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Statements of Staff Position

QUESTION:

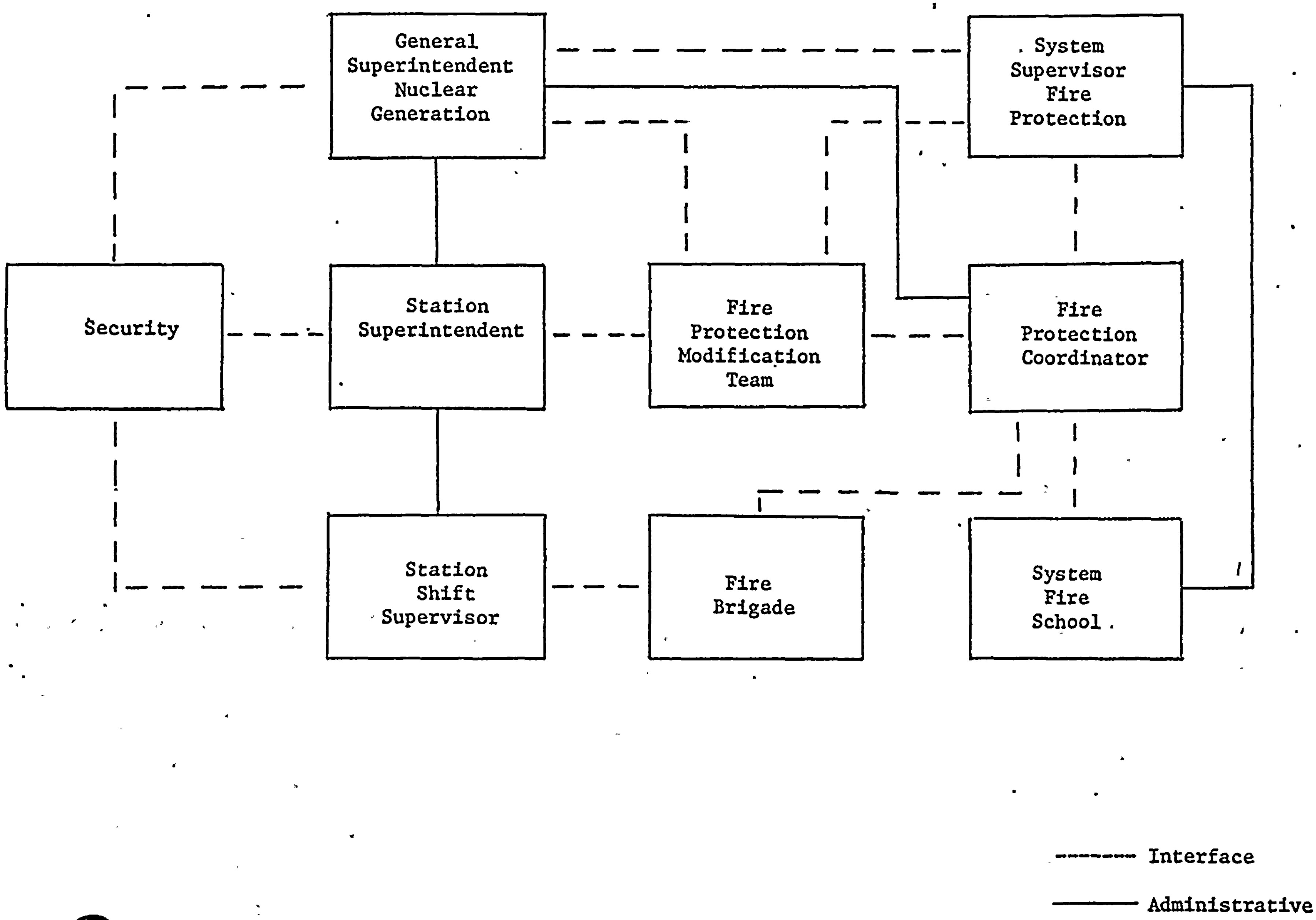
1. Fire Protection Program - Organizational Chart

Provide an organizational chart of the offsite and onsite personnel involved in the fire protection program.

RESPONSE:

The attached figure shows the interfaces of the Nine Mile Point fire protection program.

NINE MILE POINT SITE FIRE PROTECTION INTERFACES



QUESTION:

2. Combined Fire and Security Emergency

Describe the responsibilities of key plant personnel in the event of a combined fire and security emergency.

RESPONSE:

The General Superintendent - Nuclear Generation is directly responsible for the safe and efficient operation of all generating units on the site. He is responsible for safeguarding the general public and all onsite personnel from radiation exposure and for adherence to the operating licenses and technical specifications. He has ultimate responsibility for the fire protection program.

The Station Superintendent, Unit 1, the Maintenance Superintendent, the Results Superintendent, the Office Supervisor, Fire Protection Coordinator and the Training Supervisor report directly to the General Superintendent.

In the absence of the General Superintendent - Nuclear Generation, another Superintendent or Supervisor shall be designated to act as General Superintendent. In the event of serious abnormal conditions the General Superintendent, Acting General Superintendent or Station Superintendent has authority to shut down the station. When all superintendents are off site, the Station Shift Supervisor assumes full responsibility for the station.

Should a fire emergency arise during the off hours (i.e. when the normal complement of supervisors are off) the Station Shift Supervisor along with the Fire Brigade Captain and the Fire Brigade will attempt to immediately extinguish the fire. Emergency Plan Implementing Procedure #2 would immediately be put into effect. Supervisors would be called in accordance with Emergency Plan Implementing Procedure #9 - On-Call Procedure.

Should a security emergency arise, the Sergeant on duty will evaluate the cause. If the cause warrants, he will notify the following:

The Station Shift Supervisor
The Oswego County Sheriff's Department
The Supervisor Nuclear Security
The Security Investigator

During a security emergency, the security procedures will be followed. The Security force will take appropriate measures to counter a security contingency. This can include withdrawing from the fire brigade to implement security procedures. During the day members of the reserve fire brigade would be available to ensure a 5 man fire brigade if security personnel were unavailable. During off hours if the security personnel were unavailable for the fire brigade the Station Shift Supervisor, and Auxiliary Operator "C" would be available unless the fire was in the control room·complex. If a fire was in the control room complex during a security contingency, a full safe shutdown crew would be required to shutdown the plant. For this highly unlikely case only 3 fire birgade members would be available. For all other conditions five fire brigade members would be available.

QUESTION:

3. Equipment Required For Safe Shutdown

The information provided in the Fire Protection Program report is not sufficiently detailed. The information does not indicate whether there are any fire areas in the plant containing equipment that performs a function required for safe shutdown that cannot be performed by equipment located in another fire area. For each fire area, provide a list of the equipment (including cable runs) located in the area that can be used to perform functions required for safe shutdown. For each item on the list, indicate whether its function can be performed by equipment located in another fire area and identify the area. In preparing the list for each fire area, the following functions should be considered to be required for safe shutdown:

1. Placing the reactor in a subcritical condition and maintaining the reactor subcritical indefinitely.

2. Bringing the reactor to hot shutdown conditions and maintaining it at hot shutdown for an extended period of time (i.e., longer than 72 hours) using only normal sources of cooling water.

3. Maintaining the reactor coolant system inventory indefinitely using only normal sources of makeup water.

4. Bringing the reactor to cold shutdown conditions within 72 hours.

If all the redundant equipment available to perform any of the above functions (assuming a loss of offsite electrical power) is located in a single fire area, identify the specific separation that exists and any combustible material between the redundant equipment.

RESPONSE:

We have utilized the following assumptions to develop this response:

1. A design basis fire occurs. That is a large fire in one fire zone where safety related equipment is located.

2. Credit was taken for any safety related equipment which can shutdown the reactor, and is out of that fire zone.

3. Cables in a fire zone (with a fire) are expected to be totally inoperable. When any cable of a specific system or portion of a system is in a fire zone that system (or portion thereof) is declared inoperable.

3. Equipment Required for Safe Shutdown (Continued)

4. Fires are not expected to extend beyond any one fire zone.

5. A Loss of Coolant Accident is not postulated with the fire.

The tables which follow show the "Fire Zone" where the "Safe Shutdown Equipment and Cables" are located and "Backup Equipment" which is available in other fire zones. The Backup equipment list provides portions of systems and systems which will be operable, when the fire is in the zone indicated. (Eg. Reactor Building East, Core Spray I.V. 81-22 power would be inoperable but Core Spray IV 81-21 is operable.)

Station shutdown is achieved by inserting a strong negative reactivity into the core, causing it to be subcritical and providing a heat sink to remove decay heat. It is assumed that the control rods could scram or be manually inserted for any postulated fire. The control rods automatically insert upon loss of power or air and upon off normal operating conditions.

For any postulated fire of a control rod drive control cable, the method of cable failure could be an open circuit. Such a failure would induce a scram. Similarly, a cable failure which caused a short circuit would cause a protective device to function, also causing an open and a scram. Additionally, a fire which created other than scram system failures would, in most instances, cause an off normal condition (e.g. mainsteam isolation valve closure) which would create a scram. Or the control rod systems would be capable of manual scram or normal control rod insertion. These facts plus the low fire load in the Reactor Building would indicate that during any postulated fire the reactor could be brought subcritical with the control rod system.

The list of safe shutdown equipment and cables, including backup equipment, is provided below. It can be concluded from the list that a fire in any one area would not prevent safe shutdown. This would include:

a. placing the reactor in a subcritical condition and maintaining the reactor subcritical indefinitely, and

b. bringing the reactor to cold shutdown within 72 hours.

However both Diesel Generator Control Cables are routed in the same fire area or Turbine Building Elevation 261 feet. One set of control cables will be rerouted to ensure that the reactor can be shutdown during any postulated fire, with the loss of offsite power.

*FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	*BACKUP EQUIPMENT	COMMENTS
	CABLES:		SUMMARY - REACTOR BLDG.
Reactor Building (East)	Core Spray I.V. 81-22 Power	Core Spray IV 81-21	The Reactor Building is one fire area, and redundant equipment of all shutdown systems is represented within. However, as spelled out in the Fire Protection Program Submittal, low fire loading, physical separation, and proposed improvements will prevent a fire on one side of the north-south central line from involving the other side. Therefore, safe shutdown can be achieved.
	Core Spray I.V. 81-22 Control		
	Core Spray I.V. 40-06 Control	Manual Valve Operation	
	Core Spray I.V. 40-12 Control	Valve Locked Open	
	Core Spray I.V. 40-10 Power	Core Spray IV 40-11	
	Core Spray I.V. 40-10 Control		
	Core Spray I.V. 40-09 Power	Core Spray IV 40-11	
	Core Spray I.V. 40-09 Control		
	Core Spray I.V. 40-01 Power	Core Spray IV 40-11	
	Core Spray I.V. 40-01 Control		
	Core Spray I.V. 40-05 Power	Core Spray IV 40-06	
	Core Spray I.V. 40-05 Control		
	Core Spray I.V. 40-02 Power	Core Spray IV 40-12	
	Core Spray I.V. 40-02 Control	Valve Locked Open	
	Core Spray Pump 121 Power	Core Spray Pump 111	
	Core Spray Pump 122 Power	Core Spray Pump 111	
	Core Spray Topping Pump 121 Power	Core Spray Topping Pump 111	
	Core Spray Topping Pump 122 Power	Core Spray Topping Pump 111	
	Core Spray I.V. 81-01 Power	Core Spray IV 81-21	
	Core Spray I.V. 81-01 Control		

*NOTE: The Feedwater System would be operable without offsite power (115 KV) available. Also the station was separated into discrete fire zones similar to that described in the Nine Mile Point Unit 1 Fire Protection Program. The difference in this submittal is that T3 and T4 are now combined as the same fire zone.

Zone T1 is located in the Turbine Building Basement Elevation 250 feet west.
Zone T2 is located in the Turbine Building Basement Elevation 250 feet east.
Zone T3 (which includes T4) is located above 261 feet and includes the remainder of the Turbine Building.
Zone Reactor Building East - is located on the East side of the Reactor Building.
Zone Reactor Building West - is located on the West side of the Reactor Building.
Zone D.G. 102 - is the 102 Diesel Generator, Zone D.G. 103 is the 103 Diesel Generator, Zone 102 PB is 102 Power Board, Zone 103 PB is 103 Power Board.

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (East)	Core Spray I.V. 81-02 Power Core Spray I.V: 81-02 Control	Core Spray IV 81-21	
	Feedwater I.V. 31-04 Power Feedwater I.V. 31-04 Control	Feedwater IV 31-03	
	(Containment Spray Raw Water)		
	Containment B.V. 93-52 Power Containment B.V. 93-52 Control	Cont. Spray Raw Water BV 93-51	
	Containment B.V. 93-25 Power Containment B.V. 93-25 Control	Manual Valve Operation	
	Containment B.V. 93-27 Power Containment B.V. 93-27 Control	Cont. Spray Raw Water BV 93-25	
	Shutdown Cooling Pump 12 Control Shutdown Cooling I.V. 38-01 Control Shutdown Cooling B.V. 38-04 Power Shutdown Cooling B.V. 38-04 Control Shutdown Cooling I.V. 38-13 Control		Shutdown Cooling System Inoperable
	Emergency Condenser I.V. 39-08 Power Emergency Condenser I.V. 39-08 Control	Emergency Condenser IV 39-07 & IV 39-09	
	Emergency Condenser I.V. 39-10 Power Emergency Condenser I.V. 39-10 Control	Emergency Condenser IV 39-07 & IV 39-09	
	Emergency Condenser I.V. 39-06 Control	Emergency Condenser IV 39-05	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (East)	Auto. Depressurization I.V. NR108C, NR108D, NR108F Control	Auto. Depressurization IV NR108A, NR108B & NR108E	
	Control Rod Drive Pump 11 Power	Control Rod Drive Stored Energy System	
	Control Rod Drive Pump 12 Power Control Rod Drive Pump 12 Control Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Control		
	Liquid Poison Pump 11 Power Liquid Poison Pump 11 Control Liquid Poison Pump 12 Power Liquid Poison Pump 12 Control Liquid Poison E.V. NP05A Control Liquid Poison E.V. NP05B Control	Control Rod Drive Stored Energy System	Liquid Poison System Inoperable
	(Diesel Generator 103 Cooling Water) Diesel Generator Pump Power Diesel Generator Pump Control	Diesel Generator 102 Cooling Water Pump	
	(Diesel Generator 103 Starting Air) Diesel Compressors 1&2 Power Diesel Compressors 1&2 Control	Diesel Generator 102 Starting Air Compressors 1 & 2	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (East)	Diesel Generator 103 Fuel Oil System Power	Diesel Generator 102 Fuel Oil System	
	Equipment:		
	Core Spray IV 40-05	Core Spray IV 40-06	Manual Operation
	Core Spray IV 40-02	Valve Locked Open	Manual Operation
	Core Spray Pump 121	Core Spray Pump 111	
	Core Spray Pump 122	Core Spray Pump 111	
	Core Spray Topping Pump 121	Core Spray Topping Pump 111	
	Core Spray Topping Pump 122	Core Spray Topping Pump 111	
	Core Spray IV 81-01	Core Spray IV 81-21	
	Core Spray IV 81-02	Core Spray IV 81-21	
	(Containment Spray Raw Water)		Containment Spray Raw Water System Inoperable
	Containment BV 93-52		
	Containment BV 93-25		
	Containment BV 93-27		
	(Emergency Condensers)		
	Emergency IV 39-05	Emergency Condenser IV 89-07 & IV 39-09 & IV 39-05	
	Emergency IV 39-10		
	Control Rod Drive Pump 11	Control Rod Drive	
	Control Rod Drive Pump 12	Stored Energy System	
	Liquid Poison Pump 11		Liquid Poison System is Inoperable
	Liquid Poison Pump 12		
	Liquid Poison EVNP05A		
	Liquid Poison EVNP05B		

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (East)	Power Board 17 Power Board 171A Power Board 171B	Power Board 16 Power Board 161A Power Board 161B	Summary Reactor Bldg. East A fire in this area will not prevent safe shutdown. The following systems would be operable: 1/4 Core Spray 1/2 Feedwater CRD Stored Energy 102 Diesel Generator 1/2 Emergency Condenser 1/2 Containment Spray 1/2 Auto Depressurization

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
	CABLES:		
Reactor Building (West)	Core Spray Pump 111 Power	Core Spray Pump 122	
	Core Spray Pump 112 Power	Core Spray Pump 122	
	Core Spray Topping Pump 111 Power	Core Spray Topping Pump 122	
	Core Spray Topping Pump 112 Power	Core Spray Topping Pump 122	
	Core Spray I.V. 81-21 Power	Core Spray IV 81-02	
	Core Spray I.V. 81-21 Control		
	Core Spray I.V. 81-22 Power	Core Spray IV 81-02	
	Core Spray I.V. 81-22 Control		
	Core Spray I.V. 40-06 Power	Core Spray IV 40-05	
	Core Spray I.V. 40-06 Control		
	Core Spray I.V. 40-12 Power	Core Spray IV 40-02	
	Core Spray I.V. 40-12 Control	Valve Locked Open	
	Core Spray I.V. 40-11 Power	Core Spray IV 40-09	
	Core Spray I.V. 40-11 Control		
	Core Spray I.V. 40-01 Power	Core Spray IV 40-09	
	Core Spray I.V. 40-01 Control		
	Core Spray I.V. 81-01 Power	Core Spray IV 81-02	
	Core Spray I.V. 81-01 Control		
	Feedwater I.V. 31-03 Power	Feedwater IV 31-04	
	Feedwater I.V. 31-03 Control		

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (West)	(Containment Spray Raw Water)		
	Containment B.V. 93-51 Power	Cont. Spray Raw Water BV 93-52	
	Containment B.V. 93-51 Control		
	Containment B.V. 93-25 Power	Cont. Spray Raw Water BV 93-27	
	Containment B.V. 93-25 Control		
	Shutdown Cooling		
	Shutdown Cooling Pump 11 Power		Shutdown Cooling System Inoperable
	Shutdown Cooling Pump 11 Control		
	Shutdown Cooling Pump 12 Power		
	Shutdown Cooling Pump 13 Power		
	Shutdown Cooling Pump 13 Control		
	Shutdown Cooling I.V. 38-01 Power		
	Shutdown Cooling I.V. 38-01 Control		
	Shutdown Cooling I.V. 38-02 Power		
	Shutdown Cooling I.V. 38-02 Control		
	Shutdown Cooling B.V. 38-03 Power		
	Shutdown Cooling B.V. 38-03 Control		
	Shutdown Cooling B.V. 38-04 Power		
	Shutdown Cooling B.V. 38-04 Control		
	Shutdown Cooling FCV 38-09 Control		
	Shutdown Cooling FCV 38-10 Control		
	Shutdown Cooling FCV 38-11 Control		

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (West)	Shutdown Cooling		
	Shutdown Cooling B.V. 38-05 Power Shutdown Cooling B.V. 38-05 Control Shutdown Cooling I.V. 38-13 Power Shutdown Cooling I.V. 38-13 Control		
	Emergency Condenser		
	Emergency Condenser I.V. 39-07 Power Emergency Condenser I.V. 39-07 Control	Emergency Condenser IV 39-08 & IV 39-10	
	Emergency Condenser I.V. 39-09 Power Emergency Condenser I.V. 39-09 Control	Emergency Condenser IV 39-08 & IV 39-10	
	Emergency Condenser I.V. 39-05 Control	Emergency Condenser IV 39-06	
	Automatic Depressurization I.V. NR108A, NR108B, NR108E Control	Automatic Depressurization IV NR108C, IV NR108D, IV NR108F	
	Control Rod Drive Pump 11 Control	Control Rod Drive Stored Energy	
	Control Rod Drive B.V. NC-18 Power Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Power Control Rod Drive B.V. NC-40 Control		
	Liquid Poison Pump 11 Power Liquid Poison Pump 11 Control	Liquid Poison Pump 12	
	Liquid Poison E.V. NP05B Control	Liquid Poison EV NP05A	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (West)	(Diesel Generator 102 Cooling Water) Diesel Generator Pump Power Diesel Generator Pump Control	Diesel Generator 103 Cooling Water Pump	
	(Diesel Generator 102 Starting Air) Diesel Compressors 1&2 Power Diesel Compressors 1&2 Control Diesel Generator 102 Fuel Oil System Power	Diesel Generator 103 Starting Air Compressors 1&2 Diesel Generator Fuel Oil System	
	Equipment:		
	Core Spray Pump 111	Core Spray Pump 122	
	Core Spray Pump 112	Core Spray Pump 122	
	Core Spray Topping Pump 111	Core Spray Topping Pump 122	
	Core Spray Topping Pump 112	Core Spray Topping Pump 122	
	Core Spray IV 81-21	Core Spray IV 81-02	
	Core Spray IV 81-22	Core Spray IV 81-02	
	Core Spray IV 40-06	Core Spray IV 40-05	
	Core Spray IV 40-12	Core Spray IV 40-02 Valve Locked Open	
	(Containment Spray Raw Water) BV 93-51	Containment Spray Raw Water BV 93-52	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Reactor Building (West)	Shutdown Cooling Pump 11 Shutdown Cooling Pump 12 Shutdown Cooling Pump 13 Shutdown Cooling IV 38-01 Shutdown Cooling IV 38-02 Shutdown Cooling BV 38-03 Shutdown Cooling BV 38-04 Shutdown Cooling BV 38-05 Shutdown Cooling FCV 38-09 Shutdown Cooling FCV 38-10 Shutdown Cooling FCV 38-11		Shutdown Cooling System Inoperable
	Emergency Condenser IV 39-07 Emergency Condenser IV 39-09 Emergency Condenser IV 39-05	Emergency Condenser IV 39-08 IV 39-10, IV 39-06	<u>Summary Reactor Bldg. West</u> Power Board 167 is to be isolated from both East & West Reactor Building areas by flame retardant materials on cables to reduce fire loading and a fire barrier between power board 167 and power board 17. A fire in this area will not prevent safe shutdown. The following systems will remain operable: Control Rod Drive Stored Energy 1/2 Liquid Poison Diesel Generator 103 1/2 Emergency Condenser 1/4 Core Spray 1/2 Feedwater 1/2 Containment Spray Raw Water 1/2 Auto Depressurization
	Control Rod Drive System Control Rod Drive BV NC-18 Control Rod Drive BV NC-40	Control Rod Drive Stored Energy	
	Power Board 16 Power Board 161A Power Board 161B Power Board 167	Power Board 17 Power Board 171A Power Board 171B Power Board 167	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T1	No Equipment in this area.		
	Cables:		
	Core Spray Pump 111 Power	Core Spray Pump 112 or 122	
	Core Spray Topping Pump 111 Power	Core Spray Topping Pump 112 or 122	
	Core Spray I.V. 81-21 Control	Core Spray IV 81-22	
	Core Spray I.V. 40-11 Control	Core Spray IV 40-10	
	Core Spray I.V. 40-01 Control	Core Spray IV 40-09	
	Core Spray I.V. 81-01 Control	Core Spray IV 81-02	
	Feedwater Pump 11 Power		Feedwater System Inoperable
	Feedwater Pump 12 Power		
	Feedwater Booster Pump 11 Power		
	Feedwater Booster Pump 12 Power		
	Feedwater Booster Pump 13 Power		
	Feedwater Condensate Pump 11 Power		
	Feedwater Condensate Pump 12 Power		
	Feedwater Condensate Pump 13 Power		
	Feedwater IV 31-03 Control		
	Feedwater IV 31-04 Control		
	Containment Spray Raw Water BV 93-25 Control	Containment Spray Raw Water BV 93-27	
	Shutdown Cooling Pump 11 Control	Shutdown Cooling Pump 12	
	Shutdown Cooling Pump 13 Control	Shutdown Cooling Pump 12	
	Shutdown Cooling BV 38-03 Control	Shutdown Cooling BV 38-04	
	Shutdown Cooling BV 38-05 Control	Shutdown Cooling BV 38-04	
	Emergency Condenser IV 39-09	Emergency Condenser IV 39-10 & IV 39-08	
	Emergency Condenser IV 39-05	Emergency Condenser IV 39-06	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
TI	Auto Depressurization I.V. NR-108A, NR-108B, NR-108E Control	Auto Depressurization IV NR-108C, NR-108D, NR-108F	
	Control Rod Drive Pump 11 Control	Control Rod Drive Pump 12	<u>Summary T1 (Turbine Bldg.)</u>
	Liquid Poison Pump 11 Control	Liquid Poison Pump 12	A fire in this area will not prevent safe shutdown. The following systems are operable: 1/2 Core Spray 1/2 Containment Spray Raw Water 1/3 Shutdown Cooling 1/2 Emergency Condenser 1/2 Auto. Depressurization 1 Control Rod Drive Pump 1/2 Liquid Poison

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T2	No Equipment in this area.		
	Cables:		
	Core Spray Pump 111 Power	Core Spray Pump 121	
	Core Spray Pump 112 Control	Core Spray Pump 121	
	Core Spray Topping Pump 111 Power	Core Spray Topping Pump 121	
	Core Spray Topping Pump 112 Control	Core Spray Topping Pump 121	
	Core Spray IV 81-22 Control	Core Spray IV 81-01	
	Core Spray IV 40-10 Control	Core Spray IV 40-01	
	Core Spray IV 40-09 Control	Core Spray IV 40-01	
	Core Spray Topping Pump 122 Control	Core Spray Topping Pump 121	
	Core Spray IV 81-02 Control	Core Spray IV 81-01	
	Feedwater Pump 12 Power	Feedwater Pump 11	
	Feedwater Booster Pump 13 Power	Feedwater Booster Pump 11 or 12	
	Feedwater Condensate Pump 12 Power	Feedwater Condensate Pump 11	
	Feedwater Condensate Pump 13 Power	Feedwater Condensate Pump 11	
	Feedwater I.V. 31-04 Control	Feedwater IV 31-03	
	(Containment Spray Raw Water)		Containment Spray Raw Water System Inoperable
	Containment Spray Pump 111 Power		
	Containment Spray Pump 122 Power		
	Containment Spray Pump 122 Control		
	Shutdown Cooling Pump 12 Control	Shutdown Cooling Pump 11 & 13	
	Emergency Condenser I.V. 39-10 Control	Emergency Condenser IV 39-07 & IV 39-09	
	Emergency Condenser I.V. 39-06 Control	Emergency Condenser IV 39-05	
	Auto Depressurization I.V. NR108C, NR108D, NR108F Control	Auto Depressurization IV NR108A, NR108B, NR108E	
	Control Rod Drive Pump 12 Control	Control Rod Drive Pump 11	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T2	Liquid Poison Pump 12 Control	Liquid Poison Pump 11	Summary T2 (Turbine Bldg.) A fire in this area will not prevent safe shutdown. The following systems will remain operable: 1/4 Core Spray 1/2 Feedwater 2/3 Shutdown Cooling 1/2 Emergency Condenser 1/2 Auto Depressurization CRD Stored Energy 1/2 Liquid Poison Diesel Generator 102
	Diesel Generator 102 Cooling Water Pump Power	Station Fire Pumps via proposed tie between Diesel Generator Cooling System and Fire Protection Systems	
	(Diesel Generators 103)		
	Control Cab. Control Control Cab. Power	Diesel Generator 102	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T3	Cables:		
	Core Spray I.V. 40-05 Control	Core Spray IV 40-06	
	Core Spray I.V. 40-02 Control	Valve Locked Open	
	Core Spray I.V. 40-06 Control	Manual Valve Control	
	Core Spray I.V. 40-12 Control	Valve Locked Open	
	Core Spray Topping Pump 121 Control	Core Spray Topping Pump 111 or 112	
	Feedwater Pump 11 Power		Feedwater System Inoperable
	Feedwater Pump 11 Control		
	Feedwater Pump 12 Power		
	Feedwater Pump 12 Control		
	Feedwater Booster Pump 11 Power		
	Feedwater Booster Pump 11 Control		
	Feedwater Booster Pump 12 Power		
	Feedwater Booster Pump 12 Control		
	Feedwater Booster Pump 13 Power		
	Feedwater Booster Pump 13 Control		
	Feedwater Condensate Pump 11 Power		
	Feedwater Condensate Pump 11 Control		
	Feedwater Condensate Pump 12 Power		
	Feedwater Condensate Pump 12 Control		
	Feedwater Condensate Pump 13 Power		
	Feedwater Condensate Pump 13 Control		
	Feedwater B.V. 29-09 Power		
	Feedwater B.V. 29-09 Control		
	Feedwater B.V. 29-08 Power		
	Feedwater B.V. 29-08 Control		
	Feedwater I.V. 31-03 Power		
	Feedwater I.V. 31-03 Control		

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T3	Feedwater I.V. 31-04 Power		
	Feedwater I.V. 31-04 Control		
	Feedwater FCV ID12A Control		
	Feedwater FCV ID12B Control		
	(Containment Spray Raw Water)	(Containment Spray Raw Water)	
	Containment Pump 111 Control	Containment Pump 122	
	Containment B.V. 93-51 Control	Containment Spray Raw Water BV 93-52	
	Containment B.V. 93-52 Control	Manual Valve Control	
	Containment B.V. 93-25 Control	Containment Spray Raw Water BV 93-27	
	Containment B.V. 93-27 Control	Manual Valve Control	
	Shutdown Cooling I.V. 38-01 Control		Shutdown Cooling System Inoperable
	Shutdown Cooling I.V. 38-02 Power		
	Shutdown Cooling I.V. 38-02 Control		
	Shutdown Cooling B.V. 38-04 Control		
	Shutdown Cooling I.V. 38-13 Control		
	Shutdown Cooling FCV 38-09 Control		
	Shutdown Cooling FCV 38-10 Control		
	Shutdown Cooling FCV 38-11 Control		
	Emergency Condenser I.V. 39-07 Power	Manual Valve Operation	
	Emergency Condenser I.V. 39-07 Control		
	Emergency Condenser I.V. 39-08 Power	Manual Valve Operation	
	Emergency Condenser I.V. 39-08 Control		
	Emergency Condenser I.V. 39-05	Manual Valve Operation	
	Emergency Condenser I.V. 39-06	Manual Valve Operation	
	Control Rod Drive B.V. NC-18 Control	Control Rod Drive Stored Energy System	
	Control Rod Drive B.V. NC-40 Control		
	Liquid Poison E.V. NP05A Control		Liquid Poison System Inoperable
	Liquid Poison E.V. NP05B Control		

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
T3	(Diesel Generators 102 Cooling Water) Diesel Generators 102 Power Diesel Generators 102 Control Diesel Generators 103 Cooling Water Diesel Generators 103 Power Diesel Generators 103 Control		Cables for either Diesel Generator 102 or 103 will be rerouted to assure the availability of one Diesel Generator.
	(Diesel Generators Starting Air) Diesel Generator Compressors 1&2 (102) Power Diesel Generator Compressors 1&2 (103) Power		
	(Diesel Generators Fuel Oil) Diesel Generator Diesel 103 Control Cab. Control Diesel Generator Diesel 103 Control Cab. Power Diesel Generator Immersion Heater 103 Power Diesel Generator Immersion Heater 102 Power Diesel Generator Diesel 102 Control Cab. Control Diesel Generator Diesel 102 Control Cab. Power		
	<u>Equipment</u>:		
	Feedwater Pump 11 Feedwater Pump 12 Feedwater Booster Pump 11 Feedwater Booster Pump 12 Feedwater Booster Pump 13 Feedwater Condensate Pump 11 Feedwater Condensate Pump 12 Feedwater Condensate Pump 13		Feedwater System Inoperable

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
			SUMMARY T3 (Turbine Building)
T3	Feedwater BV 29-09 Feedwater BV 29-08 Feedwater IV 31-03 Feedwater IV 31-04 Feedwater FCV ID12A Feedwater FCV ID12B		A fire in this area will not prevent safe shutdown. The following systems will remain operable: 1/2 Core Spray 1/2 Containment Spray Raw Water Emergency Condenser CRD Stored Energy One diesel will be operable.

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
	CABLES:		
D.G. 102	Core Spray Pump 111 Control	Core Spray Pump 112	
	Core Spray Topping Pump 111 Control	Core Spray Topping Pump 112	
	Core Spray I.V. 40-05 Control	Manual Valve Control	
	Core Spray I.V. 40-02 Control	Valve Locked Open	
	Core Spray Pump 121 Control	Core Spray Pump 112	
	Core Spray Topping 121 Control	Core Spray Topping Pump 112	
	(Containment Spray Raw Water) Containment Pump 111 Control	Containment Spray Raw Water Pump 122	
	Containment B.V. 93-27 Control	Local Manual Control	
	Shutdown Cooling I.V. 38-01 Control		Shutdown Cooling System Inoperable
	Shutdown Cooling I.V. 38-04 Control		
	Shutdown Cooling I.V. 38-13 Control		
	Emergency Condenser I.V. 39-06 Control	Emergency Condenser I.V. 39-05	
	Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Control	Control Rod Drive Stored Energy System	
	Liquid Poison E.V. NP05A Control	Liquid Poison E.V. NP05B	
	Diesel Generator 102 Cooling Water Pump Control	Diesel Generator 103 Cooling Water Pump	
	Diesel Generator 102 Starting Air Compressors 1&2 Power	Diesel Generator 103 Starting Air Compressors 1&2	
	Diesel Generator 102 Fuel Oil System Power	Diesel Generator 103 Fuel Oil System	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
			SUMMARY - D.G. 102
D.G. 102	(Diesel Generator 102) Control Cab. Control Control Cab. Power	Diesel Generator 103 Control Cabinet	A fire in this area will not prevent safe shutdown. The following systems will be operable:
	Equipment:		1/2 Core Spray Feedwater
	(Diesel Generator 102) Diesel Starting Air Compressor Diesel Fuel Oil Pump	Diesel Generator 103 Starting Air Compressors 1&2 Diesel Generator 103 Fuel Oil Pump	1/2 Containment Spray Raw Water Control Rod Drive Stored Energy 1/2 Liquid Poison Diesel Generator 103

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
	CABLES:		
D.G. 103	Core Spray Pump 112 Control Core Spray Topping Pump 112 Control Core Spray I.V. 40-06 Control Core Spray I.V. 40-12 Control Core Spray Pump 112 Control Core Spray Topping Pump 112 Control	Core Spray Pump 111 Core Spray Topping Pump 111 Manual Valve Control Valve Locked Open Core Spray Pump 111 Core Spray Topping Pump 111	
	(Containment Spray Raw Water) Containment Pump 112 Control Containment B.V. 93-25 Control	Containment Spray Raw Water Pump 111	
	Shutdown Cooling I.V. 38-01 Control Shutdown Cooling B.V. 38-04 Control Shutdown Cooling I.V. 38-13 Control	Local Manual Control	Shutdown Cooling System Inoperable
	Emergency Condenser I.V. 39-05 Control	Emergency Condenser IV 39-06 Control	
	Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Control	Control Rod Drive Stored Energy System	
	Liquid Poison E.V. NP05A Control	Liquid Poison E.V. NP05B	
	Diesel Generator 103 Cooling Water Pump Control	Diesel Generator 102 Cooling Water Pump	
	Diesel Generator 103 Starting Air Compressors 1&2 Power	Diesel Generator 103 Starting Air Compressors 1&2	
	Diesel Generator 103 Fuel Oil Control Cab. Control	Diesel Generator 102 Fuel Oil System	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
	CABLES:		SUMMARY - D.G. 102 P.B.
102 P.B.	Core Spray Pump 111 Power Core Spray Pump 111 Control Core Spray Topping Pump 111 Power Core Spray Topping Pump 111 Control Core Spray I.V. 40-05 Control Core Spray I.V. 40-02 Control Core Spray Pump 121 Power Core Spray Pump 121 Control Core Spray Topping Pump 121 Power Core Spray Topping Pump 121 Control	Same backup equipment as D.G. 102	A fire in this area will not prevent safe shutdown. The following systems will be operable: 1/2 Core Spray Feedwater 1/2 Containment Spray Raw Water Control Rod Drive Stored Energy 1/2 Liquid Poison Diesel Generator 103
	(Containment Spray Raw Water) Containment Pump 122 Power Containment Pump 122 Control Containment B.V. 93-27 Control		
	Shutdown Cooling I.V. 38-01 Control Shutdown Cooling B.V. 38-04 Control Shutdown Cooling I.V. 38-13 Control		
	Emergency Condenser I.V. 39-06 Control		
	Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Control		
	Liquid Poison E.V. NP05A Control		
	EQUIPMENT:		
	P.B. 102	P.B. 103	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
D.G. 103	(Diesel Generator 103 Fuel Oil) Diesel Generator Control Cab. Power Diesel Generator Fuel Oil System Power Diesel Generator 102 Fuel Oil Control Cab. Control Diesel Generator 102 Fuel Oil Control Cab. Power		SUMMARY D.G. 103 These cables are protected by a missile barrier, fire retardant coating, and CO_2 fire protection.
	EQUIPMENT: (Diesel Generator 103) Diesel Starting Air Compressor Diesel Fuel Oil Pumps	Diesel Generator 102 Starting Air Compressors 1&2 Fuel Oil Pump	A fire in this area will not prevent safe shutdown. The following systems will be operable: 1/2 Core Spray Feedwater 1/2 Containment Spray Raw Water Control Rod Drive Stored Energy 1/2 Liquid Poison Diesel Generator 102

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
	CABLES:		SUMMARY D.G. 103 P.B.
103 P.B.	Core Spray Pump 112 Control Core Spray Topping Pump 112 Control Core Spray I.V. 40-05 Control Core Spray I.V. 40-02 Control Core Spray Pump 122 Control Core Spray Topping Pump 122 Power Core Spray Topping Pump 122 Control (Containment Spray Raw Water) Containment Pump 122 Power Containment Pump 122 Control Containment B.V. 93-27 Control Shutdown Cooling I.V. 38-01 Control Shutdown Cooling B.V. 38-04 Control Shutdown Cooling I.V. 38-13 Control Emergency Condenser I.V. 39-05 Control Control Rod Drive B.V. NC-18 Control Control Rod Drive B.V. NC-40 Control Liquid Poison E.V. NP05A Control	Same backup equipment as D.G. 103	A fire in this area will not prevent safe shutdown. The following systems will be operable: 1/2 Core Spray Feedwater 1/2 Containment Spray Raw Water Control Rod Drive Stored Energy 1/2 Liquid Poison Diesel Generator 102
	EQUIPMENT:		
	P.B. 103	P.B. 102	

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Cable Spreading Room	No Equipment in this area		
	CABLES:		
	Core Spray Pump 112 Control Core Spray Topping Pump 112 Control Core Spray I.V. 81-21 Control Core Spray I.V. 81-22 Control Core Spray I.V. 40-11 Control Core Spray I.V. 40-10 Control Core Spray I.V. 40-09 Control Core Spray I.V. 40-01 Control	Core Spray Pump 111 Core Spray Topping Pump 111 Manual Valve Operation Core Spray IV 81-21	Core Spray System Inoperable
	Core Spray Pump 122 Control Core Spray Topping Pump 122 Control Core Spray I.V. 81-01 Control Core Spray I.V. 81-02 Control	Core Spray Pump 121 Core Spray Topping Pump 121 Manual Valve Operation Manual Valve Operation	
	Feedwater Pump 12 Power Feedwater Booster Pump 13 Power Feedwater Condensate Pump 12 Power Feedwater Condensate Pump 13 Power Feedwater I.V. 31-03 Control Feedwater I.V. 31-04 Control	Feedwater Pump 11 Feedwater Booster Pump 11 & 13 Feedwater Condensate Pump 11 Feedwater Condensate Pump 11 Manual Valve Operation of IV 31-03 or IV 31-04	
	Containment Spray Raw Water Pump 122 Control	Containment Spray Raw Water Pump 111	
	Shutdown Cooling Pump 11 Control Shutdown Cooling Pump 12 Control Shutdown Cooling Pump 13 Control Shutdown Cooling B.V. 38-03 Control Shutdown Cooling B.V. 38-05 Control		Shutdown Cooling System Inoperable

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Cable Spreading Room	Emergency Condenser I.V. 39-09 Control Emergency Condenser I.V. 39-10 Control Emergency Condenser I.V. 39-05 Emergency Condenser I.V. 39-06	Manual Valve Control of IV 39-09, IV 39-10 IV 39-06 and 39-05	
	Automatic Depressurization I.V. NR108A, NR108B, NR108E Control Automatic Depressurization I.V. NR108C, NR108D, NR108F Control		Auto Depressurization System Inoperable
	Control Rod Drive Pump 11 Control Control Rod Drive Pump 12 Control	Control Rod Drive Stored Energy System	
	Liquid Poison Pump 11 Control Liquid Poison Pump 12 Control		Liquid Poison System Inoperable

SUMMARY CABLE SPREADING

A fire in this area would not prevent safe shutdown. The control rod drive, emergency cooling, and feedwater systems would remain operable.

FIRE ZONE	SAFE SHUTDOWN EQUIPMENT & CABLES	BACKUP EQUIPMENT	COMMENTS
Aux. Control Room & Control Room	All control of shutdown systems is represented in the Control/Auxiliary Control Room Complex. If the Control Complex were to be rendered inoperable by a fire, the plant would be shut down using existing operating procedures. That is, operator action outside the control room.		

QUESTION:

4. Fire Induced Spurious Equipment Operation

Identify any equipment required for safe shutdown (see item 3 above) that is subject to spurious operation as a result of a fire. Particular attention is directed to valves and valve position indicators. Discuss the effects on safe shutdown of such spurious operation.

RESPONSE:

Control and indicating light circuits for pumps and valves are wired by means of multiple conductor cables, making spurious operations possible as a result of fire. In the event of a fire, equipment with cables in the affected area would be considered unreliable and backup equipment would be used for safe shutdown.

The list accompanying question 3 encompasses safe shutdown equipment that could be subject to spurious operations, and the backup equipment available for safe shutdown.

QUESTION:

5. Instrument and Station Air System

Describe the function of the instrument and station air system in achieving and maintaining both hot shutdown and cold shutdown conditions. Identify any fire areas which contain components or piping of the air system and air operated valves whose position must change for shutdown. Verify that the loss of the air system will not prevent shutdown operations.

RESPONSE:

The loss of instrument air is discussed on pages V-4 through V-7 of the second supplement to the Final Safety Analysis Report dated October 1968. These pages discuss the various system valves, their mode of operation and the consequences of loss of instrument air. The loss of service air is discussed on pages 11 through 14 of the fourth supplement to the Final Safety Analysis Report dated November 1968. Both the above responses indicate that the station can be safely shutdown without service and instrument air.

QUESTION:

6. Safe Shutdown Systems-Valves

a. Provide a list of remotely-operated valves, with their fail positions, in safe shutdown systems identified in item 3 above.

b. Describe the provision and accessibility to manually operate these valves, if necessary, during the shutdown operations following fires which prevent remote operation of the valves.

RESPONSE:

A list of remotely operated safety related valves, including the failure mode, are identified in Table 6. All of these valves are accessible for manual operation. Some valves are located in high radiation areas, but are accessible during the time to complete manual operation. However, if certain valves were adjacent to a fire, they could become inaccessible. Should this occur, appropriate backup equipment could be utilized to safely shut down the reactor. This is discussed in Response 3.

TABLE 6

FIRE AREA	VALVE	FAIL POSITION
Reactor Building East	Core Spray	
	I.V. 40-05	As is
	I.V. 40-02	As is
	I.V. 81-01	As is
	I.V. 81-02	As is
	Containment Spray Raw Water	
	B.V. 93-25	As is
	B.V. 93-27	As is
	B.V. 93-52	
	Emérgency Condensers	
	I.V. 39-08	As is
	I.V. 39-10	As is
	I.V. 39-06	Open
	Liquid Poison	
	E.V.NP05A	As is
	E.V.NP05B	As is

NOTE: Isolation valves located in drywell are not listed because of their inaccessibility for manual operation.

TABLE 6

FIRE AREA	VALVE	FAIL POSITION
Reactor Building West	Core Spray	
	I.V. 81-21	As is
	I.V. 81-22	As is
	I.V. 40-06	As is
	I.V. 40-12	As is
	Containment Spray Raw Water	
	B.V. 93-51	As is
	Shutdown Cooling	
	I.V. 38-01	As is
	I.V. 38-02	As is
	B.V. 38-03	As is
	B.V. 38-04	As is
	B.V. 38-05	As is
	ECV 38-09	Closed
	ECV 38-10	Closed
	ECV 38-11	Closed
	Emergency Condenser	
	I.V. 39-07	As is
	I.V. 39-09	As is
	I.V. 39-05	Open
	Control Rod Drive	
	B.V. NC-18	As is
	B.V. NC-40	As is

FIRE AREA	VALVE	FAIL POSITION
T3	Feedwater	
	B.V. 29-09	As is
	B.V. 29-08	As is
	I.V. 31-03	As is
	I.V. 31-04	As is
	FCV ID12A	As is

QUESTION:

7. Failure Analysis

Provide a failure analysis which verifies that a single failure, other than a failure of the fire main discharge header, does not impair the primary and backup fire suppression capabilities. The analysis should include consideration of failures in the suppression system, the fire detection system or the power sources for such systems.

RESPONSE:

Presently, two fire pumps are installed, one electric and one diesel fire pump. Each pump can supply 100 percent flow requirements. The fire pumps will start simultaneously (automatically) upon pressure drop in the fire main system. Both of these pumps may be manually started. The diesel fire pump is separated from the electric fire pump by a fire resistant enclosure.

The diesel driven fire pump is capable of operation in the event of total loss of station power. The diesel engine starting panel is energized by the station batteries for added reliability. The diesel engine is started by an air motor. A modification will be incorporated so that the diesel is actuated automatically should D.C. power to the starting panel be interrupted.

Provision has been made to connect the municipal potable water supply through a fire hose to the fire main system in the event both fire pumps are out of service. Eventually, completion of the fire system for Nine Mile Unit 2 and its connection to Unit 1 will offer further redundancy in the fire suppression system.

The interior sprinkler systems are supplied from the fire main system. In the event that the sprinkler system fails, interior standpipe hose connections are so located as to permit coverage of all portions of the building with 100 foot lengths of hose.

The exterior spray system protecting the transformers and hydrogen racks are open deluge type and fully automatic. Actuation is by means of rate of rise pneumatic systems located over the equipment and connected to the deluge valves. In the event the exterior spray system fails, hoses are provided for the nearby hydrants which are spaced to permit coverage of the equipment with a hose line not exceeding 200 feet in length.

7. Failure Analysis (Continued)

The foam-water protection is divided into multiple systems to afford flexibility in fire attack and to limit the total water demand required. Water supply is from the header located in the foam room which is connected to the fire main system through two separate connections.

Foam injection equipment located in the foam room consists of two foam solution tanks, one in service and the other as a connected reserve, with sufficient capacity to provide a minimum 10 minute supply for the largest number of foam-water sprinkler systems expected to operate on a single fire. Sufficient foam solution is provided to establish an adequate foam blanket over the entire hotwell pit. Two foam solution pumps for the systems are provided, one A.C. powered, and the other D.C. powered from the station battery. Injection into the system risers is through metering orifices on the foam solution lines.

Auxiliary foam producing capability is provided by eighteen standpipe hose connections located in the vicinity of the turbo-generator unit. Foam solution is piped to each hose station from the foam room. Solution is provided by two small pumps, (one A.C. and one D.C. powered) actuated by a pressure drop in the solution line. The hose line solution pumps take suction from the reserve solution tank to guarantee supply in the event the primary tank is exhausted through the foam-water sprinkler system.

A low pressure carbon dioxide system is installed for certain areas. This system is backed up by hose stations located in the vicinity.

A rupture in any standpipe riser would not be detrimental due to the fact that hoses from other standpipes could be used to make up for those hoses which would not be operational. All areas of the building are covered by at least two hose stations with a maximum of 200 feet of hose. These standpipes have independent connections to the main header loop.

The 10 inch main header loop is provided with section valves so that one section of the loop may be taken out of service while the remaining loop is operational.

If the 10 inch header on the east side of the turbine ruptured and had to be taken out of service, there would be no water supply to the diesel Generating Room on elevation 261 feet and areas on elevation 250 feet east of off-gas tunnel. This situation is currently being evaluated.

In the event the south, north or west section of 10 inch header loop was out of operation, backup hose stations supplied from alternate sections of loop would be used for protection.

Therefore, single failures can be accommodated except as discussed above without loss of primary and backup fire protection.

7. Failure Analysis (Continued)

Power for the fire detector systems is provided from an A.C. uninterruptible power supply or the Station battery (D.C.) supply. The power supply is not subject to single failures. The signaling system is designed in accordance with NFPA 72D Class B.

QUESTION:

8. Lightning Effects

Describe the means provided to prevent lightning from initiating fires which could damage safety-related equipment. Describe the means provided to prevent lightning from damaging the fire protection system.

RESPONSE:

The Nine Mile Point Unit #1 station has an integral ground grid system. Building steel is bonded to this ground grid. The 310 feet stack has ground rods running the entire length of the stack to the ground grid. The most likely path of lightning on the site is through the stack ground rods. In the event of lightning strikes to the building steel, discharge would occur through building steel to the site ground grid. Since lightning strikes are expected to be discharged through the building steel to the site ground grid, the fire protection system would not be effected.

QUESTION:

9. Effects of Extinguishing Agents

Provide the results of an analysis which shows that rupture or inadvertent operation of a fire fighting system will not subsequently cause damage or failure of safety-related equipment required for safe shutdown.

RESPONSE:

Rupture or inadvertent operation of a fire fighting system will not cause damage or failure of safety-related equipment required for safe shutdown. Power boards do not have any sprinklers run above them. There are no safety-related power boards which would be affected by rupture of any fire water piping. All power boards have drip proof enclosures. Other equipment that might be hit by sprinklers include pumps and compressors whose operation should not be affected. Most electrical equipment are located in drip proof enclosures. These would include the Control Rod Drive Equipment, Reactor Feedwater Pumps, Reactor Feedwater Booster Pumps and the Instrument Air Compressors. None of this equipment is directly under the sprinklers.

QUESTION:

10. Safety-related Systems Interlocked with Firefighting Systems

Identify any safety-related systems or their auxiliaries which are interlocked to and could be disabled by operation of a firefighting system.

RESPONSE:

There are no safety-related systems interlocked with firefighting systems at Nine Mile Point Unit #1.

QUESTION:

11. Fire Brigade Equipment

Describe the equipment provided for the fire brigade. Describe means that will be used to either override door locking mechanisms or breach a barrier to provide fire brigade access and personnel egress in the event of a locking mechanism failure. Describe the training and tools provided for this purpose.

RESPONSE:

The following equipment is provided for the fire brigade in cabinets located at each of the following locations:

1. Turbine Building entrance - elevation 261 feet
2. Reactor Building entrance - elevation 261 feet
3. Off-Gas Building entrance - elevation 261 feet

Each area has three cabinets:

Cabinet 1

1. Scott Pak II - 1
2. Scott Pak II - 1
3. Spare Air Cylinder - 1
4. Spare Air Cylinder - 1
5. Coveralls - 2 pair
6. Cotton Hoods - 2
7. Rubber gloves - 2 pair
8. Rubber gloves - 2 pair
9. Raincoats - 2
10. Raincoats - 2
11. Fire Axe - 1
12. Wrecking Bar - 1
13. Portable hand light - 5/cabinet
14. Fire Resistant gloves - 2 pair
15. Fire Resistant suits - 2
16. Fire Resistant hoods - 2
17. Asbestos tarps - 2
18. Canvas tarps - 2
19. Extension cord - 1
20. Hard hats - 2
21. Forcible Entry - 1

Cabinet 2

1. White turn-out coat - 1
2. Yellow turn-out coats - 6
3. Firefighter gloves - 6 pair
4. Shoulder harness belts - 2
5. Life lines - 100' - 2
6. Boots 6 pair

11. Fire Brigade Equipment (Continued)

Cabinet 3

1. Scott Air Packs - 5
2. Spare Scott Air Pack Bottles - 10

In addition to the above, the following minimum amounts of equipment are available to the brigade in the Rescue Cabinet located in the Maintenance Shop:

1. Wrecking Bars - 2
2. Boltcutter - 1
3. Hacksaw - 2
4. Burning Torch - 1
5. Come-along - 1
6. Cable Sling, 3' - 1
7. Cable Sling, 6' - 1
8. Hydraulic Jack, 1 ton - 1
9. Hydraulic Jack, 5 ton - 1
10. Sledgehammer, 6# - 1
11. Sledgehammer, 12# - 1
12. Rope 1/2" x 100' - 2
13. Life lines 100' - 2
14. Forcible Entry Tool - 1

If there is a fire, the locked door mechanisms may become inoperable. Every member of the brigade is provided with a set of keys to open doors. The brigade will also have access to "Forcible Entry Tools."

All members of the brigade will be trained in the use of all fire-fighting equipment, including forcible entry tools. The training progam is available for review.

QUESTION:

12. Shared Emergency Equipment

List the emergency equipment that is shared or proposed to be used by both the fire brigade and the security team.

RESPONSE:

Since members of the Security force are part of the fire brigade, they may utilize the available fire brigade equipment when necessary as part of their fire brigade duties. Fire Protection equipment is only utilized for Fire Protection purposes.

QUESTION:

13. Supplemental Fire Department

Describe the procedures and required authorization for entry, command and supervision of offsite fire department.

RESPONSE:

Agreements have been reached with the following offsite fire departments.

1. Alcan Fire Department
2. City of Oswego Fire Department
3. New Haven Volunteer Fire Department
4. Scriba Volunteer Fire Department

The procedures for entry, command and supervision are described in Emergency Plan Implementing Procedure #2. This procedure details the program for the method of Notification of a fire, actions to be taken, and the appropriate personnel response.

QUESTION:

14. Fire Brigade Organization Chart

Provide an organizational chart of the fire brigade for each shift which shows the brigade size, composition and chain of command and which designates the normal duty position of the brigade leader, i.e., operator, electrician, maintenance man, etc.

RESPONSE:

The Fire Brigade at Nine Mile Point Unit #1 is as follows:

Normal Brigade

1 - Nuclear Oper. "E" - Captain
1 - Auxiliary Oper. "B"
1 - Auxiliary Oper. "B"
1 - Security Guard
1 - Security Guard

The Normal fire brigade is available 24 hours a day seven days each week. The Nuclear Operator E holds a Reactor Operating License.

QUESTION:

15. Fire Brigade Physical Examination

Confirm that all fire brigade members are provided with a periodic physical examination to screen out personnel with heart or respiratory disorders, or provide justification for any exceptions.

RESPONSE:

A physical examination for fire brigade members is given periodically in accordance with Regulatory Guide 8.15. The Regulatory Guide requires that individuals are physically able to perform work and use respiratory protective equipment as determined by a physician. All fire brigade members have passed this examination.

QUESTION:

16. Fire Drills

Confirm that the assessment of fire drills include subsections 3.0a, 3.0b, 3.0d and 3.0f of Attachment No. 2 to "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance", or provide justification for any exceptions.

RESPONSE:

Nine Mile Point Unit #1 complies with these guidelines.

QUESTION:

17. Firefighting Procedures

Confirm that the following have been done or provide justification for any exceptions:

1. Firefighting procedures are documented and include strategies established for fighting fires in all safety-related and areas presenting a hazard to safety-related equipment; and

2. Firefighting strategies include the requirements of subsections d(1) through d(10) of Attachment No. 5 to "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance."

RESPONSE:

Nine Mile Point Unit #1 does not plan to implement all of the procedures discussed in Items d(1) to (d)10 of Attachment No. 5 to Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance." Alternative methods will be utilized to fulfill this guideline.

Combustibles have generally been identified and firefighting procedures will be developed for specific hazards. In addition, for critical safety related equipment or radiation contamination hazards, procedures will be developed.

Niagara Mohawk relies on the training of fire brigade members at the Fire Training School and classroom instruction to ensure firefighting capability. Additionally, station operators are used as fire brigade members. This provides a significant advantage during a postulated fire because of their knowledge of plant areas, equipment and systems. Also, our letter dated April 10, 1978, to Mr. Lear discussed Unit 1 compliance to items d(1) through d(10) of Attachment (5) discussed above.

QUESTION:

18. Removal from Service Procedure

Provide a summary of the procedures established to control the disarming of any automatic or manually actuated fire protection system. Identify the management position responsible for authorizing the disarmament and the means used to assure the system is returned to normal.

RESPONSE:

Site Administrative Procedure #APN7 sets forth the procedure for the control of equipment as necessary to maintain reactor and personnel safety and to avoid unauthorized operation of equipment.

This procedure by reference includes Section 9 of the Niagara Mohawk Power Corporation Accident Prevention Rules pertaining to the Mark-Up of Systems and Equipment. A Mark-Up means the permission given by the controller to the Mark-Up man to begin work after taking all necessary precautions. For all plant systems, the controller referred to in the Mark-Up Procedures shall be the Chief Shift Operator. He shall maintain the Mark-Up sheets and direct other operators in the placement of tags. Thereafter it continues to exist until the Mark-Up man marks clear.

Whenever work or tests are to be performed on plant operating systems the Shift Supervisor will be consulted and the Chief Shift Operator must be informed.

If the test requires attachment of test instrumentation or operation of installed instrumentation, all manipulations will be performed by or with the knowledge and permission of the Chief Shift Operator or a Licensed Operator assigned by the Shift Supervisor. If the work or tests are such that a Mark-Up is required, a Mark-Up man shall be designated. At Nine Mile Point the Mark-Up man is the responsible person who is assigned to work on or test station equipment or the person who is directing work or tests on equipment. He shall be assigned directly by or under authority of the Shift Supervisor, the Assistant Maintenance Superintendent, the Assistant Instrument and Control Supervisor or Assistant Chemistry and Radiation Protection Supervisor.

During maintenance and testing the markup man shall obtain markups as required on all equipment related to the tests so that he has positive control over test conditions and is protected from any inadvertent operation of equipment. Operators performing surveillance tests, instrument checks or equipment operability tests need not obtain mark-ups.

18. Removal from Service Procedure (Continued)

Equipment or systems which are not operable according to standing operating procedures or upon which for any reason temporary special limitations on operations have been placed shall be tagged with a yellow hold out tag at all controlling points to alert operators to the special conditions.

All equipment in the station not especially tagged to indicate operating limitations shall be considered operable in accordance with operating procedures, standing orders, and/or special orders currently in effect.

It shall be the responsibility of the Shift Supervisor and the Chief Shift Operator to maintain their log in compliance with current standing orders so that a continuous record of the status of the plant is always available in the control room. It shall be their duty when coming on shift to ascertain any changes to equipment or procedures which have occurred since they were last on duty.

QUESTION:

19. Drains

a) Provide the results of an analysis which shows that drains have sufficient capacity, and/or equipment pedestals have sufficient height to prevent standing water from sprinklers and fire hoses from damaging safety-related equipment or supporting systems necessary for safe shutdown of the plant. As an alternate, show that the standing water does not damage such equipment.

b) Identify the areas containing safe shutdown equipment that are not provided with floor drains. Describe the drainage path for those areas without drains.

c) Identify the areas containing combustible liquids that are not provided with floor drains. Describe the drainage path and provisions for containing or diverting the combustible liquid in those areas without drains. In those areas with drains, state the capacity and location of the drain reservoirs and describe the provisions to prevent the spread of flammable liquid fires via the drain system to safety-related areas or to other areas containing combustible liquids.

RESPONSE:

a) An analysis of standing water damage to safety related equipment has been performed. The combination of drains, floor sumps and ponding capability is sufficient to prevent damage to all safety related equipment.

b) The following plant areas which contain safety related equipment are not provided with drains.

Battery Board Room #11 & #12 - The battery board rooms are located on Turbine Building elevation 261 feet. Water would drain underneath the doors onto the floor and then to nearest floor drains.

Feedwater Valve Area - This area is located on Turbine Building elevation 261 feet. Water would drain into Main Steam Lines Pipe Chase.

Battery Room #11 and #12 - The battery rooms are located on Turbine Building elevation 277 feet. Water would drain underneath the doors onto elevation 277 feet and then to nearest floor drains.

19. b) Drains (Continued)

Auxiliary Control Room - The auxiliary control room is located on Turbine Building, elevation 261 feet. Water would drain underneath the door onto elevation 261 feet and then to nearest floor drain.

Main Control Room - The control room is located on Turbine Building, elevation 277 feet. Water would drain underneath the doors onto elevation 277 feet, then to nearest floor drain.

Power Board Room #102 and #103 - The power board rooms are located on Turbine Building, elevation 261 feet. Water would drain underneath the doors onto elevation 261 feet and then to nearest floor drain.

c) The oil storage room, the diesel fire pump room, and the Reactor Building Track Bay are areas which can contain combustible liquids and do not have drains. The oil storage room can drain underneath the door and into (elevation 261 feet) the nearest floor drain. The other two areas are under study.

The remaining areas that have combustible liquids and have drains are discussed below.

Also, floor drain piping does not travel from one safety-related area to another, except for the diesel generator rooms, which are being studied.

Reactor Building - Elevation 198 feet (Combustible Liquid - oil)

Each corner of the Reactor Building has its own 58.8 gallon sump pit for floor drainage. Water from the southeast sump pit and northeast sump pit drains into the 14,363 gallon northeast floor drain sump. Southwest and northwest sump pit drains into 14,363 gallon northwest floor drain sump. Northwest floor drain sump drains into northeast floor drain sump. Northeast floor drain sump goes to the Waste Building which contains no safety-related equipment.

Reactor Building - Elevation 237 feet (Combustible Liquid - oil)

Floor drains are pumped to the Northeast floor drain, which holds 14,363 gallons.

19. c) Drains (Continued)

Reactor Building Track Bay- Elevation 261 feet (Combustible Liquid - gas)

The effects of gasoline drainage into sumps is being studied.

Reactor Building - Elevation 298 feet (Combustible Liquid - oil)

Floor drains go to the floor drain sump which is capable of holding 14,363 gallons.

Turbine Building - Elevation 261 feet (Truck Bays, Reactor Feedwater booster pumps, Reactor feedwater pumps, combustible liquid - oil)

Floor drains are available to hold 985 gallons. The floor drain sump is located in the Turbine Building basement, and then returns to Radwaste. The effects of gasoline from truck bays leaking into floor drains is being studied.

Turbine Building - Elevation 261 feet (Feedwater Isolation Valves, Combustible liquid - oil)

No drains are installed. However, there is grating. Drainage would be through grating to elevation 240 feet and into Main Steam Lines Pipe Chase.

Turbine Building - Elevation 291 feet (Feedwater Pump Discharge Valves #11 & #12, Combustible liquid - oil)

Drainage will go to the 987 gallon floor drain sump in Turbine Building basement.

Turbine Building - Elevation 305.6 feet (Turbine Lube Oil Room)

This is a curbed area, the floor drain is plugged to prevent leakage.

Turbine Generator Area - Elevation 277 feet (Combustible Liquid - Oil)

Drainage would be through grating to hotwell pit and 1174 gallon floor drain sump, and then return to Radwaste.

Turbine Generator Area - Elevation 243 feet (Combustible Liquid - Oil)

Drainage will go to the 1174 gallon floor drain sump.

19. c) Drains (Continued)

Turbine Generator Area, B-C 4-14(Combustible liquid - oil transfer)

Drainage will go to the hotwell pit and two 1173 gallon sumps, and then to Radwaste.

Diesel Generator Building - Elevation 250 feet (Combustible liquid - oil)

Floor drains are available to hold 987 gallons and the floor drain sump returns to the Waste Building.

Diesel Generator Building - Elevation 261 feet (Combustible liquid - oil)

Floor drains will directly to outside of the building. Modifications are in progress to finalize routing.

Screen and Pump House - Elevation 261 feet(Combustible liquid - oil)

Floor drains are available to hold 6,098 gallons. Sump is located on elevation 233 feet. Sump discharges to screenwell discharge flume. Floor drains for electric fire pumps and containment spray pumps go directly into discharge canal. Floor drains for diesel fire pump is plugged. Plan for containing oil is being studied.

Waste Building - Elevation 261 feet (Truck loading, Combustible liquid - gas)

Floor drains go to 1309 gallon floor drain sump, and then to Radwaste. Effects of gasoline drainage is being studied.

Administration Building - Elevation 261 feet (Machine shop, Combustible liquid - oil)

Floor drains go to yard drainage.

QUESTION:

20. Curbed Areas

Provide the results of an analysis that shows that curbed areas surrounding combustible liquid tanks have sufficient capacity to contain the full contents of the tanks plus the quantity of water required for extinguishment of a fire involving the combustible liquid.

RESPONSE:

Turbine Oil Reservoir, El. 261-0

Capacity of one tank equals 5000 gallons. The capacity of the curbed area is 13,166 gallons. The curbed area has sufficient capacity to contain the contents of one tank with a remaining capacity of 8,166 gallons for fire water protection.

Turbine Lube Oil Tank, El. 305-6

Capacity of one tank equals 15,000 gallons. The capacity of the curbed area is 33,146 gallons. Curbed area has sufficient capacity to contain the contents of one tank with a remaining capacity of 18,146 gallons for fire water protection.

QUESTION:

21. Pipe and Ventilation Duct Penetrations

Provide the results of an analysis which shows that the existing or proposed fire barrier penetration seals for pipe and ventilation duct penetrations are adequate to prevent the spread of smoke and fire through the barrier considering the combustible loading and possible air pressure differential.

RESPONSE:

Proposed pipe penetrations through rated fire barriers will be subjected to a qualification fire test performed in conjunction with a cable penetration fire stop test. This test will be performed in accordance with sections of the IEEE Standard 634-1978 "Cable Penetration Fire Stop Qualification Test" which can be applied to pipe penetrations. Mechanical penetrations will be included in both a floor and wall slab test. The ASTM E119 time-temperature curve will be the basis of the test. A hose stream test will also be performed.

Laboratories that are currently acceptable to Niagara Mohawk Power Corporation are not equipped to apply various differential pressures during the fire test. The standard test ovens do place a slight negative pressure on the exposed slab side during test. The hose stream test also exerts pressure on the penetration after test.

Ventilation ducts that pass through rated fire barriers will be equipped with fire dampers with established fire rating sufficient to deter fires with the combustible loading in the given fire area. Fire dampers shall be closed by fusible links or by smoke detector actuation.

QUESTION

22. Piping Containing Combustibles

Identify all piping containing flammable gas or combustible liquid which is routed through areas containing safety-related equipment, safety-related cables or through which personnel must pass to reach safety-related equipment for local operation. Provide an analysis to show that a fire involving the liquid or gas will not prevent safe shutdown or result in the loss of function of a safety-related system. Describe the provisions, if any, to piping systems which would reduce the likelihood or magnitude of a flammable gas or combustible liquid fire.

RESPONSE:

Generator hydrogen cooling and lube oil supply piping to the turbine are routed through safety related areas. These systems are manually controlled locally.

Generator hydrogen cooling is routed above and below cable trays in the Turbine Building area B_A-J, 1-4. Hydrogen lines are partially protected by a channel guard to reduce the chance of rupture by other equipment. The hydrogen supply is opened with a "deadman control." Therefore, any rupture will allow only that much volume of gas in the pipe between the supply valve and unit to leak out and not the entire contents of the storage tanks. The volume of hydrogen that is released under these conditions is not significant. Therefore, cable trays above and below the hydrogen pipe will be protected from any possible gas flame.

Lube oil supply piping is sloped from the oil storage tanks to the filter pumps at the turbine and operates by gravity flow. Pipe crosses cable trays at column row E-4. Cable trays will be protected. Shutoff valves at storage tanks and filter pumps are normally closed.

Both of these fire Areas have been analyzed in Response 3.

If the combustible materials above were to be released and cause a fire, safe shutdown can be achieved.

QUESTION:

23. Diesel Fuel Transfer Shut-Off

Describe the means provided to automatically and/or manually stop the transfer of diesel oil from the storage tanks to the diesel generator day tanks in the event of a fire in the area housing the day tank, or through which the fuel oil transfer piping is routed.

RESPONSE:

The transfer of diesel oil from the diesel oil storage tanks to the diesel generator day tanks can be stopped in the event of a fire in the area of the day tank by manually opening a breaker at a Motor Control Center, MCC-161A or MCC-171A. Breakers are labeled "Diesel 102 Control Panel" and "Diesel 103 Control Panel." The transfer pumps are positive displacement pumps and upon shutdown, flow would cease. The Motor Control Centers are located in the Reactor Building. The possibility of siphoning has been analyzed. This is not expected to occur.

QUESTION:

24. Separation Criteria

Describe the separation criteria used for the routing of electrical cables. Certain cables electrically connected to equipment necessary for safe shutdown may be used for functions designated as non-safety-related and therefore classified as non-safety-related. Examples of these might be remote indicating lights for valves, breakers, etc. Describe whether such cables are kept with the safety division to which they were originally connected and if not, describe the effects on the safe shutdown equipment due to shorts to these cables as a result of fire.

RESPONSE:

The separation criteria is as described by the following excerpts from the Nine Mile Point I Final Safety Analysis Report.

Quoted from FSAR Supplement No. 4:

"Cables are generally separated functionally, i.e., 4160 V. power cable separate from 600 V. power cable for major loads which, in turn, are separated from low-circuit 600 V. power cables and low voltage control cables."

"Vertical fire stops are provided where open cable risers occur between floors outside the Control Room/Auxiliary Control Room."

"Reactor protection and engineered safeguards equipment cables are routed to provide sufficient isolation between similar, functionally duplicated devices so as to prevent a fire in one region of the Station from affecting safe operation of redundant equipment in case of an accident."

Quoted from FSAR Supplement No. 6:

Tray Spacing

"Figures 1 through 3 show the cable routing in the turbine building and typical spacing of all Station cable trays." These figures are attached.

Cables associated with safety related equipment are kept in the safety division from which they originate.

TRAYS BELOW EL. 261'

Figure 1

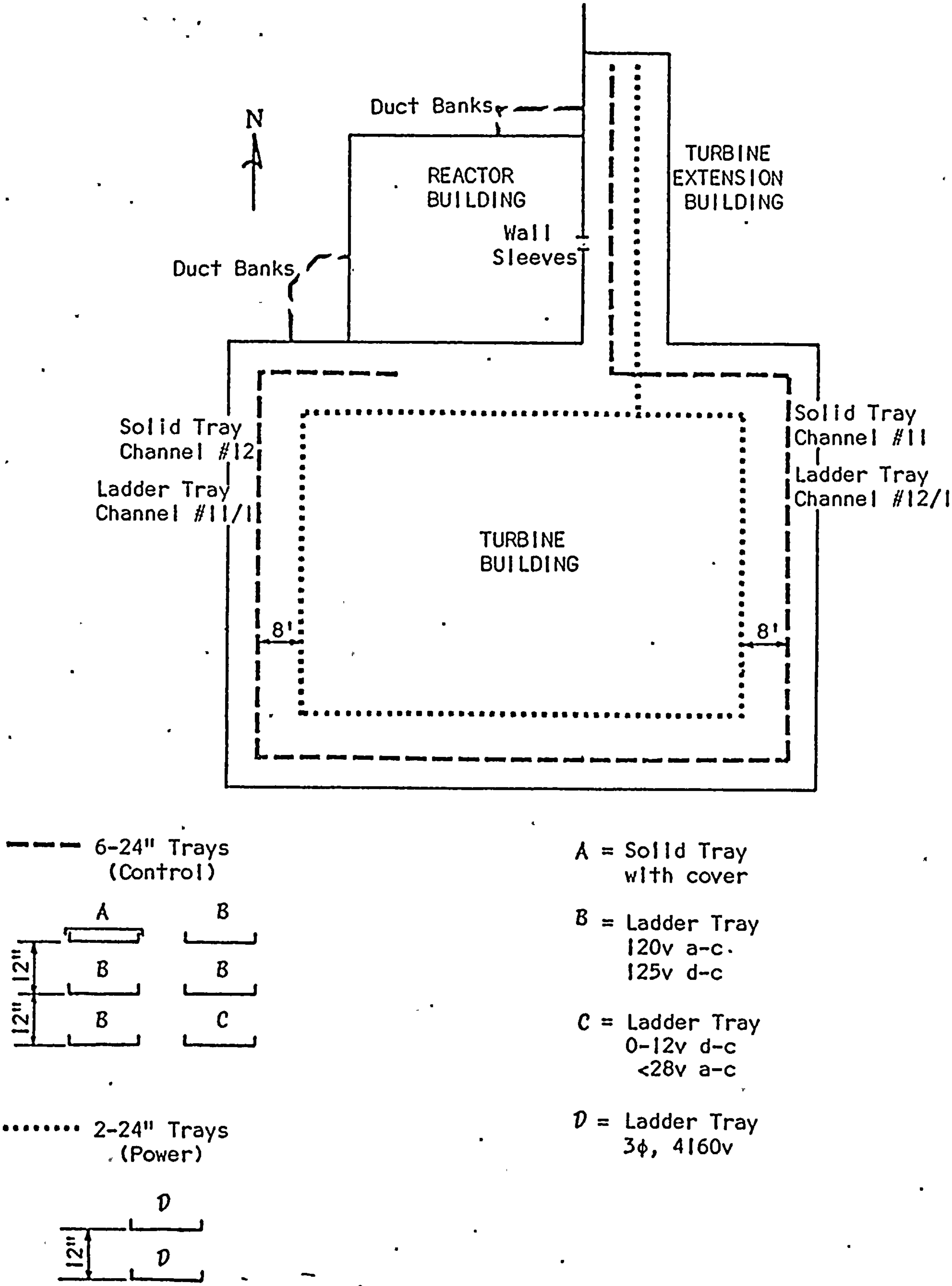
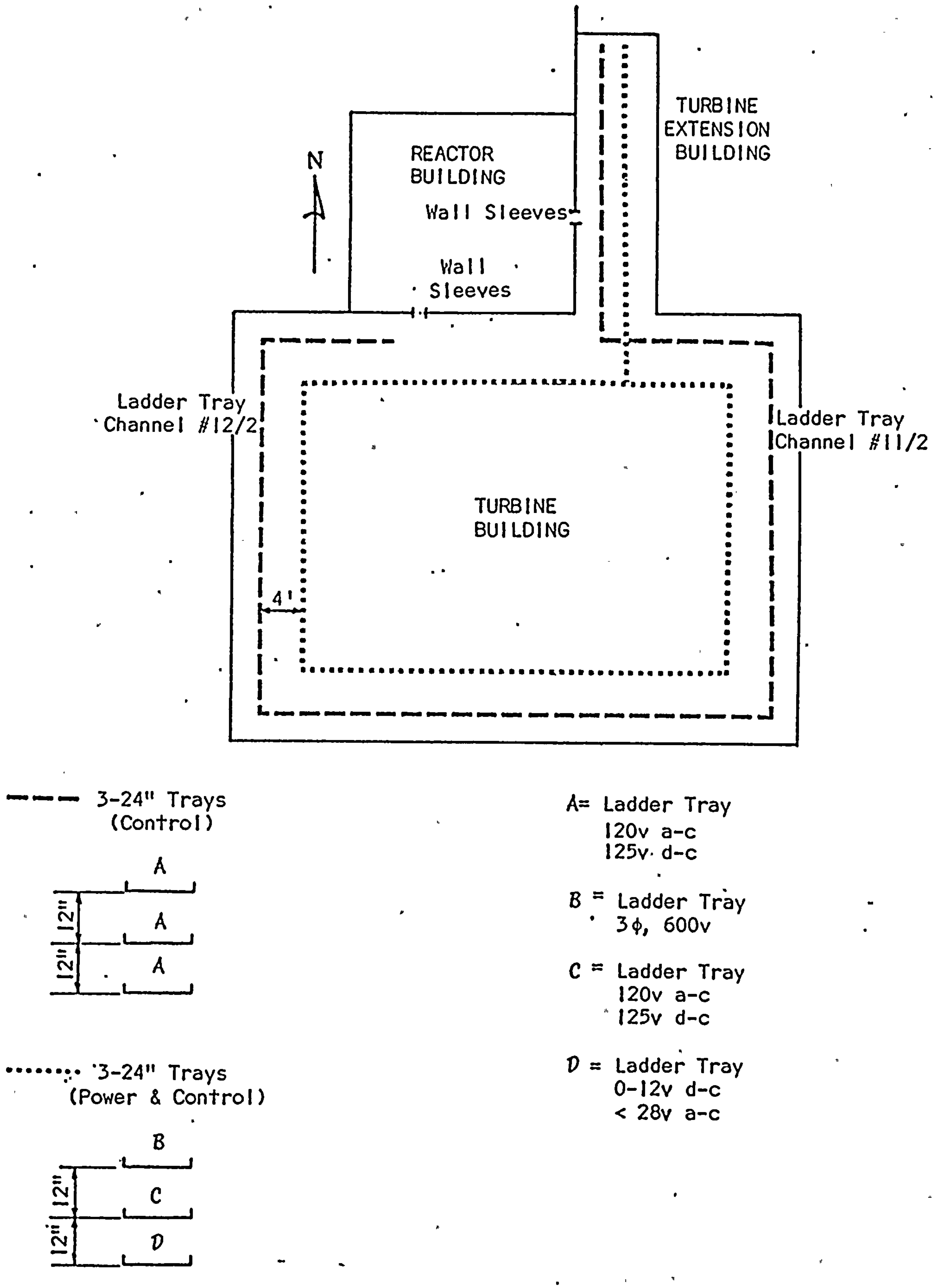
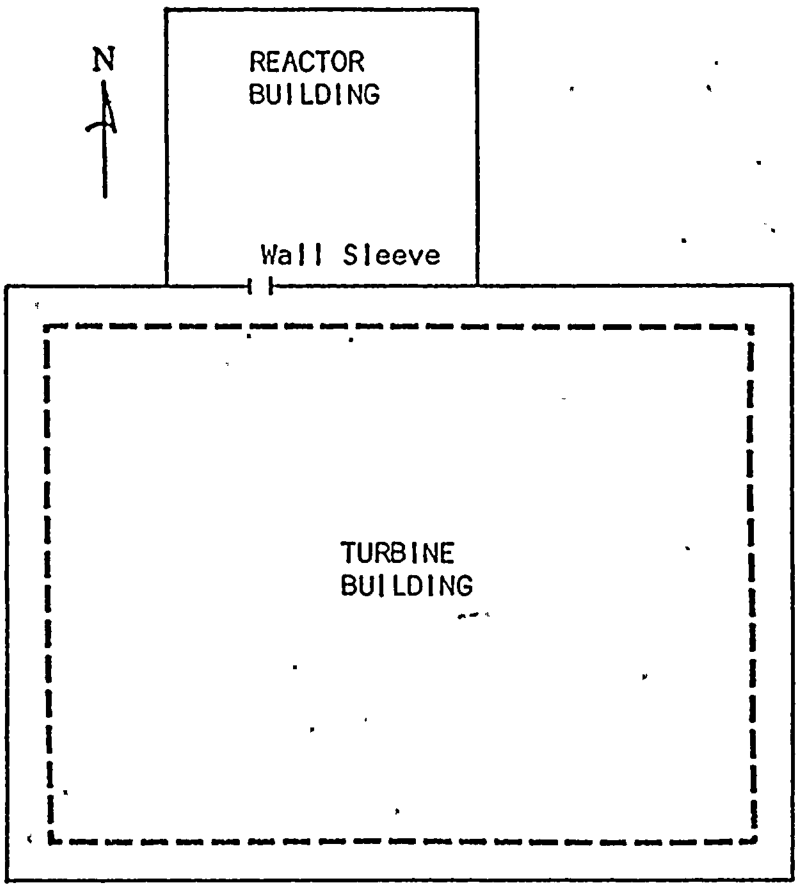
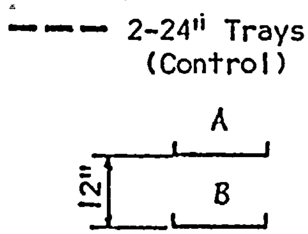


Figure 2


N
REACTOR BUILDING
TURBINE EXTENSION BUILDING
Wall Sleeves
Wall Sleeves
Ladder Tray Channel #12/2
Ladder Tray Channel #11/2
TURBINE BUILDING
4'
3-24" Trays (Control)
A
A
A
12"
12"
3-24" Trays (Power & Control)
B
C
D
12"
12"
A= Ladder Tray
120v a-c
125v d-c
B = Ladder Tray
3ϕ, 600v
C = Ladder Tray
120v a-c
125v d-c
D = Ladder Tray
0-12v d-c
< 28v a-c





A = Ladder Tray
120v a-c
125v d-c

B = Ladder Tray
0-12v d-c
<28v a-c

QUESTION:

25. Fire Stops

Provide a detailed description of existing and proposed fire breaks and fire stops. Include sketches, identification of materials of construction, and description of test results which demonstrate the effectiveness of fire stops used on electrical cubicles and vertical cable trays; and for intersection between horizontal and vertical cable runs. Provide the criteria that were used in the design of the fire breaks and fire stops.

RESPONSE:

Cable penetration fire stops which pass through rated fire barriers include various designs; but all utilize a combination of mineral wool, such as Kaowool, and a flame retardant coating such as Flamastic as the fire stop material. A specification and procedure has been developed to perform cable penetration fire stop qualification tests in order to establish the effectiveness and fire rating in hours of the fire stops.

The cable penetration fire stop qualification test will be performed in basic accordance with IEEE 634-1978, and will meet the intent of the staff position addressed in paragraph PF-2 of enclosure 2 with the exception of the pressure differential requirement. Testing laboratories currently acceptable to Niagara Mohawk are not equipped to perform cable penetration fire stop tests with various differential pressures. A slight negative pressure does exist on the exposed side of the penetration during normal fire tests. The hose stream test does exert pressure on the fire stop upon completion of the fire test.

The cable penetration fire stop test procedure and associated drawings are available for review. Niagara Mohawk drawings which detail existing cable penetration fire stops are also available for review.

Fire retardant cable coating such as Flamastic is proposed to serve as a fire break on heavy tray loading areas which are undesirable to protect with sprinklers. The effectiveness of cable coatings is already established by cable coating manufacturers.

Cable entry into power boards and motor control centers will be sealed with a combination of Duxseal to prevent water entry, and Flamastic as a fire retardant coating. No specific fire stops are proposed for the intersection of horizontal and vertical trays other than those already installed. Fire stops utilizing Flamastic are installed on vertical cable trays where they pass through non-fire rated floors.

A combination of fire detection, sprinklers and flame retardant cable coatings are proposed to protect the cable tray system. Cable penetration fire stops are utilized to contain cable tray fires within established fire areas. Proposed protection, detection and related design is delineated in the Nine Mile Point Unit #1 fire protection program.

QUESTION:

26. Cable Insulation Materials

Identify all types of cable used in all areas of the cable tray system. For each type of cable, identify the materials used for insulation and jacketing. State the combustion and toxic characteristics of each type of material. Identify whether flame tests were performed on single and jacketed assemblies. Provide the acceptance criteria and results of the flame tests. Identify the flame temperature used, the exposed area, and the heat rate. Provide a comparison between the test procedures and the IEEE 383 flame test procedures.

RESPONSE:

The cable used for original construction of Nine Mile Point Unit 1 is combustible and contains toxic gases when it burns. The power cable uses Kerite insulation with a single conductor jacket similar to polyvinyl cloride with an overall neoprene jacket.

Since the middle of 1974 all cable purchased and installed in cable tray meets the IEEE Standard 383-1974 qualification test. Recently installed cable has included fire retardant Kerite or other fire retardant cable.

No flame tests which correlate to IEEE 383-1974 have been performed on original installation plant cable. The combustion qualities of this cable insulation and jacket materials have been shown in many industry tests.

Niagara Mohawk is aware of the potential fire hazard of heavy cable loading areas and has proposed suitable methods for protection. Fire Detection, sprinkler protection and cable coating have been proposed as defined in the Nine Mile Point Unit #1 fire protection program. Cable penetration fire stops are also proposed which will contain any postulated cable tray fire within its fire area.

QUESTION:

27. Method of Heat and Smoke Venting

In all the areas where manual firefighting is proposed as either primary or backup means of suppression, describe the methods which would be used for heat and smoke removal using either fixed or portable air handling equipment. If the plant HVAC systems are proposed for such service, provide design data to show that these systems are rated for the conditions (temperature and capacity) required when used for this service.

RESPONSE:

Nine Mile Point Unit 1 will utilize normal ventilation for smoke removal in some areas. When these systems are used dampers will be utilized with temperature interlocks. The interlocks will prevent the use of normal ventilation when the temperature exceeds 250°F. Normal ventilation will be used for low temperature (less than 250°F) smoke. To supplement the normal ventilation smoke and heat vents will be utilized as discussed below.

TURBINE BUILDING: The turbine building's normal ventilation is provided by two (2) 85,000 CFM supply fans and one 170,000 CFM exhaust fan. This normal ventilation accounts for approximately one air change per hour which is not deemed sufficient for heat and smoke removal. The proposed fire venting system would include a series of roof mounted heat and smoke vents that will be actuated by fusible link and manual actuation from a remote location. These vents will provide an additional smoke venting capacity of approximately two air changes per hour giving a total capability of three air changes per hour for smoke venting in the turbine building. These vents will also allow five to six air changes per hour in the case of heat removal without the use of the normal ventilation system. Smoke is being defined as combustion products below 250°F while heat is the combustion product in excess of 250°F. In a relatively small oil cable PVC fire, a great deal of smoke can be produced without an excessive heat buildup.

TURBINE BUILDING BASEMENT: The existing normal basement ventilation consists of an air supply equivalent to approximately 1½ air changes per hour with the air being exhausted by migration to the upper floors. This flow would not be used for emergency fire venting situations. As a part of the fire protection program, the basement area will be separated from the upper floors during a fire situation by a three-hour barrier, thus eliminating any means of exhausting air and smoke from this area.

The proposed scheme for ventilation will use the existing ductwork with some modifications for air and smoke exhaust and several ground-level intakes to supplement the supply air. This will yield approximately three air changes per hour. The system is designed to effectively handle smoke generated in the basement. However, this system is not intended to handle intense heat. Therefore there will be a temperature interlock on the exhaust duct in order to prevent the dampers from being opened and drawing in hot combustion gases which could damage the normal plant ventilation equipment and spread fire. Temperatures over 250°F will prevent the basement damper(s) from opening.

27. Method of Heat and Smoke Venting (Continued)

CABLE SPREADING ROOM: At the present time there is no ventilation in this area. In order to remove smoke in the event of a fire in this room, a damper will be installed to open which will allow the smoke to be drawn into and up a masonry smoke shaft via a roof mounted fan. This will discharge the smoke at the elevation of the turbine building roof. Supply air for this room will come from an opened fire door drawing air from the turbine building basement. The system will be capable of supplying on the order of four air changes per hour. The smoke shaft will also be used by the main and auxiliary control rooms. The fan is capable of operating for extended periods at temperatures of 200°F and and higher temperatures for short periods of time.

MAIN AND AUXILIARY CONTROL ROOMS: Main and Auxiliary Control Rooms are currently vented and air conditioned by what is essentially a recirculated air system. Approximately 96 percent of the air is reused, with the additional 4 percent being makeup air from the outside. This was considered unacceptable since in a fire situation smoke would be recirculated, causing loss of sight of the control board. In order to eliminate this, the recirculation ductwork will be capable of being bypassed and the fan will draw in 100 percent fresh air. The exhaust air will be removed through the same smoke shaft that is used for the cable spreading room. The main and auxiliary control rooms will use butterfly valve dampers in order to provide isolation air tightness as well as protection from fire in the case of venting the cable spreading room. With the use of fire dampers, it will also be possible to isolate the main and auxiliary control rooms should a fire occur in one but not the other. Since the air supply fan is located in the turbine building, it is possible that a major fire could destroy the air supply to the system. Should this happen, it would be possible to open doors to the administration building for a suitable air supply. The location of the exhaust fan on top of the smoke shaft should provide reasonable protection against the loss of this equipment.

REACTOR BUILDING: The reactor building normal ventilation is supplied by a two-speed fan capable of 35,000 CFM at low speed and 70,000 CFM at high speed. The exhaust fan has similar capabilities.

The ventilation system provides the reactor building with approximately one air change per hour at low speed and about two air changes per hour at the higher speed. Due to the inherent design of the reactor building and equipment within, the amount of combustibles is low. This low fireload along with the two air changes per hour capability supply provides more than adequate protection against any postulated fire.

WASTE DISPOSAL BUILDING: Supply and exhaust ventilation for the waste disposal building exchange air at a rate of 9,000 CFM which corresponds to approximately one air change per hour. By its nature, the waste disposal building contains little combustible material. Therefore, the ventilation for this building is considered adequate. As an extra precautionary measure, areas with high combustible potential, such as the Waste Baling room, have been isolated.

27. Method of Heat and Smoke Venting (Continued)

SCREEN HOUSE & DIESEL GENERATOR ROOMS: These rooms are not serviced by normal ventilating air. However, roof vents provide more than adequate smoke and heat removal in the event of fire. These are relatively isolated from the rest of the plant, thereby reducing the risk of smoke movement into other areas of the plant.

102 & 103 EMERGENCY SWITCHGEAR: These rooms are not serviced by any significant amount of normal ventilation. However, their relatively small volume facilitates smoke removal by use of portable ventilating fans.

BATTERY ROOM: The normal battery room ventilation is the equivalent of approximately one air change per hour, which is sufficient for removal of battery gases. For emergency smoke removal, portable fans would be used to supplement the existing normal fans.

OFF-GAS BUILDING: The supply air for this system comes from the turbine building at a rate of 5400 CFM and is removed by an exhaust fan operating at the same capacity. This air flow is equivalent to approximately 1½ air changes per hour. Due to the low fire load in this area, the normal ventilation system will provide adequate air movement for emergency situations. Charcoal fires and explosions are expected to be contained in the Offgas System. The Offgas System is designed to accommodate offgas explosions. Fires in charcoal columns within the system can be isolated. This will extinguish the fire.

QUESTION:

28. Prevention of Fire and Smoke Spread

Describe the manner in which fire and smoke are prevented from spreading from area to area via the normal and emergency ventilation systems in all parts of the plant areas. Describe the location, actuation method and fire rating of dampers used for fire and smoke control in both air supply and return air systems. Describe the details of interlocks for ventilation system shutdown or mode change that can be utilized for fire and smoke control.

RESPONSE:

TURBINE BUILDING: The turbine building is considered to be one (1) fire area with only the basement being considered as a separate area. All the turbine building fans, both supply and exhaust, are contained within the turbine building. Also, all of the ductwork with the exception of the basement supply air ducts are contained solely within the turbine building. This means no fire dampers are required in the turbine building other than to provide isolation of the basement.

TURBINE BUILDING BASEMENT: Six (6) fire dampers will be required on the existing turbine building supply ductwork in order to provide isolation from the turbine building fire zone. These dampers will carry a three-hour rating closed by fusible line and/or smoke detector and manually reopened as required since these will not be an integral part of the basement ventilation system.

The proposed ductwork that is to be used to exhaust smoke from the basement through the existing turbine building exhaust system must be protected by fire dampers. The fire dampers for this ductwork will be rated for three hours, closed by fusible link and/or smoke detection, and reopened with a remote device. These dampers will also have a temperature interlock to prevent the dampers being opened at temperatures that would damage the ductwork, equipment and fans.

REACTOR BUILDING: At the point where the reactor building ventilation ductwork passes through the fire wall at the Turbine Building there are blocking valves which serve as a shut off in the event of excessive radiation. These valves have no fire rating, however their substantial construction should provide a more than adequate barrier against the spread of fire and smoke.

28. Prevention of Fire and Smoke Spread (Continued)

WASTE DISPOSAL BUILDING: The waste disposal building itself does not require fire dampers for any of its internal ventilation since all ventilating ductwork and fans are contained within the fire area and therefore will not contribute to the propagation of fire and smoke to other fire areas. There is a duct used for off-gas system ventilation that does pass through the basement and into and out of the waste building fire area on its way to the turbine building exhaust fan. This duct will require three (3) three-hour rated fire dampers: one at each penetration, the turbine building basement, into waste disposal building, and out of waste disposal building.

CONTROL ROOM COMPLEX: (Control Room, Auxiliary Control Room, and Cable Spreading Room.) The cable spreading room has no existing ventilation to spread smoke and fire. The proposed exhaust vent to the smoke shaft will have a three-hour rated damper or an equivalent to prevent spread of fire and smoke into or out of this area. This damper would be normally closed and opened remotely when required.

The auxiliary control room ventilation is part of the main control room recirculated air. This room is also protected with the Cardox fire suppression system which must be isolated when in use. The existing system already has dampers on the supply and exhaust ducts. The existing dampers must be modified in order to make them close under smoke conditions in order to protect the control room from the spread of smoke and fire. These dampers will be equipped with a remote opening system so that the recirculation air bypass (100 percent fresh air) system may be used in order to clear smoke and CO_2 after the fire is under control. This will allow manual firefighting and also cleanup operation to begin. The damper (valve) exhausting to the smoke shaft will be normally closed and will supply an equivalent threehour protection although it may not have a rating. It will be remotely operated from the control room.

The control room receives its ventilation from a fan located in the turbine building with the duct passing through the turbine-control room wall. This penetration will require a two-hour rated damper. The exhaust damper (valve) to the smoke shaft will be normally closed and will supply equivalent three-hour protection although it may not have a rating. It will be remotely operated from within the control room.

OFF-GAS BUILDING: The off-gas building ventilation is self-contained within one fire area and therefore needs no dampers within the building itself. The supply air for this building comes from the turbine building through a fire rated door. This door can be closed in the event of an emergency; preventing the spread of smoke and fire. The exhaust air from the fans passes through the waste disposal building on the way to the stack. At the point where this duct passes from the offgas to the waste disposal buildings, a three hour fire damper will be installed.

28. Prevention of Fire and Smoke Spread (Continued)

SCREEN HOUSE: The screen house has a roof air exhaust system with supply air coming from infiltration. Therefore no separation is required for the exhaust system. There is a rated fire door to the turbine building that will prevent the spread of smoke and fire.

QUESTION:

29. Ventilation System Power and Control

Identify all areas where ventilation systems power supply or control are located within the area they serve. Provide the basis for leaving ventilation systems power and control cables within the area they serve.

RESPONSE:

TURBINE BUILDING FANS: The turbine building fans are located within the confines of the turbine building fire area. However, they are positioned in low fire load areas in order to minimize the possibility of being affected by fire. A standby fan in the same area for each unit also acts as a safeguard should one fan be rendered inoperable. The power supply and controls for these fans are located within the turbine building fire area, and although unlikely, an isolated fire could cutoff power to any one of or all three of the turbine ventilation fans.

Should the exhaust fan be affected, the roof mounted smoke and heat vents can be used to provide the necessary exhaust flow. Although these vents are designed primarily for heat relief in the case of a large fire, they will also supply the equivalent of approximately two air changes per hour when used for smoke removal.

In the event that the supply fans are affected, it is possible to obtain sufficient ventilation by opening two exterior doors. Therefore, if all the turbine building ventilation fans were lost due to fire damage, by opening the roof vents and exterior doors, approximately two air changes per hour could be achieved.

REACTOR BUILDING FANS: In the case of the reactor building ventilation fans, both the supply and exhaust fans are located outside the confines of the reactor building fire zone. The power and control cables are located in the turbine building and are thereby separated from the reactor building fire area.

WASTE DISPOSAL BUILDING FANS: The waste disposal building fans are not isolated in any way from the building fire area. However, loss of this equipment will not affect the safe shutdown of the plant. Also the fire load in this area is very low, and portable equipment can be used if necessary.

CONTROL ROOM FAN(S): The existing control room ventilation fan is located in the turbine building, isolated from the control room fire area. The power supply also comes from the turbine building area. The existing fan is a recirculation fan and will be used as a supply fan with the recirculation ductwork bypassed for emergency ventilation. To provide exhaust air under these emergency conditions it is proposed that a fan be mounted atop a smoke shaft. This will isolate the fan itself and the power supply from the control room ventilation. The controls for both of these fans are to be located in the control room. Normal ventilation is controlled also in this area. The postulated fire in this area is assumed to be small and will not affect the control equipment.

QUESTION:

30. Preventing Recirculation of Ventilation Air

Describe the separation between the air intakes and exhausts for normal and emergency ventilation systems and the current and proposed provisions which prevent smoke from being drawn back into the plant.

RESPONSE:

The plant design and configuration is such that the exhaust is expected to be carried away from the plant air intakes (see attached). All the exhaust air from the plant under normal ventilating conditions and for small fires that can be handled by the normal ventilation system is released from the stack. The stack is over 170 feet above all of the supply intakes, and with a gas exit velocity of 63 feet per second, sufficient dispersing should occur.

In the circumstance of a fire in the turbine building in which the roof vents were used as a method of exhausting smoke, should the turbine building supply fans begin to draw smoke in, these fans could be turned off and two large doors at ground level could be opened for sufficient supply. Should the control room intake begin to draw significant amounts of smoke, it will be possible to shut off the supply fan and open a door into the administration building to supply air and use the exhaust fan mounted on the smoke shaft for air removal. This would maintain visibility in the control room. The location of the reactor building intake provides adequate separation from the stack as well as the roof vents under normal conditions. Should some smoke migrate to the reactor building intake, this would be tolerable. A great deal of smoke would necessitate shutting off the supply fan. This will cause a more negative pressure in the reactor building.

STATION FLOOR PLAN BETWEEN ELEVATIONS 317' – 0" AND 369' – 0"

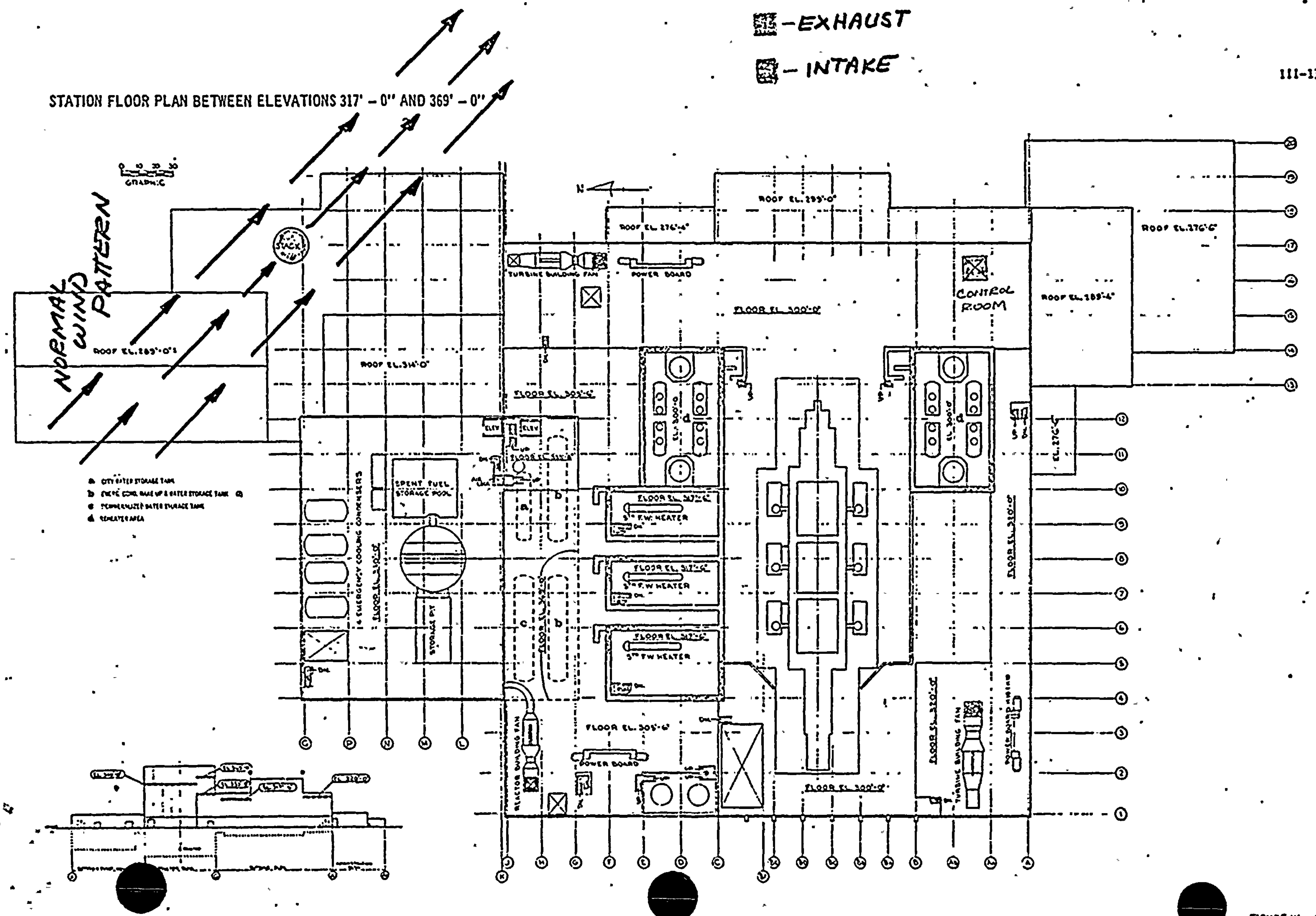


FIGURE III – 8

QUESTION:

31. Operation of Fire Dampers

Discuss the provision for remotely reopening fire dampers (including dampers actuated by carbon dioxide suppression system operation) for post-fire smoke venting.

RESPONSE

In areas where the normal ventilation system will not be the primary source of emergency ventilation, there will not be a need for remote reopening of closed fire dampers. For these areas roof vents will provide smoke venting capability.

In areas where the normal ventilation system will also be used for emergency ventilation, such as the turbine building basement and in some cases the control complex, a commercially available automatic damper operator will be used to reopen the dampers that will be needed for emergency ventilation. This includes dampers which will be used in conjunction with the Cardox system.

The dampers used for shutoff between the smoke shaft and the control complex (main and auxiliary control rooms) will be of a valve type in order to maintain the integrity of the seal in the control areas. These valves will be similar to those used for isolation of the reactor building, and although they do not have a documented fire rating, design data will be correlated in order to determine an equivalent rating.

QUESTION:

32. Combustible Filters

Identify the location of all combustible filters used at the plant and discuss the potential fire hazard involved at each location. Describe the fire detection and suppression capability and fire prevention measures for all such combustible filters. Provide the results of an analysis on the effects of combustion of the filters in terms of heat, smoke generation, radiation release, and damage to safety-related equipment.

RESPONSE: The following is a list of combustible filters used at Nine Mile Point Unit 1.

Location of Combustible Filters

Type	Service	Location
Charcoal Filter	Reactor Bldg Emergency Ventilation	Elevation 290 feet
Charcoal Filter	Reactor Bldg Emergency Ventilation	NB - 12-13
High Efficiency Filters	Control Room Emergency Ventilation	Elevation 300 feet
Charcoal Filters	Control Room Emergency Ventilation	A A_A - 16-17
Charcoal Columns	Off Gas System	Elevation 250 feet
Charcoal Columns	Off Gas System	Turbine Building
Charcoal Columns	Off Gas System	Elevation 261 feet
Charcoal Columns	Off Gas System	Turbine Building
Charcoal Columns	Off Gas System	
Charcoal Columns	Off Gas System	
Charcoal Columns	Off Gas System	
Charcoal Columns	Off Gas System	
High Efficiency Filters	Lab-Vent System	Elevation 261 feet
High Efficiency Filters	Lab-Vent System	Turbine Building
High Efficiency Filters	Off Gas Ventilation	Elevation 232 feet
High Efficiency Filters	Off Gas Ventilation	Turbine Building
Roughing Filters	Waste Building	Elevation 277 feet
Roughing Filters	Waste Building	Waste Building
Roughing Filters	Waste Building	
High Efficiency Filters	Waste Building	
High Efficiency Filters	Waste Building	
High Efficiency Filters	Waste Building	
High Efficiency Filters	Waste Building	
Filter	Waste Building	
Filter	Waste Building	Elevation 277 feet
Filter	Waste Building	Waste Building
Filter	Waste Building	

32. Combustible Filters (Continued)

Charcoal filters in the Reactor Building Emergency Ventilation System and the Control Room Emergency Ventilation System will be protected by smoke detectors and a manual dry pipe sprinkling system. The remaining filters on the list are relatively small (less than 3 feet by 3 feet) and are expected to have very little fire load. The smaller filters are not expected to effect safe shut down equipment. Additionally, after the stock of these filters is depleted, only fire resistant filters will be used.

If a fire were to occur in the Offgas Charcoal columns a high temperature alarm would be annunciated in the Control Room. The Shift Operator would isolate the system. This will extinguish the fire.

QUESTION:

33. Emergency Breathing Air

Describe the total capacity of the presently available self-contained breathing units including reserve supply. Describe how this capability will be upgraded by the addition of the air compressor.

RESPONSE:

There are at this time twenty-two Scott Air-Paks units available with one spare bottle for each unit. This is equivalent to a storage of eleven hours. With the installation of the breathing air compressor, it will be possible to fill six air pack units in the period of fifteen minutes or the equivalent of 24 air packs per hour or additional twelve hours of storage. There are sixteen Scott Air-Pak units on order with a total of 30 spare tanks. This gives a total of 90 tanks for 38 masks. With the addition of the air compressor, a more than adequate supply of air is available.

QUESTION:

34. Proximity of Regular and Emergency Lighting Wiring

Provide the results of an evaluation of the potential for a fire in a safety-related area to cause damage to electrical wiring which would result in the loss of both regular and emergency lighting to areas providing access to the fire or egress from the area. State the number of portable lights designated for emergency use at a central location.

RESPONSE:

Emergency lighting is powered by an uninterruptable power supply. Electrical cables to emergency lighting are run independently of normal lighting. The majority of emergency lighting cabling is run to fixtures through conduit imbedded in floor slab concrete. This practice results in reasonably good resistance to fire.

If the power cables to emergency lighting are damaged due to a postulated fire in one fire area, loss of emergency lighting in other fire areas could result. Additional emergency lights which are powered by a self-contained battery-battery charger will be provided. These additional lights are intended to supplement existing emergency lighting for egress areas.

Five portable hand-held lanterns are provided in each of the three fire cabinets, for fire brigade use.

QUESTION:

35. Communication Systems

Verify that emergency communications can be maintained for any fire area by using equipment located onsite that is not subject to damage from a fire in the area.

RESPONSE:

Emergency communications can be maintained for any fire area by the following:

a) Portable radios: Fire radios using the Oswego County Fire Channels are available for the brigade to use.

b) The Gaitronics System has been analyzed, but may be subject to some fire damage. The Gaitronics System, the Bell System telephone code-call system and other systems are being evaluated.

Communications can be maintained during a fire in a given fire area by the use of portable two-way radios. Five portable radios are placed in strategic areas around the station. Two frequencies are provided exclusively for fire brigade communications.

QUESTION:

36. Fire Detection System Design

Provide design data for the automatic fire detection system in each fire area, including such items as type, number and location of the detectors; and signaling, power supply and supervision of the system. Identify any deviation(s) from NEPA 72D.

RESPONSE:

The following ionization detectors, Pyr-A-Larm DIS 3/5A, are used:

Location	Quantity
Cable Spreading Room	9
Auxiliary Control Room	8
Record Storage Room	4
Temporary File Room	4
Telephone Room	2
Administration Offices	6

The following heat detectors, Fenwal #27121, are used:

Location	Quantity
Turbine Oil Storage Tank Room	2
Recirculation Pumps M-Y Sets	15
Power Board 103	2
Power Board 102	2
Turbine Generator	75
Diesel Generator 102	4
Diesel Generator 103	4

Power for the fire detection systems is provided from an A.C. uninterruptible power supply or a Station Battery D.C. Source. All detection circuits are supervised. The signaling system is designed in accordance with NEPA 72D, Class B.

QUESTION:

37. Fire Suppression System Design

Provide the design data for all automatic suppression systems (both existing and proposed) including such items as design densities, soak times, power supplies, and associated alarms. Identify areas of non-compliance with appropriate NFPA Standards.

RESPONSE: The following information is provided for the automatic suppression systems at Nine Mile Point.

Water Spray Protection for Turbo-Generator

System 1A

355 gpm at 96 psi
Density = .25 gpm/ft^2

System 1B

298 gpm at 95 psi
Density = .25 gpm/ft^2

System 1C

146 gpm at 95 psi
Density = .25 gpm/ft^2

System 1D

255 gpm at 95 psi
Density = .25 gpm/ft^2

System 1E

267 gpm at 96 psi
Density = .25 gpm/ft^2

System 1F

402 gpm at 95 psi
Density = .25 gpm/ft^2

System 1G

442 gpm at 96 psi
Density = .25 gpm/ft^2

Control of water spray systems is by means of motor operated valves with remote operation from the control room. Valves are also capable of manual operation in the foam room. Valve motors operate on D.C. station battery power for reliability.

All water spray systems are designed to meet the requirements of National Fire Protection Association Standard No. 15.

37. Fire Suppression System Design (Continued)

Foam-water Spray Protection for Turbo-Generator

System 11

881 gpm at 96 psi
Density = 0.16 gpm/ft^2

System 12

861 gpm at 96 psi
Density = 0.16 gpm/ft^2

System 13

828 gpm at 96 psi
Density = 0.16 gpm/ft^2

System 14

831 gpm at 96 psi
Density = 0.16 gpm/ft^2

System 15

803 gpm at 96 psi
Density = 0.16 gpm/ft^2

Open head deluge type foam-water sprinkler protection is installed to cover the floor area under the turbo-generator unit. Two systems are expected to operate on a single fire.

The foam-water protection is divided into multiple systems to afford flexibility in fire attack and to limit the total water demand required. Water supply is from the header located in the foam room which is connected to the fire main system through a line strainer. Systems are designed to operate at a minimum design pressure of 90 psi.

Foam injection equipment located in the foam room consists of two foam solution tanks, one in service and the other as a connected reserve, with sufficient capacity to provide a minimum 10 minute supply for the largest number of foam-water sprinkler systems expected to operate on a single fire. Sufficient foam solution is provided to establish an adequate foam blanket over the entire hotwell pit. Two foam solution pumps for the systems are provided, one A.C. powered, the other D.C. powered from the station battery. Injection into the system risers is through metering orifices on the foam solution lines.

Control of the foam-water sprinkler systems is by means of D.C. motor operated valves as described above. Actuation of the foam pumps is through auxiliary contacts on the valves with provision for manual starting in the foam room.

Foam-water sprinkler systems are designed to meet the requirements of National Fire Protection Association Standard No. 16.

37. Fire Suppression System Design (Continued)

CO_2 Protection

Lube Oil Tank Room

Total flooding requirement - 1137 lbs. CO_2
Total discharge period - 64 sec.
Design flow rate - 1400 lbs./min. liquid
Design Concentration - 35%

M.G. Sets, El. 261-0

Local application
Total discharge period - 180 sec.
Design flow rate - 2790 lbs./min. liquid

Power Board Room No. 102

Total flooding requirement - 824 lbs. CO_2
Total discharge period - 135 sec.
Design flow rate - 600 lbs./min. liquid
Design Concentration - 50%

Power Board Room No. 103

Total flooding requirement - 824 lbs. CO_2
Total discharge period - 135 sec.
Design flow rate - 600 lbs./min. liquid
Design Concentration - 50%

Generator Exciter

Total flooding requirement - 394 lbs. CO_2
Total discharge period - 60 sec.
Design flow rate - 865 lbs./min. liquid
Design Concentration - 50%

Turbine-Generator Bearings

Local application
Total discharge period - 64 sec.
Design flow rate - 720 lbs./min. liquid

Turbine-Generator Oil Tank

Total flooding requirement - 72 lbs. CO_2
Total discharge period - 80 sec.
Design flow rate - 400 lbs./min. liquid
Design Concentration - 35%

Diesel Generator 102

Total flooding requirement - 2860 lbs. CO_2
Total discharge period - 60 sec.
Design flow rate - 4200 lbs./min. liquid
Design Concentration - 35%

37. Fire Suppression System Design (Continued)

CO_2 Protection (Continued)

Diesel Generator 103

Total flooding requirements - 2860 lbs. CO_2
Total discharge period - 60 sec.
Design flow rate - 4200 lbs./min. liquid
Design Concentration - 35%

Cable Spreading Room

Total flooding requirements - 3065 lbs. CO_2
Total discharge period - 140 sec.
Design discharge flow rate - 2025 lbs./min. liquid
Design Concentration - 50%

Auxiliary Control Room

Total flooding requirements - 4779 lbs. CO_2
Total discharge period - 160 sec.
Design discharge flow rate - 2400 lbs./min. liquid
Design Concentration - 35%

Carbon dioxide supply is from a 10-ton low pressure refrigerated supply tank piped to the individual hazards through master and hazard valves.

Control circuits for the carbon dioxide system are D.C. powered with electric thermostats provided for actuation of the automatic portions of the system. Operating alarms are remoted to the control room alarm annunciator and local alarm bells are provided for the automatic sections.

The carbon dioxide system is designed in accordance with the requirements of National Fire Protection Association Standard No. 12.

Sprinkler Protection (existing)

Sprinkler systems are wet-pipe systems installed per ordinary pipe schedules. There is a dry-pipe sprinkler system in the Reactor Building Track Bay.

The individual systems are provided with vane type electric alarm switches located in the system risers.

The sprinkler systems are supplied from the fire main system and are installed in accordance with the requirements of National Fire Protection Association Standard No. 13.

37. Fire Suppression System Design (Continued)

Sprinkler Protection (proposed)

Proposed sprinkler systems will be dry pre-action systems per NFPA Standard #13 and American Nuclear Insurers requirements.

Water Spray Protection - Transformers and Hydrogen Storage Tank

Main Transformer

1265 gpm @ 69.6 psi
Density = 0.26 gpm/ft^2 of projected area of transformer

Station Service Transformer

387 gpm @ 93.39 psi
Density = 0.25 gpm/ft^2 of projected area of transformer

Reserve Transformers (2)

282 gpm @ 78.2 psi
Density = 0.25 gpm/ft^2 of projected area of transformer

Hydrogen Storage Rack

233 gpm @ 68.6 psi
Density = 0.25 gpm/ft^2 of projected area of hydrogen storage rack

The spray systems protecting the transformers and hydrogen rack are of the fully automatic type. Water supply is from the fire main system with line strainers located ahead of the deluge valves controlling the systems. Actuation is by means of rate of rise pneumatic systems located over the equipment and connected to the deluge valves. Electric alarm circuits connect the systems to the control room.

Alarms and Supervisory Systems

All equipment areas protected by water spray, foam-water sprinkler and carbon dioxide systems are equipped with fire detection equipment. Spray systems for the transformer and hydrogen dock employ rate of rise pneumatic detectors while electric thermostats are utilized for the remainder. Automatic sprinkler protected areas employ electric water flow indicators as alarm devices.

The detection equipment in the area of the turbo-generator unit is divided into multiple circuits to permit improved accuracy in pinpointing a fire location. This system is of the automatic resetting type to permit continuous monitoring of fire temperature conditions to guide the control room operators in the operation of the protective systems.

37. Fire Suppression System Design (Continued)

Alarms and Supervisory Systems (Continued)

All alarm systems are monitored on an annunciator panel in the control room. Audible signals are provided in the control room.

All alarm and protective systems are equipped with signalling devices to detect system malfunctions with visual audible indication on the control room annunciator panel.

Manual reporting of fire is by means of the station telephone system or public address system (Gaitronics). Audible alerting of station personnel is over the station public address system with a tone control to serve as an alert.

Alarm systems except for the public address system are installed in accordance with the requirements of National Fire Protection Association Standard No. 72D, Class B.

QUESTION:

38. Remote Shutdown Panels

Provide an analysis to demonstrate that no fire which could impair control from the control room could also prevent control from remote shutdown panels. Identify any interconnections between the remote shutdown panel and the control room and discuss the means of isolating the two control stations in the event of a fire.

RESPONSE:

No remote shutdown control panel is presently installed at Nine Mile Point Unit 1. The possible addition of such a panel is under study.

QUESTION:

39. Radiological Consequences of a Fire

Evaluate the radiological consequences of a fire in radwaste areas and areas containing contaminated materials such as filter cartridge, spent resin, etc.

RESPONSE:

The Radwaste building fire

The inventory of radioactive waste (excluding the Offgas System) present may be estimated as:

dry compressible, four months	4 Ci
filter sludge, one year	690 Ci
spent resin, six months	268 Ci

Since this estimate does not include evaporator bottoms (in water suspension) or installed filters, a conservative estimate would double this total (962 Ci), to 2000 Ci.

Assuming release over a 12 hour period:

$$\frac{2000 \text{ Ci}}{12 \text{ hrs} \times 3600 \text{ sec/hr}} = 0.046 \text{ Ci/sec}$$

For a ground level release, assuming Pasquill Category F, with wind speed of 1m/sec, χ/Q at 1500 meters (site Boundary) is 2×10^{-4} sec/m^3 (Reg. Guide 1.98, Figure 1, Ground Level Release Atmospheric Diffusion Factors).

$$Q \times \chi/Q = 0.046 \text{ Ci/sec} \times 2 \times 10^{-4} \text{sec/m}^3 = 9.2 \times 10^{-6} \text{ Ci/m}^3$$

Assuming average gamma energy of 1mev/dis:

$$D = 0.25 \bar{E} X = 0.25 \times 1 \times 9.2 \times 10^{-6} = 2.3 \times 10^{-6} \text{Rad/sec}$$

$$2.3 \times 10^{-6} \text{Rad/sec} \times 3600 \text{ sec/hr} = 8.3 \times 10^{-3} \text{ Rad/hr}$$

Therefore a fire consuming the entire inventory of the waste building would result in a Whole Body gamma dose rate at the site boundary of approximately 8 mrem/hr, or less.

Fire in Off-Gas Charcoal Beds

Release of material from the Off-gas charcoal beds may occur over a period of 2 hours (Reg. Guide 1.98). Activity available in the first charcoal bed has been calculated (at equilibrium, equivalent of operation at 100,000 micro Ci/sec nominal 30 minute hold-up) as 1008 Ci. Conservatively assuming the same activity in each of 6 beds, and an additional 300 Ci in the pre-absorber, activity available is 6348 Ci.

39. Radiological Consequences of a Fire (Continued)

Assuming release over a 2-hour period:

$$\frac{6348 \text{ Ci}}{2 \text{ hrs} \times 3600 \text{ sec/hr}} = 0.88 \text{ Ci/sec}$$

For a ground level release, assuming Pasquill Category F, with wind-speed of 1 m/sec, χ/Q at 1500 meters is 2×10^{-4} sec/m^3 (Reg. Guide 1.98, Figure 1).

$$Q \times \chi/Q = 0.88 \text{Ci/sec} \times 2 \times 10^{-4} \text{ sec/m}^3 = 1.76 \times 10^{-4} \text{ Ci/m}^3$$

Assuming calculated average gamma energy of 0.48 mev:

$$D = 0.25\,\overline{E} \quad = 0.25 \times 0.48 \times 1.76 \times 10^{-4} = 2.1 \times 10^{-5} \text{Rad/sec}$$

$$2.1 \times 10^{-5} \text{Rad/sec} \times 3600 \text{ sec/hr} = 7.6 \times 10^{-2} \text{ Rad/hr}$$

Therefore a fire consuming the entire inventory of the charcoal beds would produce no more than 76 mrem/hr at the site boundary. The actual result would be far less, due to:

a) assuming all release at ground level, rather than by the ventilation route out the stack, for this calculation

b) assuming the most conservative meteorology for this calculation. Wind speed at this site is rarely as low as 1 meter/sec.

c) normal station operation is less than 500 micro Ci/sec (30 minute holdup level) bed loading.

d) Also a high temperature in the Offgas System would be annunciated in the Control Room. The Shift Operator can isolate the system, thus extinguishing the fire. Therefore, the release would not continue for two hours.

QUESTION:

PF-1 Fire Door Supervision

Fire doors to safety-related areas or areas posing a fire hazard to safety-related areas should be normally closed and locked or electrically supervised with delayed alarm and annunciation in the control room.

RESPONSE:

At the present time all fire doors to safety-related and vital areas are locked and alarmed in the control room. These doors alarm in the main Control Room and in the Security Building.

There are three (3) fire doors that are within safety related areas that are not locked and alarmed. They are:

a) Door between 102 & 103 Diesel Generators elevation 261 feet
b) Door between 102 Diesel Generator and 102 Power Board elevation 261 feet
c) Door between 102 & 103 Power Boards elevation 261 feet

These doors have door closures on them and slam closed upon release. Doors are marked with signs indicating each is a fire door. For personnel safety reasons, these doors will not be provided with locks because they are needed to provide two exits from the area.

QUESTION:

PF-2 Electrical Cable Penetration Qualification (D.3)

The cable penetration fire barriers should be tested to demonstrate a three-hour rating, as is required for fire barriers. The test should be performed or witnessed by a representative of a qualified independent testing laboratory, and should include the following:

(1) The tests should be performed in accordance with ASTM E-119 and the following conditions.

(2) The cables used in the test should include the cable insulation materials used in the facility.

(3) The test sample should be representative of the worst case configuration of cable loading, cable tray arrangement, anchoring and penetration fire barrier size and design. The test sample should also be representative of the cable sizes in the facility. Testing of the penetration fire barrier in the floor configuration will qualify the fire stop for use in the wall configuration also.

(4) Cables penetrating the fire barrier should extend at least three feet on the unexposed side and at least one foot on the exposed side.

(5) The fire barrier should be tested in both directions unless the fire barrier is symmetrical.

(6) The fire barrier should be tested with a pressure differential across it that is equivalent to the maximum pressure differential a fire barrier in the plant is expected to experience.

(7) The temperature levels of the cable insulation, cable conductor, cable tray, conduit, and fire stop material should be recorded for the unexposed side of the fire barrier.

(8) Acceptance Criteria - The test is successful is:

(a) The cable penetration fire barrier has withstood the fire endurance test without passage of flame or ignition of cables on the unexposed side for a period of three hours, and

(8) (b) The temperature levels recorded for the unexposed side are analyzed and demonstrate that the maximum temperature is sufficiently below the cable insulation ignition temperature, and

(c) The fire barrier remains intact and does not allow projection of water beyond the unexposed surface during the hose stream test.

If previous tests can be shown to meet the above position, the licensee should provide the results of the tests to show that the above position is met.

RESPONSE:

Nine Mile Point Unit 1 will comply with this staff position as discussed in Responses 25 and 26.

QUESTION:

PF-3 Smoke Detection Systems Tests

In-situ tests should be conducted with a suitable smoke generation device to verify that the products of combustion from a fire would be promptly detected by installed smoke detectors and that ventilation air flow pattern in the area do not significantly reduce or prevent detection response. Bench tests should be conducted to verify that smoke detectors will provide prompt response and have adequate sensitivity to the products of combustion for the combustibles in the area where smoke detectors are installed. If any fire detection systems are found to be inadequate, appropriate modifications should be made to provide adequate detection system performance.

RESPONSE:

At the present time smoke detectors of the ionization type are tested at six month intervals. Alternately, devices are fixed in place using halon gas application; and checked for sensitivity in place using a meter.

We are in the process of developing in cooperation with American Nuclear Insurers a field test employing smoke generation that will be responsive and produce meaningful results for system evaluation of installed smoke detectors.

QUESTION:

PF-4 Battery Room Ventilation Air Flow Monitor

If not presently provided, a ventilation air flow monitor should be installed in each of the station battery rooms to alarm and annunciate, in the control room, the loss of ventilation air flow.

RESPONSE:

There will be smoke detectors in each battery room.

Hydrogen buildup is precluded by the continuously operating supply and exhaust ventilation for each battery room. This provides sufficient ventilation to maintain hydrogen concentration below 2%.

An alarm for loss of battery room ventilation will be installed to annunciate in the control room.

A006

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October 6, 1978

Director of Nuclear Reactor Regulation
Attn: Mr. Thomas A. Ippolito, Chief
Operating Reactors/Branch #3
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Ippolito:

Re: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Enclosed is the additional information requested in your July 10, 1978 letter concerning the Nine Mile Point Unit 1 Fire Protection Program.

Very truly yours,

NIAGARA MOHAWK POWER CORPORATION

Donald P. Dise

Donald P. Dise
Vice President-Engineering

NLR/szd

Enclosure