

YANKEE ATOMIC ELECTRIC COMPANY



20 Turnpike Road Westborough, Massachusetts 01581

May 10, 1978

United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Office of Nuclear Reactor Regulation
Victor Stello, Jr., Director
Division of Operating Reactors

Reference: (a) License No. DPR-3 (Docket No. 50-29)
(b) USNRC letter to YAEC dated August 19, 1977
(c) USNRC letter to YAEC dated February 14, 1978

Dear Sir:

Subject: Nuclear Plant Fire Protection Functional Responsibilities,
Administrative Controls, and Quality Assurance

As requested in Reference (c), Yankee Atomic Electric Company has reviewed its fire protection program for the Yankee Rowe Atomic Power Station for conformance with the guidelines, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance".

The attachments to this letter are the result of this review, Yankee-Rowe does not intend to meet the specifics of the guidelines in five areas. Our intentions are as follows:

1. Qualifications

The Yankee Atomic Electric Company Fire Protection Coordinator meets all of the NRC requirements for his position with the exception of that calling for three years in responsible charge of fire protection work. At present, he has only two years experience in this area. However, Yankee feels that the commitment expressed by the company in its appointment of a full time individual in this position, the job descriptions and the qualifications of the person holding this position (attached) fully comply with the intent of these guidelines.

2. Drills

Fire drills at Yankee-Rowe meet the intent of the guidelines except that Yankee-Rowe does not intend to conduct quarterly drills for all fire brigade members. Since Yankee-Rowe has five operating shifts, it would require a minimum of twenty

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drills per year to meet the quarterly requirement; or, discounting outage time, approximately one drill every three weeks. Aside from the time required to plan, execute and critique the drills, these done on the day shift result in a complete disruption of productive work at the plant. Yankee-Rowe's plan to conduct a minimum of two drills per quarter, with at least one on a back shift, will insure that each brigade member participates in at least one drill per year. It is felt that this will result in a more reasonable training effort, reduced impact on productive work, and still provide an effective drill program.

3. Requiring only fire retardent wood in those areas containing equipment required for safe shutdown.

Yankee Rowe does not require the use of fire retardent wood in these areas. Fire retardent wood is expensive, difficult to obtain and is easily compromised by surface damage. In addition, it would be impractical to maintain an inventory of both fire retardent wood for safety related areas and non-fire retardent wood for other areas. Therefore, Yankee-Rowe is planning to use a non-fire retardent wood throughout the plant and is implementing a program which controls the use of wood in safety related areas. These controls will require a review of the hazards presented and specification of special precautions, if required when wood is brought into a safety related area. Yankee-Rowe's program will provide the necessary level of protection to insure the wood introduced into the plant will not cause an unacceptable increase in fire hazards to safety related areas.

4. Requirement that procedures be developed with pre-planned strategies for combating fires.

Yankee-Rowe does not believe that developing pre-planned strategies for fire fighting as described in your guidelines is practical or desirable. Pre-planned strategies are useful to municipal fire departments which must protect a large number of buildings with various hazards with which they are not completely familiar. Therefore, written procedures for fighting fires in areas that only a few department members see during fire inspections are desirable. This is not the case with Yankee-Rowe's fire brigade. The brigade members work at Yankee-Rowe and are therefore very familiar with the fire fighting equipment used for specific hazards and their locations. Since every fire is different, it would be misleading to provide one way to fight a fire and impossible to address every possible way to fight a fire. Yankee-Rowe trains its brigade members annually on equipment and hazard locations to reinforce each member's familiarity. In addition, the Fire Brigade leaders are trained in fire tactics and strategy which address specific plant areas and the various ways to combat a fire in those areas. The validity of this training is checked by the performance of full scale drills at later

dates. For the above reasons, Yankee-Rowe feels that written pre-planned strategies would be of no benefit to fire protection at Yankee-Rowe.

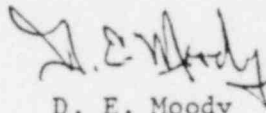
5. Requirement that procedures include descriptions of off-site fire department resources and response times.

The fire brigade members are aware, through their training program, of the off-site department resources. The approximate response time of these off-site departments are known. To clutter up procedures with this type of unrelated and unnecessary information is impractical and unrealistic.

We trust that the information submitted is sufficient. If other information is required, please contact us.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY



D. E. Moody
Manager of Operations

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FIRE PROTECTION ORGANIZATION

- 1.0 The organizational responsibilities and lines of communication pertaining to fire protection are defined between the various positions through the use of organizational charts and functional descriptions in the Technical Specifications and the response to Appendix A to Branch Technical Position APCS 9.5-1. The responsibilities of the positions/organizations are as follows:
- a. The Fire Protection Coordinator is responsible for the formulation, implementation, and assessment of the effectiveness of the Yankee Rowe Nuclear Power Plant fire protection program.
 - b. The Fire Protection Coordinator is directly responsible for:
 - (1) Formulating, implementing, and periodically assessing the effectiveness of the fire protection program for the Yankee Rowe nuclear power plant including fire drills and training conducted by the fire brigade and plant personnel. The results of these assessments should be reported to the Assistant Vice President - Operations with recommendations for improvements or corrective actions as deemed necessary.
 - (2) The following NFPA Publications were used for guidance to develop the fire protection program:
 - No. 4 - "Organization for Fire Services"
 - No. 4A - "Organization of a Fire Department"
 - No. 6 - "Industrial Fire Loss Prevention"
 - No. 7 - "Management of Fire Emergencies"
 - No. 8 - "Management Responsibilities for Effects of Fire on Operations"
 - No. 27 - "Private Fire Brigades"
 - c. The Plant Superintendent is responsible for the overall administration of the plant operations and emergency plans which include the fire protection and prevention program and which provides a single point of control and contact for all contingencies. The responsibility for the day-to-day in-plant implementation of the fire protection program has been assigned to the Technical Assistant to the Plant Superintendent (TAPS).

- d. The TAPS Department is responsible for the following:
- (1) Implementation of periodic inspections to: minimize the amount of combustibles in areas containing equipment required for safe shutdown; determine the effectiveness of housekeeping practices; assure the availability and acceptable condition of all fire protection systems/-equipment, emergency breathing apparatus, emergency lighting, communication equipment, fire stops, penetration seals and fire retardant coatings; and assures prompt and effective corrective actions are taken by the responsible department to correct conditions adverse to fire protection and preclude their recurrence.
 - (2) The fire fighting training for operating plant personnel and the plant's fire brigade; reviews the selection of equipment; surveillance follow of periodic inspection and testing of fire protection systems and equipment in accordance with established procedures to determine the acceptability of the systems under test.
 - (3) Assists in critique of all fire drills to determine how well the training objectives have been met.
 - (4) Provides for reviews and evaluations of proposed work activities to identify potential transient fire loads.
 - (5) Implements a program for indoctrination of all plant contractor personnel in appropriate administrative procedures which implement the fire protection program, and the emergency procedures relative to fire protection.
 - (6) Implements a program for instruction of personnel on the proper handling of accidental events such as leaks or spills of flammable materials that are related to fire protection.
- e. The Operational Quality Assurance Group is responsible for fire protection quality assurance.
- The Operational Quality Assurance Group is responsible for assuring the effective implementation of the fire protection program by planned inspections and scheduled audits. They assure and verify that results of these inspections or audits are promptly reported to cognizant management personnel.
- f. The on-shift Shift Supervisor and two auxiliary operators comprise the plant fire brigade.

- (1) The plant fire brigade has the responsibility for fighting plant fires. The authority and responsibility of each fire brigade member relative to fire protection is clearly defined in procedures.
- (2) The responsibilities of the fire brigade correspond with the actions required in the fire fighting process.
- (3) The responsibilities of the fire brigade members under normal plant conditions, do not conflict with their responsibilities during a fire emergency.
- (4) The minimum number of trained fire brigade members available onsite for each operating shift is consistent with the activities required to combat the most significant fire. The size of the fire brigade is based upon the functions required to fight fires with adequate allowance for injuries and available off-site fire departments.
- (5) The recommendations for organization, training, and equipment of "PRIVATE FIRE BRIGADES" as specified in NFPA No. 27-1975, including the applicable NFPA publications listed in the Appendix to NFPA No. 27, were considered appropriate criteria for organizing, training, and operating a plant fire brigade.

2.0 Qualifications

- a. The qualification requirements for the Fire Protection Coordinator are as follows:
 - (1) Bachelors Degrees from an accredited college or university or demonstration of equivalent knowledge.
 - (2) Employment for a minimum of ten years in engineering work at a professional level or an advanced degree with less experience.
 - (3) Sufficient experience and demonstrated ability to initiate, plan, direct, and take complete charge of important technical work.
- b. The fire brigade members qualifications include satisfactory completion of a physical examination for performing strenuous activity, and of the fire brigade training described in Attachment No. 2.

- c. The personnel responsible for the maintenance and testing of the Fire Protection Systems are qualified by training and experience for such work.
- d. The personnel responsible for the training of the fire brigade are qualified by training and experience for such work.

FIRE BRIGADE TRAINING

The training program is used to assure that the capability to fight potential fires is established and maintained. The program consists of an initial classroom instruction program followed by periodic classroom retraining, practice in fire fighting and fire drills:

1.0 Classroom Instruction

- a. The initial classroom instruction includes:
 - (1) Identification of the fire hazards and associated types of fires that could occur in the plant, and an identification of the location of such hazards.
 - (2) Identification of the location of fire fighting equipment for each fire area, and familiarization with layout of the plant including access and egress routes to each area.
 - (3) The proper use of available fire fighting equipment, and the correct method of fighting each type of fire. The types of fires covered should include electrical fires, fires in cables and cable trays, hydrogen fires, flammable liquid, waste/debris fires, and record file fires.
 - (4) Indoctrination of the plant fire fighting plan with specific coverage of each individual's responsibilities.
 - (5) The proper use of communication, lighting, ventilation and emergency breathing equipment.
 - (6) The direction and coordination of the fire fighting activities (fire brigade leaders only).
 - (7) The toxic characteristics of expected products of combustion.
 - (8) The proper method for fighting fires inside buildings and tunnels.
 - (9) Detailed review of fire fighting procedures and procedure changes.
 - (10) Review of latest plant modifications and changes in fire fighting plans.

- b. The instruction will be provided by qualified individuals knowledgeable, experienced, and suitably trained in fighting the types of fires that could occur in the plant and in using the types of equipment available in the nuclear power plant.

Members of the "Fire Protection Staff" and Fire Brigade Leaders may conduct this training.

- c. Instruction will be provided to all fire brigade members and fire brigade leaders.
- d. Regular planned meetings will be held to repeat the classroom instruction program over a two year period.

2.0 Practice

Practice sessions will be held for fire brigade members on the use of equipment used to extinguish fires of similar magnitude, complexity, and difficulty as those which could occur in the plant. Training sessions will provide brigade members with experience in actual fire extinguishment and the use of emergency breathing apparatus under strenuous conditions. These practice sessions will be provided at regular intervals but not to exceed 1 calendar year for each fire brigade member.

3.0 Drills

Fire brigade drills will be performed in the plant so that the fire brigade can practice as a team. Drills will include the following:

- a. Assessment of fire alarm effectiveness, time required to notify and assemble fire brigade, and selection, placement and use of equipment.
- b. Assess each brigade member's knowledge of his role in the fire fighting strategy for the area assumed to contain the fire. Assess the brigade members conformance with established plant fire fighting procedures and use of fire fighting equipment, including self-contained emergency breathing apparatus, communications equipment, and ventilation equipment, to the extent practicable.

- c. The simulated use of fire fighting equipment required to cope with situation and type of fire selected for the drill. The area and type of fire chosen for the drill will be varied such that brigade members are trained in fighting fires in all areas containing equipment required for safe shutdown which contain significant fire hazards. The situation selected will simulate the size and arrangement of a fire which could reasonably occur in the area selected, allowing for fire development due to the time required to respond, to obtain equipment, and organize for the fire, assuming loss of automatic suppression capability.
- d. Assessment of brigade leader's direction of the fire fighting effort, as to thoroughness, accuracy, and effectiveness.
- e. The drills will be performed at regular intervals with a minimum of two drills per calendar quarter, so that each fire brigade member participates in at least one drill per calendar year. At least one drill per calendar quarter will be performed on a "back shift". A sufficient number of these drills, not less than one per calendar quarter, shall be unannounced, to determine the fire readiness of the plant fire brigade leader, brigade fire protection systems and equipment.
- f. The drills will be pre-planned to establish the training objectives of the drill. The drills are to be critiqued to determine how well the training objectives have been met and to maximize their effectiveness. Unannounced drills will have their critiques performed by members of the management staff responsible for plant safety and security. At three year intervals, drills should be critiqued by qualified individuals independent of the utility's staff.

4.0 Records

Records of training provided to each fire brigade member including drill critiques will be maintained to assure that each member receives training in all parts of the training program. These records of training will be available for review.

CONTROL OF COMBUSTIBLES

Administrative controls will be established to minimize the amount of combustibles that equipment required for safe shutdown may be exposed to. These controls will be established to govern:

- a. The handling of and limitation on the use of the combustibles, flammable and explosive hazards such as flammable gases and liquids, HEPA and charcoal filters, dry unused ion exchange resins or other combustible supplies in areas containing equipment required for safe shutdown and to assure that these items are not stored in these areas.
- b. The transient fire loads during maintenance and modifications such as combustible and flammable liquids, wood and plastic products, spilled oil, oil drums, and other combustible materials in buildings containing equipment required for safe shutdown. This control requires an in-plant review of proposed work activities to identify potential transient fire loads. The onsite staff member(s) designated the responsibility for reviewing work activities for potential transient fire load will specify the required additional fire protection in the work area.

When the transient fire load causes the total fire load to exceed the capabilities of existing suppression systems and equipment, additional portable suppression equipment will be brought into the area.

- c. The removal of all waste, debris, scrap, rags, oil spills, or other combustibles resulting from the work activity, in the area following completion of the activity, or at the end of each work shift, whichever is sooner.
- d. Periodic inspection for accumulation of combustibles.
- e. The use of wood in areas containing equipment required for safe shutdown. These controls will require a review of the hazards present and specification of special precautions if necessary.

CONTROL OF IGNITION SOURCES1.0 Administrative Controls

Administrative controls will be instituted to protect equipment required for safe shutdown from fire damage or loss resulting from work involving ignition sources, such as welding, cutting, grinding or open flame work; administrative controls prohibit the use of open flame or combustion smoke for leak testing and controls prohibit smoking and other ignition sources in certain areas.

2.0 Control of Welding, Cutting, Grinding, and Open Flame Work

- a. All cutting, welding, grinding or open-flame work will be authorized by a responsible foreman or supervisor through a work permit. The responsible foreman or supervisor will receive a basic industrial fire fighting and fire prevention course covering anticipated fires, such as electrical fires, fires in cables and cable trays, hydrogen fires, hydrocarbon fires, solvent fires, waste/debris fires, and record file fires.
- b. Before issuing the permit, the responsible foreman or supervisor will physically survey the area where the work is to be performed and establish that the following precautions have been accomplished:
 - (1) All moveable combustible material below and within the potential splash area of the cutting, welding, grinding or open flame work has been removed.
 - (2) All immovable combustible material below and within the potential splash area has been thoroughly protected by metal guards, or flameproof covers, and fire extinguishers, hose, or other firefighting equipment are provided at the work site.
 - (3) A fire watch, trained in the use of and equipped with extinguishing equipment to prevent and combat fires, is present throughout any operations in which there is potential for fire that might damage equipment required for safe shutdown. A fire watch will be provided where cutting, welding, grinding or open flame is performed above or within the potential splash area of any open cables, flammable liquids, scaffold boards, paper, rags, or other objects on the same elevation of the work or if combustible materials are below the work area where openings exist. A fire watch will be provided for all cutting, welding, grinding, and open flame work in the

Control Room, Cable Tray House, Switchgear Room, Diesel Generator cubicles, and other required areas that contain significant amount of cable or flammable liquids.

The fire watch will remain on the work site while work is performed and remain in the area for at least 30 minutes after the work is completed to check for smoldering fires.

- (4) All equipment to be used is in a safe, working condition. Oxyacetylene equipment has been checked for leaks.
- c. The signature concurrence of a member of the plant's management or a quality control inspector certified to make this concurrence will be obtained whenever the supervisor or foreman determines that a fire watch is not required.

3.0 Leak Testing

Open flame or combustion smoke for leak testing will be prohibited. Procedures for leak testing will require the concurrence of the Plant Operations Review Committee to verify that the leak test method is acceptable and would not present a potential ignition source.

4.0 Smoking and Ignition Source Restriction

Smoking will be prohibited in areas containing equipment required for safe shutdown (except where "smoking permitted" areas have been specifically designated by the responsible plant personnel) and in areas containing flammable or potentially explosive materials or atmospheres that present a hazard to safety related equipment. The areas will be identified with "No Smoking" signs.

FIRE FIGHTING PROCEDURES

Fire fighting procedures shall be established to cover such items as notification of a fire, fire emergency procedures, and coordination of fire fighting activities with offsite fire departments. The fire fighting procedures will identify:

- a. Actions to be taken by the individual discovering the fire, such as, notification of control room, attempt to extinguish the fire, and actuation of local fire suppression systems.
- b. Actions to be taken by the control room operator and the need for brigade assistance upon report of a fire or receipt of an alarm on the control room annunciator panel, such as: announcing location of fire over PA system, sounding fire alarms and notifying the Shift Supervisor of the type, size, and location of the fire.
- c. Actions to be taken by the fire brigade after notification by the control room operator of a fire, including: location to assemble and a brief discussion on fire fighting strategy for the hazard involved, and the type of fire fighting equipment to be used.
- d. Actions to be taken by the Emergency Director, plant personnel, and Security Guards after notification of a fire.
- e. Actions to be taken that will coordinate fire fighting activities with offsite fire departments, including: identification of the individual responsible for assessing the situation and calling in outside fire department assistance when needed; identification of the individual who will coordinate or direct fire fighting activities when aided by offsite fire fighting assistance; provisions for including offsite fire fighting organizations in fire brigade drills at least once per calendar year; and provisions for training offsite fire department personnel in basic radiation principles, typical radiation hazards, and precautions to be taken in a fire involving radioactive materials in the plant.

QUALITY ASSURANCE

The programmatic requirements of Yankee Operational Quality Assurance Program, YOQAP-1-A shall be applied as appropriate to provide the level of quality assurance warranted for design, procurement, installation, inspection and testing of fire protection systems and equipment. Quality assurance for design and testing of fire protection systems for or affecting areas containing equipment required for safe shutdown will be done in accordance with existing EDCR or PDCR procedures as discussed in Section 4.1 of YA-GEN-9, Fire Protection Systems Design.

Quality assurance for procurement of fire protection equipment will be done in accordance with plant procedures that have been reviewed by the Yankee Fire Protection Coordinator.

RESUME

EDWARD A. SAWYER

Fire Protection Coordinator
Yankee Atomic Electric Company

EDUCATION

1977 - Series of short intensive courses on Fire Protection for Nuclear Power Plants, Fire Protection for Nuclear Power Plant Operating Personnel, and Fire Hazard Analysis for Nuclear Power Plant. All given by NATLSCo and Professional Loss Control, Inc.

September 1976 - December 1976 - Worcester Polytechnical Institute. Engineering Methodology for Building Fire Safety, Evaluation.

August 1976 - University of Wisconsin-Extension. Fire Safety Design for Buildings.

1965 - Northeastern University - BS in Electrical Engineering.

PROFESSIONAL SOCIETY
MEMBERSHIPS

Society of Fire Protection Engineers National Fire Protection Association.

INDUSTRY COMMITTEE
MEMBERSHIP

EEI Fire Protection & Prevention Task Force

ANSI Steering Committee on Nuclear Power Plant Fire Protection Standards

ANSI N18.10 Group writing Fire Hazard Analysis Appendix for N18.10 Standard

EXPERIENCE

Yankee Atomic Electric Company

July 1976
to
Present

Fire Protection Coordinator directly responsible for the overall preparation and implementation of the fire prevention and protection programs for three operating nuclear power plants - Yankee Rowe, Vermont Yankee, and Maine Yankee. Specifically responsible for the performance of the fire hazard analysis at the plants, and the development and implementation of recommendations concerning the updating and backfitting of the plants to the applicable

requirements contained in Appendix A to the Branch Technical Position on Fire Protection, APCSB 9.5-1, Regulatory Guide 1.120, and any further NRC requirements in the area of fire protection. Responsible for insuring the development of fire prevention and protection procedures, including programs for the training of the plant staff and plant fire brigade. Responsible for ultimate review and approval of the design of Seabrook Station and NEP 1 and 2 with respect to coordination of design with fire protection requirements. Responsible for the ultimate review and approval of the fire hazard analysis and the Fire Protection Reevaluation Report. Responsible for dealing with the insurers for the operating plants in matters relating to fire protection.

August 1974
to
July 1976

Project Manager on the Central Maine Power Company Nuclear Project directly responsible for coordinating the development of project design and engineering schedules with the principal contractors, administration of the Project Engineers under my direction, developing, monitoring and controlling project costs; including dealing with insurers of the project; generally responsible for the licensing of the project and for engineering, design, and quality assurance activities related to the work of the principal contractor organizations associated with the project.

January 1972
to
August 1974

Electrical Project Engineer on the Seabrook Nuclear Power Station. Duties consisted of supervision of the Electrical Engineering effort of the A/E and Yankee in PSAR submittal and in plant design, and responsibility to the Project Manager for licensing activities, engineering coordination, notification of any cost or schedular problems, including dealing with NELPIA in areas of fire protection design.

Project Engineer on the engineering, construction and testing of an Advanced Off-Gas Control System for the Vermont Yankee Nuclear Power Plant. Duties consisted of supervising the engineering, scheduling and cost control efforts of the A/E and Yankee personnel; and following of the construction

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effort and test effort for the system.

November 1971
to
January 1972

Assistant to the Project Engineer for Vermont Yankee Nuclear Power Plant. Duties consisted of aiding in plant licensing, writing of plant Environmental Report.

September 1970
to
November 1971

Vermont Yankee Nuclear Power Plant

Technical Assistant to the Plant Maintenance Supervisor. Duties consisted of aiding Maintenance Department personnel in preparing the plant for commission, ranging from work on Microwave Communications, Metering, and Relaying to work on large motors, switchgear, and power transformers.

January 1968
to
September 1970

Yankee Atomic Electric Company

Engineer in the Project Group for the Vermont Yankee Nuclear Power Plant. The Project Group coordinated the work done on the plant by the Architect Engineer, Nuclear Steam Supplier, and the various other vendors and suppliers. Work was mainly in the Electrical and Instrumentation coordination and design, with some excursions into Nuclear and Mechanical areas, including working with NELPIA in developing fire protection systems.

April 1963
to
June 1965

New England Electric System

Brayton Point Generating Station, Somerset, Massachusetts. Co-op employment as Assistant to the Electrical Department Foreman of a 500 Mw Thermal Generating Plant - Maintenance planning, job planning, parts ordering, responsibility for maintenance of fire protection systems.

Yankee Atomic Electric Company Location: Westboro

JOB DESCRIPTION

Position - FIRE PROTECTION COORDINATOR

Reporting to - Manager of Operations

Experience
Required -

1. Bachelors Degree from an accredited college or university or demonstration of equivalent knowledge.
2. Employment for a minimum of ten years in engineering work at a professional level or an advanced degree with less experience.
3. Sufficient experience and demonstrated ability to initiate, plan, direct, and take complete charge of important technical work.
4. Familiarity with NFPA and other applicable codes and standards and with fire prevention and protection techniques.

Responsibilities
and Duties -

1. General

The fire prevention coordinator shall prepare and implement a fire prevention and protection program for plant design, construction and operation. He shall work with the Engineering, Projects, Construction and Operations Departments to implement this program. The program shall encompass such considerations as plant and building layouts, fire hazards evaluation, fire prevention provisions, fire protection requirements, interpretation of applicable codes, standards and regulations, construction plans and procedures for fire prevention and protection, system testing, maintenance provisions, fire brigade organization and planning and plant emergency fire procedures.

Some specific responsibilities follow.

2. Operating Plants

- a. Responsible for recommendations concerning the updating and backfitting of Yankee plants to the requirements contained

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