern is not obstructed.
5. Page 3/4 7-33, paragraph 3.7.6.3 - Action paragraph a. - delete the special reporting requirement to the Commission.
6. Page 3/4 7-36, paragraph 3.7.6.4 - Action paragraph a. - delete the special reporting requirement to the Commission.
7. Page 3/4 7-37, paragraph 4.7.11.4b - this paragraph should be rewritten as follows:
  - b. At least once per 6 months by verifying Halon storage tank weight to be at least 95% of full charge weight (or level) and pressure to be at least 90% of full charge pressure, and
8. Page 3/4 7-36, paragraph 3.7.6.4 - Action paragraph a. - delete the special reporting requirement to the Commission.
9. Page 3/4 7-39, paragraph 3.7.6.6 - Action paragraph a. - delete the special reporting requirement to the Commission.
10. Page 3/4 7-41, paragraph 3.7.7 - Action paragraph a. - delete the special reporting requirement to the Commission.

In addition, we recommend that the fire extinguishers and emergency lights be included in the Technical Specifications. The emergency lights are needed for performing post-fire safe shutdown. The portable extinguishers are an important early fire defense to prevent small fires from becoming large fires and reducing fire, smoke and suppressant damage to redundant safety systems. Enclosure 2 contains proposed technical specifications for the emergency lights and fire extinguishers.

By letter dated September 9, 1983, the applicant requested changes to the Fire Detection Instrumentation and Hose Station sections of the Technical Specifications.

Based on our review, we conclude that the changes to the Hose Station section reflect the as-built conditions in the plant and therefore are acceptable. We recommend the following changes to the Fire Detection Instrumentation Section of the proposed technical specification.

1. Page 3/4 3-76, paragraph 3.3.7.9 - Action paragraphs a., b. and c. - these paragraphs should be rewritten as follows:
  - a. With any, but not more than one-half the total in any fire zone, Function A fire detection instruments shown in Table 3.3.7.9-1 inoperable, restore the inoperable instrument(s) to operable status within 14 days or within the next 1 hour establish a fire watch patrol to inspect the zone(s) with the inoperable instrument(s) at least once per hour, unless the instrument(s) is located inside the containment, drywell, or steam tunnel then inspect that containment zone at least once per 8 hours (or monitor the containment drywell and steam tunnel air temperatures at least once per hour at the locations listed in Specification 4.6.1.6).
  - b. With more than one-half of the Function A fire detection instruments in any fire zone shown in Table 3.3.7.9-1 inoperable, or with any Function B fire detection instruments shown in Table 3.3.7.9-1 inoperable, or with any two or more adjacent fire detection instruments shown in Table 3.3.7.9-1 inoperable, within 1 hour establish a fire watch patrol to inspect the zone(s) with the inoperable instrument(s) at least once per hour, unless the instrument(s) is located inside the containment, drywell, or steam tunnel then inspect that containment zone at least once per 8 hours (or monitor the containment air temperature drywell and steam tunnel at least once per hour at the locations listed in Specification 4.6.1.6).

c. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

2. Page 3/4 3-77, 3/4 3-78, 3/4 3-79, 3/4 3-80, 3/4 3-80a, 3/4 3-80b, 3/4 3-80c and 3/4 3-80d. Table 3.3.7.9.1 - Revise table 3.3.7.9-1 using the following as an illustration:

TABLE 3.3.7.9-1  
FIRE DETECTION INSTRUMENTATION

<u>INSTRUMENT LOCATION</u> (Illustrative)	<u>HEAT</u> (x/y)	<u>TOTAL NUMBER</u> <u>OF INSTRUMENTS</u> **	
		<u>FLAME</u> (x/y)	<u>SMOKE</u> (x/y)
1. Containment # a. Zone 1 Elevation _____ b. Zone 2 Elevation _____			
2. Control Room			
3. Cable Spreading a. Zone 1 Elevation _____ b. Zone 2 Elevation _____			
4. Computer Room			
5. Switchgear Room			
6. Remote Shutdown Panels			
7. Station Battery Rooms			



8. Turbine

a. Zone 1 Elevation \_\_\_\_

b. Zone 2 Elevation \_\_\_\_

9. Diesel Generator

a. Zone 1 Elevation \_\_\_\_

b. Zone 2 Elevation \_\_\_\_

10. Safety Related Pumps

a. Zone 1 Elevation \_\_\_\_

b. Zone 2 Elevation \_\_\_\_

11. Fuel Storage

a. Zone 1 Elevation \_\_\_\_

b. Zone 2 Elevation \_\_\_\_

(List all detectors in areas required to ensure the OPERABILITY of safety-related equipment).

\*(x/y): x is number of Function A (early warning fire detection and notification only) instruments.

y is number of Function B (actuation of Fire Suppression Systems and early warning and notification) instruments.

#The fire detection instruments located within the containment are not required to be OPERABLE during the performance of Type A containment leakage rate tests.

PLANT SYSTEMPORTABLE FIRE EXTINGUISHERSLIMITING CONDITION FOR OPERATION

All hand-held portable fire extinguishers (including water-based types, dry, chemical, carbon dioxide, halon, loaded stream and dry powder extinguishers) in fire zone boundaries protecting safety related areas shall be functional.

APPLICABILITY: At all times.

ACTION:

- a. With one or more of the above required portable fire extinguishers inoperable, within eight hours replace with a portable fire extinguisher having the same classification and at least equal rating.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

Each of the above required portable fire extinguishers shall be verified to be functional:

- a. At least once per 31 days by visual inspection of the portable fire extinguishers accessible during plant operations to assure operability. The following shall be minimally inspected while conducting the surveillance:
  - (1) Verify extinguisher is in its designated location and unobstructed, that tamper indicators are in place, and that the extinguisher is not damaged, impaired, leaking, under or overcharged, or has any obvious corrosion.
- b. At least once per 12 months by a maintenance inspection of the portable fire extinguishers accessible during plant operations to assure operability. The following shall be minimally inspected while conducting the surveillance:
  - (1) Verify gage shows proper pressure. Extinguishers not using a gage shall be visually inspected for proper level and weighed.
  - (2) Examine nozzle and hose or horn for obstructions and any cracks. Also verify operability of components in those that can be tested by movement.

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- (3) For dry chemical extinguishers determine that extinguishing agent is in a free-running condition. Verify that the contents of the extinguisher match the nameplate and manufacturer's recommendations of weight including cartridge; also inspect gaskets and replace any degraded gaskets.
- (4) Include items listed in paragraph (a).
- c. At least once per 12 months by recharging foam, pump tank water, and pump tank calcium chloride base antifreeze type fire extinguishers to assure their operability.
- d. At least once per 18 months by maintenance inspection of the portable fire extinguishers not accessible during plant operations to assure extinguisher operability.
- e. At least once per 6 years, stored pressure dry chemical extinguishers that require a 12-year hydrostatic test shall be emptied and subjected to the applicable maintenance procedures to assure their operability.
- f. Portable fire extinguishers shall be hydrostatically tested at intervals not exceeding those specified in the following table:

<u>Extinguisher Type</u>	<u>Test Interval (years)</u>
Soda Acid	5
Cartridge operated Water and/or Antifreeze	5
Stored Pressure Water and/or Antifreeze	5
Wetting Agent	5
Foam	5
AFFF (Aqueous Film Forming Foam)	5
Load Stream	5
Dry Chemical with Stainless Steel Shells	5
Carbon Dioxide (Wheeled-Unit Hose Assembly Pressure 1250#)	5
Dry Chemical, Stored Pressure, with Mild Steel Shells, Brazed Brass Shells, or Aluminum Shells	12
Dry Chemical, Cartridge or Cylinder Operated, with Mild Steel Shells	12
Bromotrifluoromethane - Halon 1301	12
Bromochlorodifluoromethane - Halon 1211	12
Dry Powder, Cartridge or Cylinder Operated, with Mild Steel Shells	12
Compressed Gas Cylinders - Wheeled Units	5

- g. At least once per 12 years by hydrostatic test at 300 psi for dry chemical cartridge operated extinguisher hose assemblies to assure their operability.
- h. Prior to returning a portable fire extinguisher to functional status following repairs or maintenance by performance of a visual inspection of the affected portable fire extinguisher.

- 1. Prior to returning a portable fire extinguisher to functional status following any event which could have affected its structural integrity and/or operability by performance of a hydrostatic test to the affected extinguishers.

JUSTIFICATION FOR REQUESTED CHANGE

Presently no standard technical specification exist for portable fire extinguishers. Since prompt extinguishment of fires is important to reactor safety, the application of portable fire extinguishers rather than automatic suppression systems should be preferred. Properly maintained portable fire extinguishers along with a trained fire brigade (present NRC requirement) should control and extinguish fires while in the incipient stage. The purpose of portable fire extinguishers and hose stations is to control and/or extinguish fire before it gains in magnitude to affect safety related equipment and also to reduce the need for automatic suppression system actuation causing additional safety related concerns. This has been referred to as "Fire Suppression System Interaction Lines of Inquiry" resulting in safe shutdown equipment failure or environmental qualification problems presently under technical review by NRR.

Also, the Electric Power Research Institute has furnished a test report to the NRC titled, "Water as a Means of Cable Fire Protection and Operational Effects Experience" (EPRI NP-1193) dated October 1979. This report describes industry experiences with the use of water as an extinguishant and points out the potential for initiating additional hazards from the operation of water sprays.

In 1976, the U.S. Department of Labor, Occupational Safety and Health Association of Fire Equipment Distributors (NAFED) performed an in-depth broad-base study on the use of portable fire extinguishers. The scope of this study examined the performance of 14,091 fire extinguishers on 5,400 fires. The report concluded that 327 of 5,400 fires were not extinguished while attempting to use portable fire extinguishers. Reasons given for not extinguishing the fires included extinguishers which had been previously discharged and left in services in a empty or near empty condition, broken syphons, caked chemical, foreign objects lodged in horn, clogged hoses, damaged extinguishers, frozen extinguishers, etc.

Surveillance requirements are referenced from NFPA Pamphlet 10, ANSI/ANS 59.4 - 1979 titled, "Generic Requirement for Light Water Nuclear Power Plant Fire Protection", and from discussions with licensees present practice for surveillance requirements on portable fire extinguishers.

SURVEILLANCE REQUIREMENTS

Paragraphs (a), (b), and (c) were included for the purpose of performing an operational test to give reasonable assurance that the extinguisher is fully charged and operable. These requirements are in accordance with NFPA 10, Sections 4-3, 4-4 and 4-5.2, respectively.

Paragraph (e), (f), and (g) were included for the purpose of performing a maintenance test which includes a thorough examination, any necessary

repair or replacement and the need for a hydrostatic test. These requirements are in accordance with NFPA 10, Sections 4-4.1.1, 5-3 and 5-4.4, respectively.

Paragraph (i) was added to give assurance that the extinguisher would be hydrostatically tested prior to being put back in service if involved in any event which could affect its structural integrity. This requirement is in accordance with NFPA 10, Section 5-1.3(d).

PLANT SYSTEMS

10

EMERGENCY LIGHTING UNITS

LIMITING CONDITION FOR OPERATION

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All Emergency Lighting Units in fire zone boundaries protecting safety related areas shall be functional.

APPLICABILITY: Modes 1, 2, 3 and 4

ACTION:

- a. With one or more of the above required emergency lighting units inoperable, within eight hours the unit shall be replaced with a operable emergency lighting unit.
- b. The provisions of Specifications 3.0.3 and 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

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Each of the above required emergency lighting units shall be verified to be functional:

- a. At least once per 31 days by an operational test (to include verifying unit operation, electrolyte level and position of hydrometer discs (lead acid only) of the emergency lighting units accessible during plant operations to assure their operability.
- b. At least once per 6 months by a maintenance test (to include cycling battery and checking change-over setting) of the emergency lighting units accessible during plant operations to assure their operability.
- c. At least once per 18 months by maintenance test of the emergency lighting units not accessible during plant operations to assure their operability.
- d. Prior to returning a emergency lighting unit to functional status following any event which could affect its operability, repairs, or maintenance by performance of a operational test to the affected lighting unit.

JUSTIFICATION FOR REQUESTED CHANGE

It is noted that no specific test or performance specification exist for emergency lighting units. Based on the most probable fire scenario, safe shutdown of the plant is dependent in some cases on alternative shutdown systems. This requiring personnel to travel through areas of the plant without natural or normal lighting available to reach safe shutdown equipment and perform necessary functions.

Two previous Region III inspections (Big Rock Point 50-155/83-13(DE) and D. C. Cook 50-315/82-08(DE)) have indicated inadequate or nonexistent preventative maintenance program implementation for emergency lighting units.

In addition, Section III.J of Appendix R to 10 CFR Part 50, requires at least an 8-hour battery power supply be provided. However, no emergency lighting unit operability test program is required at this time.

Surveillance requirements were derived from American National Standard Institutes (ANSI) document ANS 59.4-1979 Edition, titled, "Generic Requirements for Light Water Nuclear Power Plant Fire Protection" and from discussions with teledyne big beam emergency lighting unit manufacturer representatives.

#### SURVEILLANCE REQUIREMENTS

Paragraph (a) requires a monthly inspection according to ANSI 59.4, Table 2 and manufacturer recommendations to verify unit operation, electrolyte level and position of the Hydrometer Discs (Lead Acid Only).

Paragraph (b) requires a semi-annual inspection according to ANSI 59.4, Table 2 and manufacturer recommendations to cycle the battery, checking the change-over setting and verifying items listed in paragraph (a).

Paragraph (c) is a standard paragraph from S.T.S. to assure emergency lighting units in high radiation areas will be inspected within a reasonable time.

Paragraph (d) was added to give assurance that the unit would be tested prior to being put back in service if involved in any event which could affect its operability.