

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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March 9, 1984

Docket No. 50-423
B11059

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: (1) B. J. Youngblood to W. G. Council, Draft SER for Millstone
Nuclear Power Station, Unit 3

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit 3
NRC Chemical Engineering Branch (Fire Protection)
Review Meeting, February 16, 1984

A meeting was held between the NRC-CMEB (fire protection section) and Northeast Nuclear Energy Company (NNECO) in Bethesda, Maryland on February 16, 1984 to discuss nine (9) Draft SER open items contained in Reference (1). During the meeting each of the nine items was discussed. A status of each open item was noted as defined by one of the following three categories:

Closed - No further NNECO input or action is needed to resolve the NRC concern.

Confirmatory - NNECO must provide the requested information on the Millstone 3 docket, either by a letter or FSAR amendment.

Open - No resolution possible at this time, NNECO to address.

Attachment I provides the status of those Draft SER Open Items. It was agreed that NNECO will transmit a letter to the NRC providing a written response on each of those Draft SER open items by March 15, 1984. NNECO also agreed to provide all additional information as committed to in confirmatory items as the information becomes available. The attached responses to the open items (Attachment II) simply formalize the above commitment given orally at the meeting. The responses will be incorporated into the FSAR in a future amendment.

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During the meeting NNECO informed the NRC staff that a review of information contained in the Fire Protection Section of the FSAR against the Branch Technical Position (BTP CMEB 9.5-1) and actual plant installation is being performed. It is noted that because of the complexity of nuclear power plant construction, some instances may arise where either conformance to the BTP guidelines is impractical/unattainable or the BTP guideline fails to explicitly address a particular concern. These isolated cases will be identified and reviewed on an individual basis and comparable/equivalent fire protection or justification in terms of a deviation to the BTP guidelines will be provided at the earliest possible date. It is NNECO's intent to resolve all draft SER open items in the fire protection area by May 1984 but it should be recognized that fire protection has been and continues to be an evolving subject. Because of this, NNECO will continue to address fire protection issues, requirements and concerns as evaluations and re-evaluations are continued based on new interpretations, new findings, new requirements, and new technological changes.

If you have any concerns related to the information contained herein or any questions related to our responses, please contact our Licensing representative directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY ET AL

By Northeast Nuclear Energy Company, their Agent

W. G. Council
W. G. Council
Senior Vice President

C. F. Sears
By: C. F. Sears
Vice President Nuclear and
Environmental Engineering

STATE OF CONNECTICUT)
COUNTY OF HARTFORD) ss. Berlin

Then personally appeared before me C. F. Sears, who being duly sworn, did state that he is Vice President of Northeast Nuclear Energy Company, Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Lerrain J. Alamo
Notary Public

My Commission Expires March 31, 1988

ATTACHMENT I

Status of the NRC-CMEB (Fire Protection)
Draft SER Open Items Discussed at the Meeting
with the NRC-CMEB February 16, 1984

<u>Item No.</u>	<u>Description</u>	<u>Status</u>
FP-1	Fire Hazard Analysis	Closed
FP-2	Potential Systems Interaction	Confirmatory
FP-5	Qualification of Ventilation System Penetrations	Closed
FP-6	Qualification of Metal Roof Deck and Contents of Concealed Spaces	Closed
FP-12	Installation of Fire Detectors	Confirmatory
FP-13	Valve Supervision	Closed
FP-15	Qualification of Fixed Water Extinguishing Systems	Closed
FP-18	Control Room Console Smoke Detectors	Open
FP-19	Cable Spreading Room Protection	Open

ATTACHMENT II

Responses to the Draft SER Open Items

Open Items

Chemical Engineering Branch - Fire Protection

FP-1 Fire Hazards Analysis (Draft SER Section 9.5.1.1)

The applicant's fire hazards analysis does not identify transient fuel loads due to combustibles expected to be used in normal operations as required by BTP CMEB 9.5-1, Section C.1.b, nor does the analysis identify the potential heat (BTU per pound, gallon, or cubic foot) of the combustible materials in the plant. We will require the applicant to provide this information, in accordance with BTP CMEB 9.5-1, Section C.1.b. This is an open item.

Response (2/84)

Section 5 of the Fire Protection Evaluation Report (FPER) specifically identifies the fixed combustible materials located throughout Millstone 3. Also provided in Section 5, are the approximate quantities and potential heat releases (Btu's/ft²) for these materials. In addition, NNECO has calculated/documented the expected fire duration for the worst case in-situ fire in each fire area. From this information, NNECO has evaluated the fire hazards associated with each area and has provided the appropriate fire protection to ensure that the risks due to fire are at a minimum. This protection is in the form of area suppression, area detection, suppression specific to a hazard, and/or separation of areas by three hour fire rated barriers.

Not identified in the FPER are the transient combustibles associated with each area. NNECO has defined transient combustibles as those items (lube oil, solvents, protective clothing, etc.) that may be located in or pass-through areas of the plant to support operations, maintenance, repairs, or modification activities. It is NNECO's position that transient combustibles do not represent a significant fire load and need not be specifically listed in the fire hazards analysis. The following represents NNECO's reasoning for this position.

1. Transient combustibles are transported/located in areas of the plant only when required for a specific job. When the need arises to introduce transient combustibles, they will be limited to the minimum amount required to complete the job. The most direct route to the area will be used when transporting transient combustibles. In other words, if transient combustibles are not needed in certain areas, they won't be found in those areas. (Eg. 55 gallon drums of lube oil won't be passing through the control room or cable spreading room, etc.)
2. Fixed fire loadings for most areas of the plant are well below 1½ hour fire duration. Small amounts of transient combustibles would not increase the fire loading to the 3-hour fire rating the area boundaries maintain. For example, fire area AB-1D contains 3 charging pumps and 3 reactor plant component cooling pumps. The total amount of lube oil for these six pumps is 150 gallons with a fire loading content of 2600 Btu/ft². The calculated fire duration for the area is 44 minutes. If it is assumed (worst case) that the entire lube oil inventory was changed out at the same time, an additional 150 gallons (considered 3 times the largest single transient) would be introduced to the area. In this case the fire loading increased by 2 minutes (an insignificant amount) to 46 minutes.

Open Items

Chemical Engineering Branch - Fire Protection

3. All work will be performed under a work order system. Work orders provide a mechanism for the operating staff to review what transient combustibles will be used, how they will be handled, and for what duration as well as safety precautions to be observed. Administrative control procedures have been developed which will assure that transient combustibles are kept to a minimum, fire watches will be posted, as required, and prevent the storage of transient combustibles in areas where they are not needed.
4. Transient combustibles (flammable liquids) will be transported/stored in approved safety cans, or for larger amounts such as lube oil, 55 gallon drums may be used. Again, these liquids will be kept to a minimum.
5. The use of Class A materials is kept to a minimum. Wooden material is normally either fire coated or pressure treated. They will be used for a specific job, then removed from the area.
6. Separation of safe shutdown equipment is such that at least one division of safe shutdown components will remain free from the effects of a single fire. Transient combustibles do not represent a hazard to safe shutdown, as stated in NRC's published Generic Letter 83-33, "A fire involving such materials (transient combustibles) would not over power the fire protection features provided in accordance with Section III.G and therefore, are only of concern when exemptions or deviations are requested".

In conclusion, NNECO feels that transient combustibles cannot be inventoried to the point where they could be documented in the Section 5 of the FPER. It can only be expected that items required for use in each area will be found in that area. And that the diversity of shutdown components inherent to the plant assures us that at least one train of safe shutdown equipment will always be free from the effects of fire. Based on the above, NNECO requests a deviation from the requirement of CMEB 9.5-1, Section C.1.b for documenting transient combustibles.

Status (2/84)

Closed.

Open Items

Chemical Engineering Branch - Fire Protection

FP-2 Potential Systems Interaction (Draft SER Section 9.5.1.1)

We are concerned whether the mechanisms by which fire and fire fighting systems may cause the simultaneous failure of redundant or diverse trains have been adequately considered in the design. We will require the applicant to identify the mechanisms that were considered in the fire hazards analysis and the measures taken to preclude the fire or fire-suppressant-induced failure of redundant or diverse safety trains and to document the procedures. This is an open item.

Response (2/84)

Section C5.b.1 of the Standard Review Plan CMEB 9.5.1 states:

"Fire Protection features should be provided for structures, systems, and components important to safe shutdown. These features should be capable of limiting fire damage so that:

- a. One train of systems necessary to achieve and maintain hot shutdown conditions from either the control room or emergency control station(s) is free of fire damage, and
- b. Systems necessary to achieve and maintain cold shutdown from either the control room or emergency control station(s) can be repaired within 72 hours."

To meet the guidelines of Position C5.b.1, one of the following means of ensuring that one of the redundant trains is free from fire damage is suggested.

- a. Separation of cables and equipment and associated circuits of redundant trains by a fire barrier having a 3 hour rating.
- b. Separation of cables and equipment and associated circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area, or
- c. Enclosure of cables and equipment and associated circuits of one redundant train in a fire barrier having a 1 hour rating. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.

If the guidelines listed above cannot be met, then alternative or dedicated shutdown methods should be provided.

Millstone 3 Fire Protection Evaluation Report Section 6.2 lists the function required and equipment available to achieve and maintain safe shutdown. From this list, each fire area was evaluated to assure that redundant components/systems required for safe shutdown are separated by fire barriers having a fire resistance rating of 3 hours. Some isolated cases exist where the 3 hour barrier option was not used, and in this area one of the two options was utilized or a deviation was/will be requested.

Open Items

Chemical Engineering Branch - Fire Protection

FP-2 Cont.

This approach provides assurance that a fire in any one fire area does not effect the ability to achieve and maintain safe shutdown at Millstone 3.

In addition to the redundant train/fire analysis noted above, NNECO evaluated the effect of fire suppression activities. This evaluation was conducted to assure that at least one method of achieving and maintaining safe shutdown was free from the effects of the firefighting system activities. Further, additional safeguards were incorporated into the design to reduce the possibility/effects of inadvertent operation.

As an example, the CO₂ system, which provides protection for the Cable Spreading Room, East and West Switchgear Rooms, North and South Tunnels, Normal Switchgear Room, and East and West MCC Rod Drive Areas, have cross-zoned detection incorporated into their design. This detection scheme eliminates the possibility of a failure in one detector causing the CO₂ system to inadvertently operate. In addition, each discharge nozzle was or will be field checked to assure that discharging CO₂ would not directly impinge on sensitive electrical equipment.

The combination of field verification, proper system design, and separation of redundant safe shutdown components by rated fire barriers, assures that at least one method of achieving and maintaining safe shutdown would be free from the effects of fire or fire suppression activities.

Status (2/84)

Confirmatory.

Open Items

Chemical Engineering Branch - Fire Protection

FP-5 Qualification of Ventilation System Penetrations (Draft SER Section 9.5.1.4)

The HVAC penetrations of fire-rated barriers will be provided with Underwriters Laboratory (UL) - labeled fire damper assemblies that have 1-1/2 hour or 3 hour ratings. The applicant has not indicated that these dampers will be installed in barriers which have ratings of 1-1/2 hour or 3 hours respectively. We will require the applicant to verify that penetration openings for ventilation systems meet the guidelines of BTP CMEB 9.5-1, Section C.5.a(4). This is an open item.

Response (2/84)

As requested, NNECO has verified that all ventilation system penetrating fire barriers at Millstone 3 meet the guidelines of BTP CMEB 9.5-1, Section C.5.a(4).

In those instances where HVAC ductwork is required to penetrate an established fire barrier, as delineated on S&WE drawings titled "Plant Fire, Radiation, and Pressure Boundaries", the penetration opening has been provided with a fire damper rated equivalent to the fire barrier. These fire dampers are listed by Underwriters Laboratory (UL) for their intended service and have been installed in accordance with the guidelines of NFPA-90A. In no instances have 1½ hour fire-rated dampers been installed in series in order to achieve a composite three hour fire-rating. Those HVAC ductwork penetrations of 3-hour fire-rated barriers have been supplied with fire dampers tested and rated to serve this function. Fire dampers and sleeves which are required to be seismically supported have been installed in accordance with the attached sketch (sk-item 23B).

There is only one instance in the plant where a fire damper (3HVR-DMPF44) is not installed directly in the fire barrier it services as shown on attached sketch (sk-item 23A). Due to physical constraints, the fire damper could not be installed in the fire barrier (wall) so it was installed some distance away and the intervening ductwork protected. In order to afford an equivalent level of protection, the fire damper, intervening ductwork and supports were fire proofed utilizing a 2 hour fire-rated material. This two hour fire-rating was determined to be adequate because it exceeds the postulated fire duration for the surrounding area based upon the fire loading. The 2-hour-rating was achieved by wrapping the ductwork and fire damper with 3 layers M20A Fire Barrier secured with cord 34 (manufactured by the 3M Company). The duct supports have been fire proofed utilizing a cementitious fire-proofing material to a minimum thickness in accordance with UL listed designs to achieve a 2-hour fire-rating. The fireproofing coating utilized is Pyrocrete 102 manufactured by the Carbolite Company. Technical Data Sheets for the above referenced products are attached for your information.

Status (2/84)

Closed.



CROSS-HATCHED AREA TO BE
2HR FIRE RATED DUCT

F.8

12"x14"
BOT EL 90'-4"

FIRE DAMPER
*DMPF44

30"x30"
BOT EL 88'-5"

16"x12" ISD

30"x21" BOT
EL 83'-0"

3HVR*FLT3A

2'-4"
7"

EL
85'-0"

2'-0"

2'-0"

10" DIA
CL EL 87'-5"

1'-6"

3'-6"

7'-0"

*RE 19B SPEC M627-
DET B
SK12179-B-313A

*FN 12A(-O)
CL EL 82'-7 1/4"

EL 78'-6"

16"x12" ISD-

3'-5" REM

*FE88A
(-P)

6"

4"

*DMPF29

*DMPB13B
BOT EL 77'-0"

*RE 19A SPEC M627
DET A SK12179-B-313B

*FN 12E(-P)
CL EL 70'-7 1/4"

MOTOR REM SPACE (TYP)

3HVR*FLT3B

34" DIA
CL EL 70'-7 1/4"

2'-9"

7"

*FE88B
(-O)

FLEX. CONN

EL 66'-6"

30"x30"
BOT EL 69'-4 1/4"

SK-ITEM 23A

Open Items

Chemical Engineering Branch - Fire Protection

FP-6 Qualifications of Metal Roof Deck, and Contents of Concealed Spaces (Draft SER Section 9.5.1.4)

Metal deck roof construction is not described as either noncombustible or listed as Class I by Factory Mutual. We will require the applicant to meet the guidelines of BTP CMEB 9.5-1, Section C.5.a(10).

Suspended ceilings and their supports are of noncombustible materials, but concealed spaces above the suspended ceiling are not described as being devoid of combustibles. We will require the applicant to confirm that concealed spaces above suspended ceiling meet the guidelines of BTP CMEB 9.5-1, Section C.5.a(11). This is an open item.

Response (2/84)

Metal deck roof construction at Millstone 3 meets Underwriter's Laboratories (UL) Class A requirements. All components of the roofing systems are listed in the Factory Mutual (FM) Guide for Class 1 Construction. However, the quantity of asphalt required by the roofing manufacturers' specification exceeds the limits specified by FM. Because of this, the roof assemblies themselves are not listed as FM Class 1 or UL "Acceptable for Fire".

The use of Class 1 components assures that the heat release rates of the assemblies are kept to a minimum. It is NNECO's opinion that the increased thickness of asphalt used in the roof assemblies does not affect the fire properties inherent to the asphalt itself (which meets FM guides). Thus limiting the rate of vaporization from the asphalt.

The Containment Structure Enclosure (CSE) is the only Nuclear Safety Related Structure with metal deck roof construction. However, no safe shutdown equipment, Nuclear Safety Related (NSR), or any other equipment is located between the CSE and the containment exterior. In addition, the metal deck used in the CSE roofing system is an airtight sandwich panel assembly which would inhibit the passage of combustible gases.

Non-Safety related structures with metal deck roof construction are summarized in Table FP-6-1.

For all structures listed, automatic suppression system and/or interior hose stations with sufficient water volumes and pressures are installed for protection of interior roof areas. Yard fire hydrant, with sufficient hose and accessories are provided for exterior roof areas. In addition, smoke and/or heat detection has been installed in many areas of these structures, as discussed in the FPER.

Based on the above, NNECO believes the roof assemblies are equivalent to FM Class 1 assemblies or UL "Acceptable for Fire" assemblies and that a deviation for CMEB 9.5-1 Section C.5.a(10) is justified.

Open Items

Chemical Engineering Branch - Fire Protection

With regard to combustible materials located in concealed spaces above suspended ceiling NNECO provides the following.

Suspended ceilings do exist in certain non-safety related areas. Combustibles above these ceilings are limited to the facility wiring and in most cases are installed in conduits. The loss of this wiring, due to a fire, would not affect safety related areas or impact plant safety.

Concerning suspended ceilings in safety related areas, NNECO has identified the following two areas:

- o Suspended ceilings do exist in the peripheral areas of the control room complex. Combustibles above these ceilings are limited to two 8" wide cable trays which carry cables from the instrument rack room to the main control board (see Sketch #1). The cables are IEEE-383 qualified and are of the purple division (1 tray) and non-associated division (1 tray). NNECO has evaluated this configuration and has committed to install a smoke detector above and below the suspended ceiling in the kitchen. The smoke detectors provide assurance that a fire will be detected in its earliest stage and that notification of control room operators (next room) will occur.
- o Cables do exist in the overhead of the control room which utilizes an egg crate design light diffuser. The light diffuser is made of metal (non-combustible) and allows the passage of air (smoke) from the underside through to the space above. It should be noted that the light diffuser does not form a physical barrier/concealed space and is not considered a suspended ceiling.

Status (2/84)

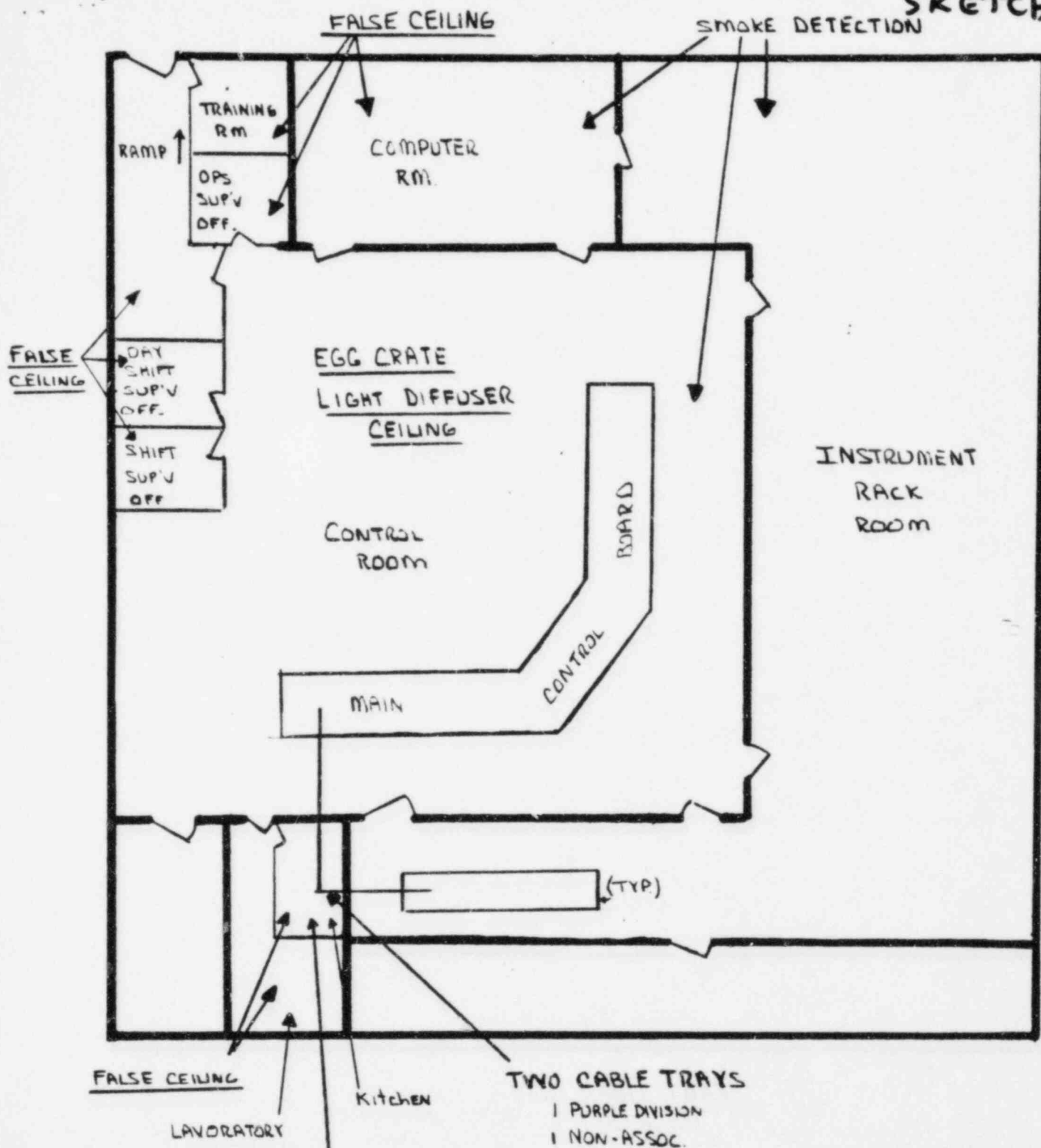
Closed.

TABLE FP-6-1

Non-Safety Related Structures with Metal Deck Roof Construction

<u>Building (or portion)</u>	<u>Remarks</u>
Fuel (el 55' roof only)	Airtight sandwich panel metal decked used in roof construction (same as CSE roof)
Turbine	Heat & smoke automatic roof vents provided (12179-EA-1A)
Service	Heat & smoke automatic roof vents provided (12179-EA-1B)
Machine Shop	
Aux Boiler	
Warehouse 5/Unit 2 CPE	2-HR fire proof coating under roof deck in records storage area; that area is Class I
Solid Waste	
Liquid Waste	
Boron Recovery Tank Enclosure	
Control (Storage Area Only)	

PRELIMINARY SKETCH



CONTROL ROOM COMPLEX

SKETCH #1

Not to Scale

Open Items

Chemical Engineering Branch - Fire Protection

FP-12 Installation of Fire Detectors (Draft SER Section 9.5.1.5)

The applicant's Fire Protection Evaluation Report does not indicate that fire detectors have been selected and installed in accordance with NFPA 72E. We will require the applicant to select and install early warning fire detectors as a minimum in accordance with NFPA 72E. This is an open item.

Response (2/84)

Millstone 3 Specifications for Fire Detectors (smoke, heat and ultra-violet types) requires that the supplier/vendor provide UL listed and/or FM approved equipment. Furthermore, the specification also requires that the detectors provided are suitable for the environment to which they (detectors) will be installed.

Selection of the type of detectors to be installed in the plant was based on the burning characteristics of materials within the protected areas. In areas, where high concentrations of cable are present, a combination of photoelectric and ionization type smoke detectors are installed. In areas where oil represents the major fire hazard, either smoke heat, UV detectors or a combination of fire detectors and systems are installed. Each detection system provides an early warning signal to the main fire control panel. In some cases, the detection system also activates the area's suppression system as well.

With regards to the detection system's design and installation, the applicable guidelines of both NFPA 72E and the manufacturers technical recommendations have been considered when developing the design criteria. In accordance with NFPA 72E codes requirements, Engineering judgement was employed in developing design criteria and determining actual installation locations. Installation locations were determined using the following considerations in order to establish consistent Engineering judgement.

Types of Postulated Fires:

Selection as to the type of detector to be used was based on the type of postulated fire (smoldering, large free burning, etc.) for in each area.

Ceiling Construction/Shape:

Ceiling configuration and types (smooth, girder and beam construction) were considered when determining detector locations.

Ceiling Height:

Ceiling heights varied throughout the plant. Reduced spacing of detectors was considered on a case by case basis depending on ceiling height.

Ventilation Effects:

Open Items

Chemical Engineering Branch - Fire Protection

FP-12 Cont.

The direction of air movement throughout each area was considered when determining detector locations. In addition, the possible effects of stratification were also considered.

Locations of Hazards:

The amount of combustible material, burning characteristics and the projected fire plume and resultant smoke distribution paths were considered when evaluating detector locations. In areas, where no or limited combustible loading was present, and no heat or smoke was anticipated, no detectors were deemed necessary for that immediate area.

Considering the applicable guidelines of NFPA 72E, the manufacturers recommendations and sound engineering judgement, it is NNECO's position that Millstone 3 fire detection system design will provide a reliable early warning of a fire condition. The above referenced information satisfies the intent of BTP 9.5.1 Section C.6.a requirements.

Status (2/84)

Confirmatory.

Open Items

Chemical Engineering Branch - Fire Protection

FP-13 Valve Supervision (Draft SER Section 9.5.1.5)

The applicant has not stated that all valves in the fire protection water supply system are supervised in accordance with our guidelines in BTP CMEB 9.5-1, Section C.6.c(2). We will require the applicant to supervise all valves in the fire protection water supply system in accordance with our guidelines. This is an open item.

Response (2/84)

Fire protection valves, which are within the flow path of Millstone 3's fire water supply system, will be either electrically supervised or administratively controlled in accordance with BTP CMEB 9.5-1 section C.6.c(2) guidelines.

Electrically supervised valves will provide annunciation to the main fire control panel located within Millstone 3's control room.

Administrative control procedures, addressing the frequency of valve inspection and method of supervision for valves which may be subject to tampering have been developed in accordance with NFPA 26 guidelines.

Status (2/84)

Closed.

Open Items

Chemical Engineering Branch - Fire Protection

FP-15 Qualifications of Fixed Water Extinguishing Systems (Draft SER Section 9.5.1.5)

The applicant has not stated that fixed water extinguishing systems conform to the requirements of NFPA 13 and/or NFPA 15. We will require the applicant to design and install all fixed water extinguishing systems in accordance with NFPA 13 and/or NFPA 15 to meet out guidelines of BTP CMEB 9.5-1, Section C.b.c(3).

Response (2/84)

All Millstone 3 specifications for fire protection water extinguishing systems require the installing Contractor to engineer, design, instail, and test the fire suppression systems in accordance with the applicable guidelines of NFPA 13 and 15 respectively. These designs have been and continue to be reviewed by Stone and Webster Engineering, applicant's Fire Protection Staff, and applicant's Insurance Carrier, American Nuclear Insurers to insure compliance. However, due to the nature of nuclear power plant construction, some instances may arise where either conformance to the code is impractical/unattainable or the code fails to explicitly address a particular concern. These isolated cases will be reviewed on an individual basis and comparable/equivalent fire protection will be provided and compliance with the intent of the code will be achieved.

Status (2/84)

Closed.

Open Items

Chemical Engineering Branch - Fire Protection

FP-18 Control Room Console Smoke Detectors (Draft SER Section 9.5.1.6)

Smoke detectors are not provided inside control room cabinets and consoles. We will require the applicant to install such detectors in accordance with our guidelines in BTP CMEB 9.5-1, Section C.7.b. This is an open item.

Response (2/84)

NNECO has evaluated the guidelines of BTP CMEB 9.5-1, Section C.7.b to Millstone 3's control panel design with regards to smoke detection within the control cabinets. As a result of this evaluation, it is NNECO's position that an equivalent level of fire detection/protection for the control cabinets has been provided and therefore, NNECO is requesting that a deviation to BTP CMEB 9.5-1, Section C.7.b guidelines be granted based on the following information:

Control Room Fire Protection Features

Millstone 3's Control Room has been provided with a general area smoke detection system. This detection system utilizes a combination of photoelectric and ionization type smoke detectors in order to provide an early warning of a smoke/fire condition (refer to the attached drawing for the detector layout). Since the major fire loading within the control cabinets is cable insulation, which represents a smoldering type fire, detectors are located at the ceiling level of the room utilizing the applicable sections of NFPA 72E as guidance. In addition, cable tray arrangements and ventilation paths, both in the room and control cabinets were considered when determining the appropriate detector location. Alarm annunciation of a detector will occur at both the main control board and the fire control panel. Both locations are provided with an audible/visual alarm to alert personnel of a smoke/fire condition.

Portable fire extinguishers have been provided throughout the control room area in accordance with the guidelines of NFPA 10 (Portable Fire Extinguishers). Selection of the type of extinguishers provided was based on the postulated fire within the immediate area. In addition, hose stations and fire extinguishers have been provided in the adjacent area (Service Building) to support manual firefighting efforts.

The control room is manned on a continuous basis by NNECO's Operation Department. On each shift, selected operations personnel, who are fully trained fire brigade members, are assigned the responsibility of supporting Millstone 3's fire brigade assignment for that shift. It can be expected, that any fire within a control cabinet will quickly be detected, controlled and extinguished by these qualified fire brigade personnel.

Control Cabinet Design Features

Millstone 3's control cabinets are constructed of metal and therefore are rated as non-combustible. The major fire loading within the cabinets is cable insulation which conforms to IEEE 383 requirements. Since the chemical

Open Items

Chemical Engineering Branch - Fire Protection

composition of the cable insulation offers an inherent fire retardent characteristics, a postulated fire within the cabinets is expected to result in either self-extinguishing or of a slow burning, smoldering type.

Class 1E circuits providing instrumentation and control functions are separated from their redundant class 1E circuits as well as from non-class 1E circuits in accordance with Regulatory Guide 1.75. Separation of redundant circuits has been achieved by either distance or the employment of metal barriers/enclosures. The electrical loads for the control cabinet wiring are of the low voltage type. Considering the characteristics of the cable insulation and the low voltage currents within the circuits, the potential for sufficient heat to be generated from an electrical fault to ignite adjacent cabling is remote.

Natural ventilation paths within the control cabinets move in the upward direction toward the ceiling area. Louvers located in the bottom sections of the cabinets provide the means for air intake. Air exhaust and the removing of any heat build-up within the cabinet is achieved by openings provided for cable routing at the top of the cabinet. This upward ventilation path will not only remove any heat generated but will also carry any products of combustion upward to the room ceiling area which is provided with smoke detectors, thus resulting in the detection and early warning of a smoke/fire condition.

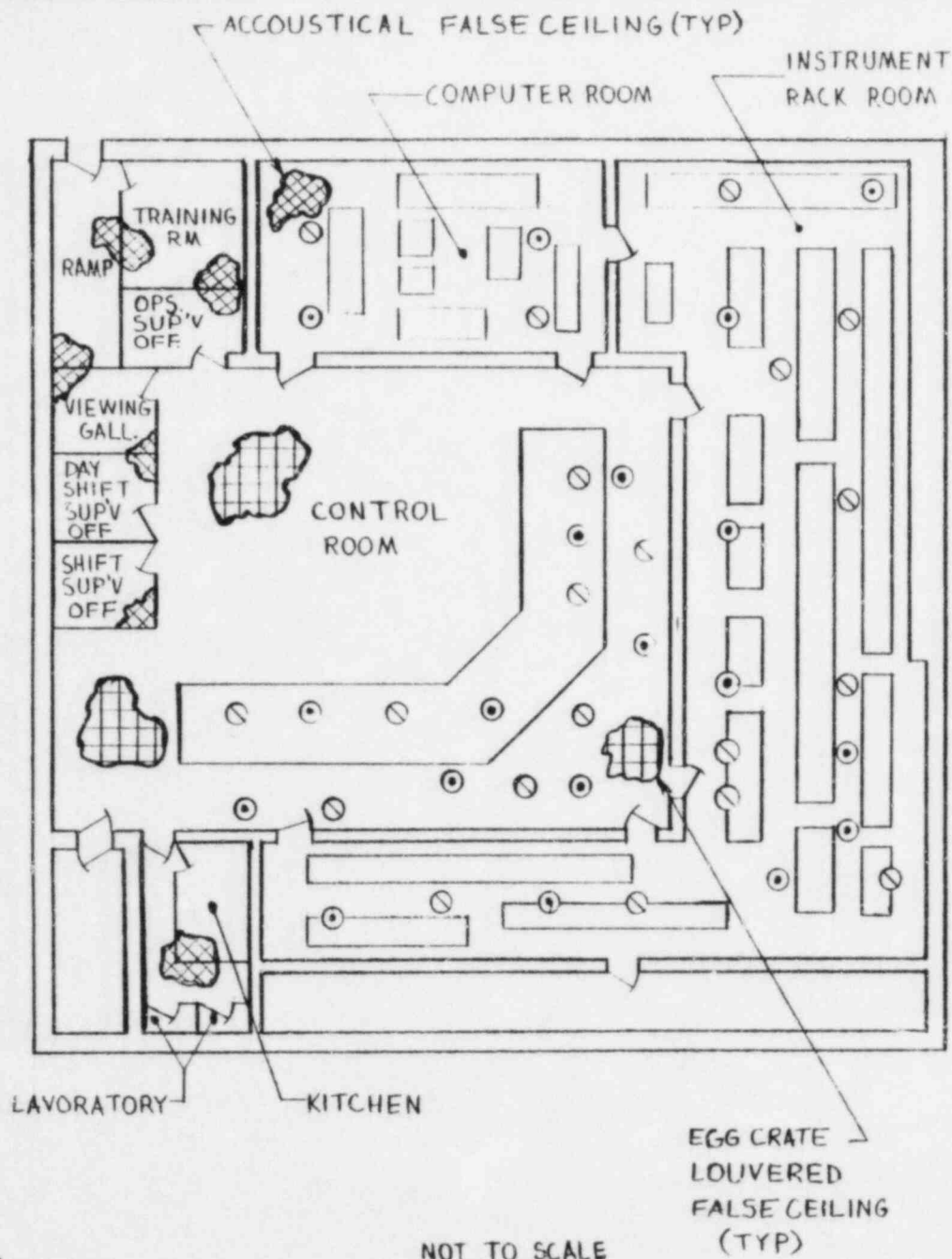
Control Cabinet Fire Scenario

As previously discussed, NNECO has postulated that the only fire that is likely to occur is a smoldering, slow-burning type fire. When evaluating the possible damage that could result from such a fire, it was established that there are several means of detecting a fire at its early stages. Since the control room is manned on a continuous basis, NNECO believes that credit for operations personnel's sense of sight and smell should be considered as part of means for detecting a fire. Whether by the sight of smoke or smell of burning material, prompt operator action to control and extinguish the fire will occur. Considering the human factor and the installed early warning smoke detection system, it is NNECO's belief that an equivalent level of fire detection has been provided for the control cabinet in lieu of installing smoke detectors within the cabinet themselves. It should be noted that even postulating the worst case fire, one which is not detected and is allowed to develop into a fire which causes major damage within the control cabinet, safe shutdown capability would not be affected. Millstone 3's design for achieving safe shutdown has provided alternate safe shutdown capability from dedicated control cabinets located in the switchgear rooms of the Control Building (elevation 4'6"). Therefore, a loss of the Control Room's main control cabinets would not affect the ability of the plant to achieve safe shutdown.

Status 2/84

open

open



GENERAL NOTES

1. UNDER FLOOR AREAS OF INSTR. RK. RM., AND COMP. RM. NOT SHOWN
2. ● - DEPICTS PHOTOELECTRIC TYPE SMOKE DETECTOR
3. ⊙ - DEPICTS IONIZATION TYPE SMOKE DETECTOR
4. THERE IS A FALSE CEILING INSTALLED IN THE CONTROL ROOM. SMOKE DETECTORS ARE INSTALLED ABOVE THIS FALSE CEILING. NO SMOKE DETECTORS ARE INSTALLED IN THE CABINETS OR CONSOLES OF THIS AREA.
5. THERE IS A FALSE CEILING INSTALLED IN THE COMP. RM. SMOKE DETECTORS ARE INSTALLED BELOW THIS FALSE CEILING. NO SMOKE DETECTORS ARE INSTALLED IN THE CABINETS OR CONSOLES OF THIS AREA.
6. THERE IS NO FALSE CEILING IN THE INST. RK. RM. AND ALSO THERE ARE NO SMOKE DETECTORS INSTALLED IN THE CABINETS OR CONSOLES OF THIS AREA.

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Open Items

Chemical Engineering Branch - Fire Protection

FP-19 Cable Spreading Room Protection (Draft SER Section 9.5.1.6)

The primary fire suppression in the cable spreading room is a total flooding automatic carbon dioxide system. We will require the applicant to provide an automatic fixed water suppression system as the primary fire suppression means in the cable spreading room with the carbon dioxide system as a backup to meet the guidelines of BTP CMEB 9.5-1, Section C.7.c. This is an open item.

Response (2/84)

A discussion of cable spreading room fire protection was presented in the NRC-CMEB (Fire Protection) meeting. The discussion included a description of the design features of carbon dioxide system and compliance with the BTP Guidelines. The NRC requested that NNECO provide information on disarming the carbon dioxide system and the water suppression system as a backup to meet the BTP Guidelines.

Status (2/84)

Open.