TABLE 2.4-5

REMOTE SHUTDOWN PANEL (RSP) INSTRUMENTATION

A. PANEL 1PL04J

INSTRUMENT NO.	DESCRIPTION
1FI-AF011B*	Auxiliary Feedwater Pump 1A Flow to Steam Generator 1A
1FI-AF013B*	Auxiliary Feedwater Pump 1A Flow to Steam Generator 1B
1FI-AF015B*	Auxiliary Feedwater Pump 1A Flow to Steam Generator 1C
1FI-AF017B*	Auxiliary Feedwater Pump 1A Flow to Steam Generator 1D
1LI-501	Steam Generator 1A Level
1LI-502	Steam Generator 1B Level
1LI-503	Steam Generator 1C Level
1LI-504	Steam Generator 1D Level
*	Essential Service Water Pump 1A Discharge Temperature
*	Essential Service Water Return Header OA Temperature
1PI-0514B	Steam Generator 1A Steam Pressure
1PI-0544B	Steam Generator 1D Steam Pressure

TABLE 2.4-5 (Cont'd)

B. PANEL 1PL05J

INSTRUMENT NO.	DESCRIPTION
1FI-AF012B*	Auxiliary Feedwater Pump 1B Flow to Steam Generator 1A
1FI-AF014B*	Auxiliary Feedwater Pump 1B Flow to Steam Generator 1B
1FI-AF016B*	Auxiliary Feedwater Pump 1B Flow to Steam Generator 1C
1FI-AF018B*	Auxiliary Feedwater Pump 1B Flow to Steam Generator 1D
1TI-RC005A	Reactor Coolant Loop 1A Hot Leg Temperature
1TI-RC006A	Reactor Coolant Loop 1B Hot Leg Temperature
1TI-RC007A	Reactor Coolant Loop 1C Hot Leg Temperature
1TI-RC008A	Reactor Coolant Loop 1D Hot Leg Temperature
1TI-RC005B	Reactor Coolant Loop 1A Cold Leg Temperature
1TI-RC006B	Reactor Coolant Loop 1B Cold Leg Temperature
1TI-RC007B	Reactor Coolant Loop 1C Cold Leg Temperature
1TI-RC008B	Reactor Coolant Loop 1D Cold Leg Temperature

TABLE 2.4-5 (Cont'd)

B. PANEL 1PL05J (Cont'd)

INSTRUMENT NO.	DESCRIPTION
*	Essential Service Water Pump 1B Discharge Temperature
*	Essential Service Water Return Header OB Temperature
1PI-0524B	Steam Generator 1B Steam Pressure
1PI-0534B	Steam Generator 1C Steam Pressure
1FT-0110*	Emergency Boron Injection Flow

C. PANEL 1PL06J

INSTRUMENT NO.	DESCRIPTION
1LI-0459B	Pressurizer Level
1LI-0460B	Pressurizer Level
1PI-0455B	Pressurizer Pressure
*	Volume Control Tank Level
*	Charging Header Pressure
1FI-0121B*	Charging Header Flow
1NI-NR001*	Source Range Neutron (NE-31) Indicator
1NI-NR002*	Source Range Neutron (NE-32) Indicator

TABLE 2.4-5 (Cont'd)

D. PANEL 2PL04J

INSTRUMENT NO.	DESCRIPTION
2FI-AF011B*	Auxiliary Feedwater Pump 2A Flow to Steam Generator 2A
2FI-AF013B*	Auxiliary Feedwater Pump 2A Flow to Steam Generator 2B
2FI-AF015B*	Auxiliary Feedwater Pump 2A Flow to Steam Generator 2C
2FI-AF017B*	Auxiliary Feedwater Pump 2A Flow to Steam Generator 2D
2LI-501	Steam Generator 2A Level
2LI-502	Steam Generator 2B Level
2LI-503	Steam Generator 2C Level
2LI-504	Steam Generator 2D Level
*	Essential Service Water Pump 2A Discharge Temperature
*	Essential Service Water Return Header OA Temperature
2PI-0514B	Steam Generator 2A Steam Pressure
2PI-0544B	Steam Generator 2D Steam Pressure

TABLE 2.4-5 (Cont'd)

E. PANEL 2PL05J

INSTRUMENT NO.	DESCRIPTION
2FI-AF012B*	Auxiliary Feedwater Pump 2B Flow to Steam Generator 2A
2FI-AF014B*	Auxiliary Feedwater Pump 2B Flow to Steam Generator 2B
2FI-AF016B*	Auxiliary Feedwater Pump 2B Flow to Steam Generator 2C
2FI-AF018B*	Auxiliary Feedwater Pump 2B Flow to Steam Generator 2D
2TI-RC005A	Reactor Coolant Loop 2A Hot Leg Temperature
2TI-RC006A	Reactor Coolant Loop 2B Hot Leg Temperature
2TI-RC007A	Reactor Coolant Loop 2C Hot Leg Temperature
2TI-RC008A	Reactor Coolant Loop 2D Hot Leg Temperature
2TI-RC005B	Reactor Coolant Loop 2A Cold Leg Temperature
2TI-RC006B	Reactor Coolant Loop 2B Cold Leg Temperature
2TI-RC007B	Reactor Coolant Loop 2C Cold Leg Temperature
2TI-RC008B	Reactor Coolant Loop 2D Cold Leg Temperature

TABLE 2.4-5 (Cont'd)

E. PANEL 2PL05J (Cont'd)

INSTRUMENT NO.	DESCRIPTION
*	Essential Service Water Pump 2B Discharge Temperature
*	Essential Service Water Return Header OB Temperature
2PI-0524B	Steam Generator 2B Steam Pressure
2PI-0534B	Steam Generator 2C Steam Pressure
2FT-0110*	Emergency Boron Injection Flow

F. PANEL 2PL06J

INSTRUMENT NO.	DESCRIPTION
2LI-0459B	Pressurizer Level
2LI-0460B	Pressurizer Level
2PI-0455B	Pressurizer Pressure
*	Volume Control Tank Level
*	Charging Header Pressure
2FI-0121B*	Charging Header Flow
2NI-NR001*	Source Range Neutron (NE-31) Indicator
2NI-NR002*	Source Range Neutron (NE-32) Indicator

*Not identified as a safe shutdown instrument.

TABLE 2.4-6

REMOTE SHUTDOWN PANEL CONTROLS

A. PANEL 1PL04J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
1AF005A	AFW Regulating Valve	1HK-AF031B	Position controller
1AF005B	AFW Regulating Valve	1HK-AF033B	Position controller
1AF005C	AFW Regulating Valve	1HK-AF035B	Position controller
1AF005D	AFW Regulating Valve	1HK-AF037B	Position controller
1AF013A	AFW Steam Generator Isolation Valve	1HS-AF071	Open-close switch
1AF013B	AFW Steam Generator Isolation Valve	1HS-AF073	Open-close switch
1AF013C	AFW Steam Generator Isolation Valve	1HS-AF075	Open-close switch
1AF013D	AFW Steam Generator Isolation Valve	1HS-AF077	Open-close switch
1AF01PA	AFW Pump 1A	1HS-AF003	On-off switch
1CV01PA	Centrifugal Charging Pump 1A	1HS-CV001	On-off switch
1CV01PA-A	CCP 1A Lube Oil Pump	1HS-CV013	On-off switch
0CC01P	Component Cooling Pump O	0HS-CC001	On-off switch
1CC01PA	Component Cooling Pump 1A	1HS-CC001	On-off switch
1MS001A,D	Main Steam Isolation Valves 1A, 1D	1HS-MS143	Open-close switch

TABLE 2.4-6 (Cont'd)

A. PANEL 1PL04J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
1MS018A	Main Steam Atmospheric Relief Valve 1A	1PK-MS041B	Setpoint controller
1MS018D	Main Steam Atmospheric Relief Valve 1D	1PK-MS044B	Setpoint controller
1RC01PA	Reactor Coolant Pump 1A	1HS-RC001	On-off switch
1RC01PD	Reactor Coolant Pump 1D	1HS-RC004	On-off switch
1SX01PA	ESW Pump 1A	1HS-SX003	On-off switch
0SX02PA	ESW Makeup Pump 0A	0HS-SX009	On-off switch
0SX03CA	ESW Cooling Tower Fan 0A low speed	0HS-SX001	On-off switch
0SX03CB	ESW Cooling Tower Fan 0B low speed	0HS-SX002	On-off switch
0VC01CA	MCR Supply Fan 0A	0HS-VC111	On-off switch
0VC02CA	MCR Return Fan 0A	0HS-VC008	On-off switch
0VC18Y,19Y, 20Y	MCR Outside Air Dampers	0HS-VC118	Open-close switch
0VC21Y,22Y, 43Y	MCR Charcoal Filter Iso. Dampers	0HS-VC120	Open-close switch
1VP01CA	Reactor Cont. Fan Cooler high speed	1HS-VP011	On-off switch
1VP01CC	Reactor Cont. Fan Cooler high speed	1HS-VP013	On-off switch

TABLE 2.4-6 (Cont'd)

B. PANEL 1PL05J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
1AF005E	AFW Regulating Valve	1HK-AF032B	Position controller
1AF005F	AFW Regulating Valve	1HK-AF034B	Position controller
1AF005G	AFW Regulating Valve	1HK-AF036B	Position controller
1AF005H	AFW Regulating Valve	1HK-AF038B	Position controller
1AF013E	AFW Steam Generator Iso. Valve	1HS-AF072	Open-close switch
1AF013F	AFW Steam Generator Iso. Valve	1HS-AF074	Open-close switch
1AF013G	AFW Steam Generator Iso. Valve	1HS-AF076	Open-close switch
1AF013H	AFW Steam Generator Iso. Valve	1HS-AF078	Open-close switch
1AF01PB	AFW Pump 1B	1HS-AF004	On-off switch
1CV01PB	Centrifugal Charging Pump 1B	1HS-CV002	On-off switch
1CV01PB-A	CCP 1B Lube Oil Pump	1HS-CV014	On-off switch
1CV8104	Emergency Boration Valve	1HS-CV005	Open-close switch
0CC01P	Component Cooling Pump 0	0HS-CC002	On-off switch
1CC01PB	Component Cooling Pump 1B	1HS-CC002	On-off switch
1MS001B,C	Main Steam Isolation Valves 1B, 1C	1HS-MS144	Open-close switch

TABLE 2.4-6 (Cont'd)

B. PANEL 1PL05J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
1MS018B	Main Steam Atmospheric Relief Valve 1B	1PK-MS042B	Setpoint controllers
1MS018C	Main Steam Atmospheric Relief Valve 1C	1PK-MS043B	Setpoint controller
1RC01PB	Reactor Coolant Pump 1B	1HS-RC002	On-off switch
1RC01PC	Reactor Coolant Pump 1C	1HS-RC003	On-off switch
1SXO1PB	ESW Pump 1B	1HS-SX004	On-off switch
0SX02PB	ESW Makeup Pump 0B	0HS-SX010	On-off switch
0SX03CE	ESF Cooling Tower Fan 0E low speed	0HS-SX005	On-off switch
0SX03CF	ESF Cooling Tower Fan 0F low speed	0HS-SX006	On-off switch
1VP01CB	Reactor Containment Fan Cooler - high speed	1HS-VPO12	On-off switch
1VP01CD	Reactor Containment Fan Cooler - high speed	1HS-VP014	On-off switch

TABLE 2.4-6 (Cont'd)

C. PANEL 1PL06J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
–	Plant Evacuation Alarm	1HS-CQ001	On switch
–	Plant-wide Fire Alarm	1HS-CQ002	On switch
–	Plant Evac. & Fire Alarm Reset	1HS-CQ003	Reset switch
1AB03P	Boric Acid Transfer Pump 1A	1HS-AB001	On-off switch
1CV8145	Pressurizer Auxiliary Spray Valve	1HS-CV039	Open-close switch
1CV8149A	Letdown Orifice Isolation Valve	1HS-CV007	Open-close switch
1CV8149B	Letdown Orifice Isolation Valve	1HS-CF009	Open-close switch
1CF8149C	Letdown Orifice Isolation Valve	1HS-CV011	Open-close switch
1CV02P	Position Displacement Charging Pump	1HS-CV017	On-off switch
1CV-LCV459	Letdown Isolation Valve	1HS-CV019	Open-close switch
1CV-LCV460	Letdown Isolation Valve	1HS-CV021	Open-close switch
1CV02P	P. D. Charging Pump	1SHC-459B	Pump speed controller
1CV-FCV121	Charging flow control valve	1FHC-121	Flow controller

TABLE 2.4-6 (Cont'd)

C. PANEL 1PL06J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
–	Steam Generator 1A Level	1LSH-FW047	SG high level alarm
–	Steam Generator 1B Level	1LSH-FW048	SG high level alarm
–	Steam Generator 1C Level	1LSH-FW049	SG high level alarm
–	Steam Generator 1D Level	1LSH-FW050	SG high level alarm
0PW02A	Primary Water Pump 0A	0HS-PW011	On-off switch
–	Press. Heaters Backup Group A Breaker	1HS-RY001	On-off switch
–	Press. Heaters Backup Group B Breaker	1HS-RY002	On-off switch
–	Press. Heaters Backup Group A Contactor	1HS-RY005	On-off switch
–	Press. Heaters Backup Group B Contactor	1HS-RY006	On-off switch
1VP03CA	CRDM Exhaust Fan 1A	1HS-VP112	On-off switch
1VP03CB	CRDM Exhaust Fan 1B	1HS-VP114	On-off switch
1VP03CC	CRDM Exhaust Fan 1C	1HS-VP116	On-off switch
1VP03CD	CRDM Exhaust Fan 1D	1HS-VP118	On-off switch

TABLE 2.4-6 (Cont'd)

D. PANEL 2PL04J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
2AF005A	AFW Regulating Valve	2HK-AF031B	Position controller
2AF005B	AFW Regulating Valve	2HK-AF033B	Position controller
2AF005C	AFW Regulating Valve	2HK-AF035B	Position controller
2AF005D	AFW Regulating Valve	2HK-AF037B	Position controller
2AF013A	AFW Steam Generator Isolation Valve	2HS-AF071	Open-close switch
2AF013B	AFW Steam Generator Isolation Valve	2HS-AF073	Open-close switch
2AF013C	AFW Steam Generator Isolation Valve	2HS-AF075	Open-close switch
2AF013D	AFW Steam Generator Isolation Valve	2HS-AF077	Open-close switch
2AF01PA	AFW Pump 2A	2HS-AF003	On-off switch
2CV01PA	Centrifugal Charging Pump 2A	2HS-CV001	On-off switch
2CV01PA-A	CCP 2A Lube Oil Pump	2HS-CV013	On-off switch
0CC01P	Component Cooling Pump O	0HS-CC001	On-off switch
2CC01PA	Component Cooling Pump 2A	2HS-CC001	On-off switch
2MS001A,D	Main Steam Isolation Valves 2A, 2D	2HS-MS143	Open-close switch

TABLE 2.4-6 (Cont'd)

D. PANEL 2PL04J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
2MS018A	Main Steam Atmospheric Relief Valve 2A	2PK-MS041B	Setpoint controller
2MS018D	Main Steam Atmospheric Relief Valve 2D	2PK-MS044B	Setpoint controller
2RC01PA	Reactor Coolant Pump 2A	2HS-RC001	On-off switch
2RC01PD	Reactor Coolant Pump 2D	2HS-RC004	On-off switch
2SX01PA	ESW Pump 2A	2HS-SX003	On-off switch
0SX03CC	ESW Cooling Tower Fan 0C low speed	0HS-SX003	On-off switch
0SX03CD	ESW Cooling Tower Fan 0D low speed	0HS-SX004	On-off switch
2VP01CA	Reactor Cont. Fan Cooler high speed	2HS-VP011	On-off switch
2VP01CC	Reactor Cont. Fan Cooler high speed	2HS-VP013	On-off switch

TABLE 2.4-6 (Cont'd)

E. PANEL 2PL05J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
2AF005E	AFW Regulating Valve	2HK-AF032B	Position controller
2AF005F	AFW Regulating Valve	2HK-AF034B	Position controller
2AF005G	AFW Regulating Valve	2HK-AF036B	Position controller
2AF005H	AFW Regulating Valve	2HK-AF038B	Position controller
2AF013E	AFW Steam Generator Iso. Valve	2HS-AF072	Open-close switch
2AF013F	AFW Steam Generator Iso. Valve	2HS-AF074	Open-close switch
2AF013G	AFW Steam Generator Iso. Valve	2HS-AF076	Open-close switch
2AF013H	AFW Steam Generator Iso. Valve	2HS-AF078	Open-close switch
2AF01PB	AFW Pump 2B	2HS-AF004	On-off switch
2CV01PB	Centrifugal Charging Pump 2B	2HS-CV002	On-off switch
2CV01PB-A	CCP 2B Lube Oil Pump	2HS-CV014	On-off switch
2CV8104	Emergency Boration Valve	2HS-CV005	Open-close switch
0CC01P	Component Cooling Pump 0	0HS-CC004	On-off switch
2CC01PB	Component Cooling Pump 2B	2HS-CC002	On-off switch
2MS001B,C	Main Steam Isolation Valves 2B, 2C	2HS-MS144	Open-close switch

TABLE 2.4-6 (Cont'd)

E. PANEL 2PL05J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
2MS018B	Main Steam Atmospheric Relief Valve 2B	2PK-MS042B	Setpoint controllers
2MS018C	Main Steam Atmospheric Relief Valve 2C	2PK-MS043B	Setpoint controller
2RC01PB	Reactor Coolant Pump 2B	2HS-RC002	On-off switch
2RC01PC	Reactor Coolant Pump 2C	2HS-RC003	On-off switch
2SXO1PB	ESW Pump 2B	2HS-SX004	On-off switch
0SX03CG	ESF Cooling Tower Fan 0G low speed	0HS-SX007	On-off switch
0SX03CH	ESF Cooling Tower Fan 0H low speed	0HS-SX008	On-off switch
2VP01CB	Reactor Containment Fan Cooler - high speed	2HS-VPO12	On-off switch
2VP01CD	Reactor Containment Fan Cooler - high speed	2HS-VP014	On-off switch

TABLE 2.4-6 (Cont'd)

F. PANEL 2PL06J

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
--	Plant Evacuation Alarm	2HS-CQ001	On switch
--	Plant-wide Fire Alarm	2HS-CQ002	On switch
--	Plant Evac. & Fire Alarm Reset	2HS-CQ003	Reset switch
2AB03P	Boric Acid Transfer Pump 2A	2HS-AB001	On-off switch
2CV8145	Pressurizer Auxiliary Spray Valve	2HS-CV039	Open-close switch
2CV8149A	Letdown Orifice Isolation Valve	2HS-CV007	Open-close switch
2CV8149B	Letdown Orifice Isolation Valve	2HS-CF009	Open-close switch
2CF8149C	Letdown Orifice Isolation Valve	2HS-CV011	Open-close switch
2CV02P	Position Displacement Charging Pump	2HS-CV017	On-off switch
2CV-LCV459	Letdown Isolation Valve	2HS-CV019	Open-close switch
2CV-LCV460	Letdown Isolation Valve	2HS-CV021	Open-close switch
2CV02P	P. D. Charging Pump	2SHC-459B	Pump speed controller
2CV-FCV121	Charging flow control valve	2FHC-121	Flow controller

TABLE 2.4-6 (Cont'd)

F. PANEL 2PL06J (Cont'd)

EQUIPMENT NUMBER	DESCRIPTION	CONTROL NUMBER	CONTROL FUNCTION
–	Steam Generator 2A Level	2LSH-FW047	SG high level alarm
–	Steam Generator 2B Level	2LSH-FW048	SG high level alarm
–	Steam Generator 2C Level	2LSH-FW049	SG high level alarm
–	Steam Generator 2D Level	2LSH-FW050	SG high level alarm
0PW02B	Primary Water Pump 0B	0HS-PW013	On-off switch
–	Press. Heaters Backup Group A Breaker	2HS-RY001	On-off switch
–	Press. Heaters Backup Group B Breaker	2HS-RY002	On-off switch
–	Press. Heaters Backup Group A Contactor	2HS-RY005	On-off switch
–	Press. Heaters Backup Group B Contactor	2HS-RY006	On-off switch
2VP03CA	CRDM Exhaust Fan 2A	2HS-VP112	On-off switch
2VP03CB	CRDM Exhaust Fan 2B	2HS-VP114	On-off switch
2VP03CC	CRDM Exhaust Fan 2C	2HS-VP116	On-off switch
2VP03CD	CRDM Exhaust Fan 2D	2HS-VP118	On-off switch

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
to provide protection for structures, systems, and components important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe shutdown of the plant.	
(3) Responsibility for the overall fire protection program should be assigned to a person who has management control over all organizations involved in fire protection activities. Formulation and assurance of program implementation may be delegated to a staff composed of personnel prepared by training and experience in fire protection and personnel prepared by training and experience in nuclear plant safety to provide a balanced approach in directing the fire protection program for the nuclear power plant.	Administrative procedures identify the individual delegated the authority for establishing the Fire Protection program. He has nuclear plant safety expertise available as part of the operating department.
The staff should be responsible for:	
(a) Fire protection program requirements, including consideration of potential hazards associated with postulated fires, with knowledge of building layout and systems design.	Using the prefire plans for safety-related areas, hazards are defined, structures and system identified. The Fire Marshall (as administrator) maintains the plans.
(b) Post-fire shutdown capability.	The Shift Manager is responsible for operating safely and can order shutdown if he deems it necessary for safety.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(c) Design, maintenance, surveillance, and quality assurance of all fire protection features (e.g., detection systems, suppression systems, barriers, dampers, doors, penetration seals, and fire brigade equipment).	Maintenance and surveillance are handled by the station Operating, Maintenance and Engineering programs and procedures. Offsite QA is a separate organization. Onsite QA organization provides review of maintenance, and purchase activities in accordance with the corporate QA Manual.
(d) Fire prevention activities (administrative controls and training).	The Fire Marshall and Training Department direct training.
(e) Fire brigade organization and training.	The Fire Marshall administers the station fire protection program (see 3.1. a(2))
(f) Prefire planning.	Prefire plans are written for safety-related areas and are controlled by the Fire Marshall. Preplans were reviewed by a Fire Protection Engineer.
	Comply.
	1. Responsibility for the Fire Protection Program
	a. Initial Design and Construction Phase
	The fire protection system design for the EGC plants was developed by the project consulting engineer using members of his staff who were experienced in nuclear plant design.
	Exelon Generation Company is a member of Nuclear Electric Insurance Limited (NEIL) and therefore guidelines for fire protection design were provided in the NEIL Property Loss Prevention Standards for Nuclear Generating Stations.
	The building design was done by the consulting engineer. All design

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	drawings which were pertinent to fire protection were submitted to a fire protection consultant as required by NEIL for their review and comment. The fire protection consultant was employed by NEIL and was therefore independent of EGC. The comments on design information made by the fire protection consultant were submitted to EGC for their action. Exelon Generation Company reviewed the project consultants' design drawings and the fire protection consultants' comments. Judgments were made on a cost-benefit basis as to whether or not the fire protection features were to be incorporated into the plant. Consideration was given to the following plant features when evaluation of fire protection was made: a. plant and personnel safety, b. credibility of a fire or fire hazard, c. loss of generation because of fire loss, and d. protection of surrounding resulting from a fire.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	A Project Engineer who reported to the Project Engineering Manager coordinated fire protection design features at B/B. Likewise, a review of design and design changes was performed by a Fire Protection Engineer in the Nuclear Services Department and by Independent Fire Protection Engineers working under contract to EGC. Resumes for the reviewers are in Appendix A5.1. Surveillance tests were performed by the Project Construction Department and by the Station. The Fire Protection Engineers were involved in pre-operational and surveillance acceptance tests.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	b. Operating Phase Exelon Generation Company has a Fire Marshall and Fire Protection System Engineer at each nuclear plant. In addition, there are Fire Protection Engineers in the Corporate and/or site design engineering departments. 1. Properties and Equipment - The Fire Protection Engineers furnish information on underwriting standards, fire insurance rating standards and other information. When necessary, they arrange for procuring advice from outside fire prevention agencies or other outside sources. When necessary, they arrange and set up meetings to discuss and resolve any questions on current standards or fire protection equipment. 2. Fire Inspections - Site personnel, QA (Nuclear Oversight), and NEIL performs fire protection inspections of plant facilities. 3. Fire Fighting Equipment - The Station Fire Marshall sees that adequate fire fighting equipment is provided and that such equipment is maintained in good operating condition. 4. Tests - The station conducts tests of fire fighting equipment and automatic fire protection

SECTION NRC POSITION

IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE

systems to ensure that each is in good condition and operating satisfactorily. During normal or routine inspections, one or more of the following tests may be made:

a. alarm tests,

b. drain tests,

c. churning of fire pumps,

d. inspecting of control valves,

e. physical testing of fire pumps and yard hydrants,

f. checking or testing water deluge systems,

g. checking of automatic sprinkler systems, and

h. testing of standpipes and hoses.

5. Contacts - The Station Fire Marshall maintains company contacts with local fire departments. The Station Fire Marshall and the Fire Protection Engineers maintain contact with fire prevention organizations, insurance companies, and others on matters relating to fire fighting.

6. Reporting Fires - Fire reports are issued by the station. The Fire Marshall reports fires as necessary to the insurance company.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	7. Training of Personnel - The Station Training Department, Corporate Training Department, and Fire Marshall are responsible for personnel training. This is done to ensure that individuals trained become familiar with the operation and use of fire fighting equipment.
	8. Rules and Standards - The Fire Protection Engineers assist and advise departments concerned with established rules and standards relative to fire prevention and protection as may be necessary.
	9. Recommendations - On all recommendations initiated by insurance agencies, fire prevention organizations, and other outside activities or company departments, the Fire Protection Engineers investigate, evaluate, discuss, and review such recommendations, where necessary, before making final recommendations as to specific action to be taken.
	10. Design Change - All design changes are reviewed for impact upon the Fire Protection Program per administrative procedures.
	It is our opinion that the intent of the Branch Technical Position is met by the above outlined organizational structure in design, construction and operation of the EGC nuclear plants.
(4) The organizational responsibilities and lines of communication pertaining to fire protection should be defined between the various positions through the use of organizational charts and functional descriptions of each position's responsibilities. The following positions/organizations should be designated:	Administrative procedures define the organizational responsibilities and lines of communication for the Fire Protection Program.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(a) The upper level offsite management position which has management responsibility for the formulation, implementation, and assessment of the effectiveness of the nuclear plant fire protection program.	Administrative procedures identify the offsite-delegated individual responsible for the nuclear plant fire protection program. Assessment of the program is made by EGC Fire Protection Engineers.
(b) The offsite management position(s) directly responsible for formulating, implementing, and periodically assessing the effectiveness of the fire protection program for the licensee's nuclear power plant including fire drills and training conducted by the fire brigade and plant personnel. The results of these assessments should be reported to the upper level management position responsible for fire protection with recommendations for improvements or corrective actions as deemed necessary.	The Site Nuclear Oversight Manager and EGC Fire Protection Engineers have these responsibilities.
(c) The onsite management position responsible for the overall administration of the plant operations and emergency plans which include the fire protection and prevention program and which provide a single point of control and contact for all contingencies.	Administrative procedures identify the onsite-delegated individual responsible for the overall administration of the plant operations and emergency plans.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(d) The onsite position(s) which:	
i. Implements periodic inspections to: minimize the amount of combustibles in safety-related areas; determine the effectiveness of housekeeping practices; assure the availability and acceptable condition of all fire protection systems/equipment, emergency breathing apparatus, emergency lighting, communication equipment, fire stops, penetration seals, and fire retardant coatings; and assures the prompt and effective corrective actions are taken to correct conditions adverse to fire protection and preclude their recurrence.	Administrative Procedures require the Fire Marshall to conduct periodic plant tours, identify unacceptable conditions, and initiate corrective actions. The Fire Marshall is responsible for implementation and administration of the fire protection program. Administrative Procedures state that Radiation Protection department will control and maintain emergency breathing apparatus. Administrative Procedures state that Electrical Maintenance will maintain emergency lighting and communications. Fire barriers, seals, doors, and dampers will be inspected per Station procedures and surveillance. Administrative Procedures state that the Fire Marshall will investigate fires, evaluate prevention recommendations and make recommendation when needed.
ii. Is responsible for the fire fighting training for operating plant personnel and the plant's fire brigade; design and selection of equipment; periodic inspection and testing of fire protection systems and equipment in accordance with established procedures, and evaluate test results and determine the acceptability of the systems under test.	Fire brigade training is a responsibility of both the Fire Marshall and the training department. Operating personnel are trained periodically through the Training Department on fire fighting. The Operating Manager ensures all operating surveillance are done in accordance to required guides. The Maintenance, Engineering and Operating Managers are responsible for station procedures performed by their department.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	Fire Marshall will review the surveillances he deems necessary. Evaluation of tests and surveillances is specified in test, surveillance and administrative procedures.
	Fire Marshall is responsible for the purchase of fire brigade equipment.
iii. Assists in the critique of all fire drills to determine how well the training objectives have been met.	Critique of all fire drills is a responsibility of the Fire Marshall.
iv. Reviews and evaluates proposed work activities to identify potential transient fire loads.	The Fire Marshall will have these responsibilities.
v. Implements a program for indoctrination of all plant contractor personnel in appropriate administrative procedures which implement the fire protection program, and the emergency procedures relative to fire protection.	Contractor's training through NGET fulfills this requirement. They are informed of emergency procedures relative to fire protection.
vi. Implements a program for instruction of personnel on the proper handling of accidental events such as leaks or spills of flammable materials that are related to fire protection.	The Administrative procedures provide instructions for personnel on the proper handling of oil spills. These procedures reference corporate general instruction on spill prevention and counter measures.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(e) The onsite position responsible for fire protection quality assurance. This position should be responsible for assuring the effective implementation of the fire protection program by planned inspections, scheduled audits, and verification that the results of these inspections of audits are promptly reported to cognizant management personnel.	The Fire Protection Program identifies that Fire Protection Activities are treated as augmented quality per the QA program. Site/Off-Site QA (Nuclear Oversight) Department personnel conduct audits and surveillances to ensure proper implementation and administration of the Fire Protection Program.
(f) The positions which are part of the plant fire brigade:	
i. The plant fire brigade positions should be responsible for fighting fires. The authority and responsibility of each fire brigade position relative to fire protection should be clearly defined.	Administrative procedures define the Fire Chief and Brigade responsibilities and the requirements for authority and duties.
ii. The responsibilities of each fire brigade position should correspond with the actions required by the fire fighting procedures.	
iii. The responsibilities of the fire brigade members under normal plant conditions should not conflict with their responsibilities during a fire emergency.	Training will be scheduled through the Fire Marshall and Operating Department. Administrative Procedures specify personnel (non-brigade) required for operation.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
iv. The minimum number of trained fire brigade members available onsite for each operating shift should be consistent with the activities required to combat the most significant fire. The size of the fire brigade should be based upon the functions required to fight fires with adequate allowance for injuries.	Byron complies with BTP CMEB 9.5-1 paragraph 3.3.b and Appendix R III.H. which requires a 5 member brigade.
v. The recommendations for organization, training, and equipment of "Private Fire Brigades" as specified in NFPA No. 27-1975, including the applicable NFPA publications listed in the appendix to NFPA No. 27, are considered appropriate criteria for organizing, training, and operating a plant fire brigade.	See Table 3-1 for discussion of conformance with NFPA 27.
(5) Personnel Qualifications.	Comply.
(a) The position responsible for formulation and implementation of the fire protection program should have within his organization or as a consultant a fire protection engineer who is a graduate of an engineering curriculum of accepted standing and shall have completed not less than 6 years of engineering attainment indicative of growth in engineering competency and achievement, 3 years of which shall have been in responsible charge of fire protection engineering work. These requirements are the eligibility	The position responsible for the fire protection program has the use of a Fire Protection Consultant. These Consultants meet SFPE member grade requirements. Exelon Generation Company also employs Fire Protection Engineers who meet the qualifications for member grade in SFPE. (The Fire Protection Engineer's duties are identified in the Fire Protection Program administrative procedures.)

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
requirements as a Member in the Society of Fire Protection Engineers.	
(b) The fire brigade members' qualifications should include satisfactory completion of a physical examination for performing strenuous activity, and of the fire brigade training described in Position C.3.d.	The fire brigade members have an annual physical which shows them capable of unrestricted activity.
(c) The personnel responsible for the maintenance and testing of the fire protection systems should be qualified by training and experience for such work.	The personnel responsible for maintenance and testing of the fire protection systems receive training scheduled by the training department.
(d) The personnel responsible for the training of the fire brigade should be qualified by training and experience for such work.	The initial training of the fire brigade was administered by State of Illinois licensed instructors.
(6) The following NFPA publications should be used for guidance to develop the fire protection program:	The administrative procedures needed for maintaining the performance of the fire protection system and personnel were established with the guidance of the NFPA standard available at the time. The organization of fire protection services and the review of their performance is one of the functions of the station administration.
No. 4 - "Organization for Fire Services"	
No. 4A - "Organization of a Fire Department"	
No. 6 - "Industrial Fire Loss Prevention"	See Table 3-1 for discussion of conformance with the listed NFPA publications.
No. 7 - "Management of Fire Emergencies"	
No. 8 - "Management Responsibilities for Effects of Fire on Operations"	

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
No. 27 - "Private Fire Brigades"	
(7) On sites where there is an operating reactor and construction or modification of other units is underway, the superintendent of the operating plant should have the lead responsibility for site fire protection.	Comply. Position Description procedures define this as a duty of the station manager.
b. Fire Hazards Analysis	
The fire hazards analysis should demonstrate that the plant will maintain the ability to perform safe shutdown functions and minimize radioactive releases to the environment in the event of a fire.	Comply. The overall fire protection program is based on evaluation of fire hazards so a safe shutdown can be accomplished. The fire protection program began with the protection of specific hazards in mind, to minimize, or prevent the loss of property. The main emphasis is now placed on safe plant shutdown, but the protection of ALL hazards will satisfy both reasons. Not ALL hazards are protected or separated as indicated in other sections of the report, but the basis for the fire protection program basically complies.
The fire hazards analysis should be performed by qualified fire protection and reactor systems engineers to (1) consider potential in situ and transient fire hazards; (2) determine the consequences of fire in any location in the plant on the ability to safely shut down the reactor or on the ability to minimize and control the release of radioactivity to the environment; and (3) specify measures for fire prevention, fire detection, fire suppression, and fire containment and alternative shutdown capability as required for each fire area containing structures, systems, and components important to safety that are in conformance with NRC guidelines and regulations.	Fire hazards were considered in plant design for Byron/Braidwood Units 1 and 2. The cable separation criteria for the plant is described in Appendix 5.2 of this report. The fire protection system is discussed in Appendix 5.4. Deviations from the compliance criteria of 10 CFR 50 Appendix R are listed and justified in Table A5.7-1.
"Worst case" fires need not be postulated to be simultaneous with nonfire-related failures in safety systems, plant	

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
i. Control the use of specific combustibles in safety-related areas. All wood used in safety-related areas during maintenance, modification, or refueling operation (such as lay-down blocks or scaffolding) should be treated with a flame retardant. Equipment or supplies (such as new fuel) shipped in untreated combustible packing containers may be unpacked in safety-related areas if required for valid operating reasons. However, all combustible materials should be removed from the area immediately following unpacking. Such transient combustible material, unless stored in approved containers, should not be left unattended during lunch breaks, shift changes, or other similar periods. Loose combustible packing materials such as wood or paper excelsior, or polyethylene sheeting should be placed in metal containers with tight-fitting self-closing metal covers.	Comply with exceptions. Refer to Section III.K.8 of Appendix A5.7 for details.
j. Disarming of fire detection or fire suppression systems should be controlled by a permit system. Fire watches should be established in areas where systems are so disarmed.	Comply. Disarming of fire detection or fire suppression systems is controlled by administrative procedure. A fire watch or other compensatory measures are established as required by the governing administrative procedure.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
k. Successful fire protection requires testing and maintenance of the fire protection equipment and the emergency lighting and communication. A test plan that lists the individuals and their responsibilities in connection with routine tests and inspections of the fire detection and protection systems should be developed. The test plan should contain the types, frequency, and detailed procedures for testing. Procedures should also contain instructions on maintaining fire protection during those periods when the fire protection system is impaired or during periods of plant maintenance, e.g., fire watches or temporary hose connections to water systems.	Comply. The scope of the job classification for maintenance personnel identifies job responsibilities in the area of fire protection. Disarming of fire detection or fire suppression systems for maintenance is controlled by administrative procedure. A fire watch or other compensatory measures are established as required by the governing administrative procedure. The surveillance program (Test Plan) contains the types, frequency, and detailed procedures for testing.
l. Control actions to be taken by an individual discovering a fire, for example, notification of control room, attempt to extinguish fire, and actuation of local fire suppression systems.	Comply. Refer to Section III.K.9 of Appendix A5.7.
m. Control actions to be taken by the control room operator to determine the need for brigade assistance upon report of a fire or receipt of alarm on control room annunciator panel, for example, announcing location of fire over PA system, sounding fire alarms, and notifying the shift supervisor and the fire brigade leader of the type, size, and location of the fire.	Comply. Refer to Section III.K.10 of Appendix A5.7.

3.3 FIRE BRIGADE

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
a. The need for good organization, training, and equipping of fire brigades at nuclear power plant sites requires that effective measures be implemented to ensure proper discharge of these functions. The guidance in Regulatory Guide 1.101, "Emergency Planning for Nuclear Power Plants," should be followed as applicable.	The guidelines of Regulatory Guide 1.101 are followed where applicable. Insurance industry standards in existence at that time and NFPA 27- "Private Fire Brigades" - were consulted in writing the procedures. Station administrative procedures governing the fire protection program outlines the organization, training and the equipping of the fire brigades.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
b. A site fire brigade trained and equipped for fire fighting should be established to ensure adequate manual fire fighting capability for all areas of the plant containing structures, systems, or components important to safety. The fire brigade should be at least five members on each shift. The brigade leader and at least two brigade members should have sufficient training in or knowledge of plant safety-related systems to understand the effects of fire and fire suppressants on safe shutdown capability. The qualification of fire brigade members should include an annual physical examination to determine their ability to perform strenuous fire fighting activities. The shift supervisor should not be a member of the fire brigade. The brigade leader shall be competent to assess the potential safety consequences of a fire and advise control room personnel. Such competence by the brigade leader may be evidenced by possession of an operator's license or equivalent knowledge of plant safety-related systems.	Comply, with one exception taken. Refer to Section III.H of Appendix A5.7 for details.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(7) Drills	
(a) Fire brigade drills should be performed in the plant so that the fire brigade can practice as a team.	Items 7a through 7f under (7) drills are accomplished by administrative procedure that includes drill and drill assessments. Refer to Section III.I.3 of Appendix A5.7 for details.
(b) Drills should be performed at regular intervals not to exceed 3 months for each shift fire brigade. Each fire brigade member should participate in each drill, but must participate in at least two drills per year. A sufficient number of these drills, but not less than one for each shift fire brigade per year, should be unannounced to determine the fire fighting readiness of the plant fire brigade, brigade leader, and fire protection systems and equipment. Persons planning and authorizing an unannounced drill should ensure that the responding shift fire brigade members are not aware that a drill is being planned until it is begun. Unannounced drills should not be scheduled closer than 4 weeks. At least one drill per year should be performed on a "back shift" for each shift fire brigade.	

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
And arrangement of a fire that could reasonably occur in the area selected, allowing for fire development due to the time required to respond, to obtain equipment, and organize for the fire, assuming loss of automatic suppression capability.	
iv. Assessment of brigade leader's direction of the fire fighting effort as to thoroughness, accuracy, and effectiveness.	
(8) Records	
Individual records of training provided to each fire brigade member, including drill critiques, should be maintained for at least 3 years to ensure that each member receives training in all parts of the training program. These records of training should be available for NRC review. Retraining or broadened training for fire fighting within buildings should be scheduled for all those brigade members whose performance records show deficiencies.	Comply. Refer to Section III.I.4 of Appendix A5.7.
(9) Guidance Documents	
NFPA 27, "Private Fire Brigade," should be followed in organization, training, and fire drills. This standard also is applicable for the inspection and maintenance of	Comply. Fire training by responsible instructors is done periodically. See Table 3-1 for delineation of conformance with NFPA 27. NFPA 197 has been renumbered NFPA 1410, deals with public fire departments, and is not applicable at the station level.

3.4 QUALITY ASSURANCE PROGRAM

SECTION NRC POSITION

The quality assurance (QA) programs of applicants and contractors should ensure that the guidelines for design, procurement, installation, and testing and the administrative controls for the fire protection systems for safety-related areas are satisfied. The QA program should be under the management control of the QA organization. This control consists of (1) formulating a fire protection QA program that incorporates suitable requirements and is acceptable to the management responsible for fire protection or verifying that the program incorporates suitable requirements and is acceptable to the management responsible for fire protection, and (2) verifying the effectiveness of the QA program for fire protection through review, surveillance, and audits. Performance of other QA program functions for meeting the fire protection program requirements may be performed by personnel outside of the QA organization. The QA program for fire protection should be part of the overall plant QA program. It should satisfy the specific criteria listed below.

IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE

The fire protection systems at Byron Station Units 1 and 2 are addressed in two different manners under the Quality Assurance Program.

1. Fire protection systems classed as safety-related are covered by the entire Quality Assurance Program which includes the criteria set forth in Appendix B of 10 CFR 50.

2. Fire protection systems that are classed as non-safety-related and that are awarded after September 1, 1978 are procured and installed in accordance with the Branch Technical Position 9.5-1. Vendors awarded with supplying or installing a fire protection system after September 1, 1978 must have an approved QA Program as required by the Quality Assurance Program and be on the Approved Bidder's List.

   However, exceptions may be made for selected non-safety-related systems to allow installation without an approved QA program. Each installation of this type requires a separate analysis that

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	includes, as a minimum, a regulatory change evaluation; a definable augmented quality class break point, such as an isolation valve; and a hydraulic evaluation for added sprinklers or fire hose stations, as applicable. The applicable fire and building codes (such as NFPA codes) will be followed and a fire protection engineer will review the change.
	Scheduled fire protection inspections are conducted under the direction of QA (Nuclear Oversight) and with direct participation by a qualified fire protection engineer consultant. New designs or revisions to plant fire protection systems are reviewed as outlined in the response to Section 3.1.
	The Quality Assurance Program applies to procurement, design, installation, modifications and maintenance activities involving fire protection systems. As such, each specific criteria listed as "a" through "j" of Section NRC Position are covered by the Quality Assurance

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
d. Inspection A program for independent inspection of activities affecting fire protection should be established and executed by or for the organization performing the activity to verify conformance with documented installation drawings and test procedures for accomplishing the activities.	d. Independent inspections are performed by Quality Assurance (Nuclear Oversight), utilizing fire protection consultants, as required. At Byron, periodic inspections are performed on fire-rated penetration seals. Inspection of the interface between exterior electrical conduit surfaces and the fire barrier are performed as part of the periodic fire barrier inspection. This conduit/barrier interface consists of an approved material specified by typical details on design drawings, which restores the barrier after the conduit has been installed in accordance with the QA Program. At the request of the Byron NRC Resident Inspector in May 2000, one sample conduit penetration in a masonry block wall in the Unit 2 4KV Switchgear Room was examined to verify its installation conforms to the design detail. It was confirmed that the conduit/barrier interface was installed during initial installation as specified in the design drawing. See also Section C.4.i for a discussion of Records associated with the installation of conduit/barrier interfaces.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
e. Test and Test Control A test program should be established and implemented to ensure that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests should be performed in accordance with written test procedures; test results should be properly evaluated and acted on.	e. Tests of fire protection equipment and systems are included in regularly scheduled station operating surveillance procedures. These procedures and test results are reviewed and evaluated by appropriate station personnel. QA (Nuclear Oversight) also audits this area.
f. Inspection, Test, and Operating Status Measures should be established to provide for the identification of items that have satisfactorily passed required tests and inspections.	
g. Nonconforming Items Measures should be established to control items that do not conform to specified requirements to prevent inadvertent use or installation.	

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
h. Corrective Action Measures should be established to ensure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformances, are promptly identified, reported, and corrected.	h. Tests of fire protection equipment and systems are included in regularly scheduled operating surveillance procedures. Nonconforming equipment is identified as a result of their test and corrective action taken to rectify any deficiencies as provided by the QA Program.
i. Records Records should be prepared and maintained to furnish evidence that the criteria enumerated above are being met for activities affecting the fire protection program.	i. Documentation involving the fire protection program is retained in a central file or QA vault as provided by the QA Program. Records of fire-rated barriers and fire-rated penetration seals are maintained in accordance with the QA Program. Individual installation records for each internal conduit non-combustible seal, cable tray fire stop, mechanical penetration seal, and other fire-rated seals are maintained in accordance with the QA Program. The sealing interface between exterior electrical conduit surfaces and a fire barrier is not considered an individual fire seal. Installation records of this interface are a part of the fire barrier QA records.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
j. Audits Audits should be conducted and documented to verify compliance with the fire protection program, including design and procurement documents, instructions, procedures and drawings, and inspection and test activities.	j. Scheduled audits and surveillances of the fire protection activities in our plants are performed in accordance with the QA Program by the Nuclear Oversight Department.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
located 20 feet from the exposed face.	
(4) Penetration openings for ventilation systems should be protected by fire dampers having a rating equivalent to that required of the barrier (see NFPA-90A, "Air Conditioning and Ventilating Systems"). Flexible air duct coupling in ventilation and filter systems should be noncombustible.	Ventilation system penetrations in rated barriers are protected by fire dampers having a rating equivalent to that of the barrier. For details, see the Fire Protection Report Subsection 2.1.4.1b and c. See Table 3-1 for delineation of conformance with NFPA-90A.
(5) Door openings in fire barriers should be protected with equivalently rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory. Such doors should be self-closing or provided with closing mechanisms and should be inspected semiannually to verify that automatic hold-open, release, and closing mechanisms and latches are operable. (See NFPA 80, "Fire Doors and Windows.")	Access doors in fire barriers are Label A or B fire doors or are of Label A or B construction (see Section 2.1, page 2.1-8 for a detailed discussion of doors provided for rated fire barriers). See Table 3-1 for delineation of conformance with NFPA 80:
One of the following measures should be provided to ensure they will protect the opening as required in case of fire:	All fire doors have automatic closers. Options a, b, and d are used on various doors in the plant. Cable spreading room interior doors alarm in the control room. The other supervised doors are monitored by security.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(a) Fire doors should be kept closed and electrically supervised at a continuously manned location;	
(b) Fire doors should be locked closed and inspected weekly to verify that the doors are in the closed position;	Locked fire doors are inspected every 31 days, based upon historical analysis of plant specific records (document identification number DG99-000873).
(c) Fire doors should be provided with automatic hold-open and release mechanisms and inspected daily to verify that doorways are free of obstructions; or	
(d) Fire doors should be kept closed and inspected daily to verify that they are in the closed position.	Unlocked fire doors are inspected every 7 days, based upon historical analysis of plant specific records (document identification number DG99-000873).
The fire brigade leader should have ready access to keys for any locked fire doors.	The brigade chief can obtain a key to access all areas.
Access protected by automatic total flooding gas suppression systems should have electrically supervised self-closing fire doors or should satisfy option (a) above.	The diesel generator day tank rooms and the auxiliary feedwater diesel driven pump and day tank rooms are not electrically supervised, although they are protected by automatic total flooding gas suppression systems. The fire doors to these rooms are surveilled to ensure they are in their proper positions.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(6) Personnel access routes and escape routes should be provided for each fire area. Stairwells outside primary containment serving as escape routes, access routes for firefighting, or access routes to areas containing equipment necessary for safe shutdown should be enclosed in masonry or concrete towers with a minimum fire rating of 2 hours and self-closing Class B fire doors.	The stairwells at Byron which serve as escape routes for station personnel and access routes for fire-fighting personnel, as per the requirements of building codes, are enclosed by 2-hour fire rated masonry walls with self-closing fire doors, and are clearly marked.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(7) Fire exit routes should be clearly marked.	Comply, see item 6 above.
(8) Each cable spreading room should contain only one redundant safety division. Cable spreading rooms should not be shared between reactors. Cable spreading rooms should be separated from each other and from other areas of the plant by barriers having a minimum fire resistance of 3 hours.	The Byron design complies, except for instances where cables from both safety divisions are routed in the same cable spreading room. Fire Protection Report Section 2.4.2 describes the measures taken in these areas to assure safe shutdown.
(9) Interior wall and structural components, thermal insulation materials, radiation shielding materials, and soundproofing should be noncombustible.	Minor amounts of combustibles are used as architectural finish materials. These existing materials do not significantly contribute to the fire loading in the plant, and do not expose safety-related systems to undue risks.
Materials that are acceptable for use as interior finish without evidence of test and listing by a nationally recognized laboratory are the following:	
Plaster, acoustic plaster, gypsum plasterboard (gypsum wallboard), either plain, wallpapered, or painted with oil- or water-base paint;	
Ceramic tile, ceramic panels;	
Glass, glass blocks;	
Brick, stone, concrete blocks, plain or painted;	
Steel and aluminum panels, plain, painted, or enameled;	
Vinyl tile, vinyl-asbestos tile, linoleum, or asphalt tile on concrete floors.	

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE

fire suppression system should be installed in the fire area.

(3) If the guidelines of Positions C5.b.1 and C5-b.2 cannot be met, then alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided.

c. Alternative or Dedicated Shutdown Capability

(1) Alternative or dedicated shutdown capability provided for a specific fire area should be able to achieve and maintain subcritical reactivity conditions in the reactor, maintain reactor coolant inventory, achieve and maintain hot standby* conditions for a PWR (hot shutdown* for a BWR) and achieve cold shutdown* conditions within 72 hours and maintain cold shutdown conditions thereafter. During the postfire shutdown, the reactor coolant system process variables shall be maintained within those predicted for a loss of normal ac power, and the fission product boundary integrity shall not be affected; i.e., there shall be no fuel clad damage, rupture, or any primary coolant boundary, or rupture of the containment boundary.

*As defined in the Technical Requirements Manual

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
and shall accommodate postfire conditions where offsite power is available and where offsite power is not available for 72 hours. Procedures shall be in effect to implement this capability.Comply.	
(4) If the capability to achieve and maintain cold shutdown will not be available because of fire damage, the equipment and systems comprising the means to achieve and maintain the hot standby or hot shutdown condition shall be capable of maintaining such conditions until cold shutdown can be achieved. If such equipment and systems will not be capable of being powered by both onsite and offsite electric power systems because of fire damage, an independent onsite power system shall be provided. The number of operating shift personnel, exclusive of fire brigade members, required to operate such equipment and systems shall be onsite at all times.	Comply.
(5) Equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs shall be readily available onsite and procedures shall be in effect to implement such repairs. If such equipment and systems used prior to 72 hours after the fire will not be capable of being powered by	Comply. Repair procedures have been prepared to cover any repairs required. All materials and equipment needed to make these repairs will be maintained onsite.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
both onsite and offsite electric power systems because of fire damage, an independent onsite power system should be provided. Equipment and systems used after 72 hours may be powered by offsite power only.	
(6) Shutdown systems installed to ensure postfire shutdown capability need not be designed to meet seismic Category I criteria, single failure criteria, or other design basis accident criteria, except where required for other reasons, e.g., because of interface with or impact on existing safety systems, or because of adverse valve actions due to fire damage.	Comply.
(7) The safe shutdown equipment and systems for each fire area should be known to be isolated from associated circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment. The separation and barriers between trays and conduits containing associated circuits of one safe shutdown division and trays and conduits containing associated circuits or safe shutdown cables from the redundant division, or the isolation of these associated circuits from the safe shutdown equipment, should be such that a postulated fire involving associated circuits will not prevent safe shutdown.	Comply. There are no associated circuits as defined in IEEE 384-1974 at B/B. Associated circuits as defined in the NRC's April 6, 1982 clarification letter to Generic Letter 81-12 are addressed in Subsection 2.4.1.6.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
portable hand extinguishers should be provided. Safety-related cable trays of a single division that are separated from redundant divisions by a fire barrier with a minimum rating of 3 hours and are normally accessible for manual firefighting should be protected from the effects of a potential exposure fire by providing automatic water suppression in the area where such a fire could occur. Automatic area protection, where provided, should consider cable tray arrangements and possible transient combustibles to ensure adequate water coverage for areas that could present an exposure hazard to the cable system. Manual hose standpipe systems may be relied upon to provide the primary fire suppression (in lieu of automatic water suppression systems) for safety-related cable trays of a single division that are separated from redundant safety divisions by a fire barrier with a minimum rating of 3 hours and are normally accessible for manual firefighting if all of the following conditions are met: (a) The number of equivalent* standard 24-inch-wide cable trays (both safety-related and nonsafety-related) in a given fire area is six or less;	cable tray system at Byron. Cables are not considered to be the primary fire hazard in any areas of the plant except the cable spreading rooms, and therefore they do not have specific fire suppression systems provided, except for the cable spreading rooms. However, cable trays are protected by the detection and/or manual suppression equipment provided for areas where they are located. Refer to Section 2.3 for detailed discussion of each fire zone.

*Trays exceeding 24 inches should be counted as two trays; trays exceeding 48 inches should be counted as three trays, regardless of tray fill.

3.6 FIRE DETECTION AND SUPPRESSION

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
a.	Fire Detection Protection	
(1)	Detection systems should be provided for all areas that contain or present a fire exposure to safety-related equipment.	Comply with exceptions. See Table 2.2-3.
(2)	Fire detection systems should comply with the requirements of Class A systems as defined in NFPA 72D, "Standard for the Installation, Maintenance, and Use of Proprietary Protective Signaling Systems," and Class 1 circuits as defined in NFPA 70, "National Electrical Code."	Comply, see Appendix 5.4.. See Table 3-1 for delineation of conformance to NFPA 72D.
(3)	Fire detectors should be selected and installed in accordance with NFPA 72E, "Automatic Fire Detectors." Preoperational and periodic testing of pulsed line-type heat detectors should demonstrate that the frequencies used will not affect the actuation of protective relays in other plant systems.	Comply. Line type heat detectors are not used, in general, at B/B except in most charcoal filters and all outdoor transformers. See Table 3-1 for delineation of conformance to NFPA 72E.
(4)	Fire detection systems should give audible and visual alarm and annunciation in the control room. Where zoned detection systems are used in a given fire area, local means should be provided to identify which detector zone has actuated. Local audible alarms should sound in the fire area.	The fire detection system will give audible and visual alarm and annunciation in the control room. Local alarms are provided for areas with fixed suppression systems.
(5)	Fire alarms should be distinctive and unique so they will not be confused with any other plant system alarms.	Comply.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
from either or both. However, a failure in one tank or its piping should not cause both tanks to drain. Water supply capacity should be capable of refilling either tank in 8 hours or less.	
(10) Common tanks are permitted for fire and sanitary or service water storage. When this is done, however, minimum fire water storage requirements should be dedicated by passive means, for example, use of a vertical standpipe for other water services. Administrative controls, including locks for tank outlet valves, are unacceptable as the only means to ensure minimum water volume.	Not applicable.
(11) The fire water supply should be calculated on the basis of the largest expected flow rate for a period of 2 hours, but not less than 300,000 gallons. This flow rate should be based (conservatively) on 500 gpm for manual hose streams plus the largest design demand of any sprinkler or deluge system as determined in accordance with NFPA 13 or NFPA 15. The fire water supply should be capable of delivering this design demand over the longest route of the water supply system.	Comply. The original calculations on the fire protection system were based on a line break that creates the greatest friction loss in the system per NEIL requirements. This has the same effect as delivering water over the longest route even though the longest route was not considered in the calculation. It would take four line breaks to restrict the flow to only the longest route. See Table 3-1 for delineation of conformance to NFPA 13 and NFPA 15.
(12) Freshwater lakes or ponds of sufficient size may qualify as sole source of water for fire protection but require separate redundant suctions in one or more intake structures. These supplies should be separated so that a failure of one supply will not result in a failure of the other supply.	Comply. At Byron, the natural draft cooling tower basin serves as the sole source of water for fire protection. As described in a January 6, 1983 letter from T. R. Tramm to H. R. Denton responding to a CMEB request, the required volume of fire protection water will always be available from this source.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
Particular consideration should also be given to:	
(1) Minimum required CO_2 concentration, distribution, soak time, and ventilation control;	Concentration and hold times are verified by a vendor test during the construction phase. Ventilation is controlled by fire dampers with electrothermal links.
(2) Anoxia and toxicity of CO_2;	In addition to a pre-discharge alarm for personnel protection, an odorizer has been added to the CO_2 systems, which adds a wintergreen odor to the CO_2.
(3) Possibility of secondary thermal shock (cooling) damage;	
(4) Conflicting requirements for venting during CO_2 injection to prevent overpressurization versus sealing to prevent loss of agent; and	
(5) Location and selection of the activating detectors.	
f. Portable Extinguishers	
Fire extinguishers should be provided in areas that contain, or could present a fire exposure hazard to, safety-related equipment in accordance with guidelines of NFPA 10, "Portable Fire Extinguishers, Installation, Maintenance and Use." Dry chemical extinguishers should be installed with due consideration given to possible adverse effects on safety-related equipment installed in the area.	See Table 3-1 for delineation of conformance with NFPA 10.

3.7 GUIDELINES FOR SPECIFIC PLANT AREAS

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
a. Primary and Secondary Containment	
(1) Normal Operation - Fire protection requirements for the primary and secondary containment areas should be provided for hazards identified by the fire hazards analysis.	Byron complies except as identified below.
Examples of such hazards include lubricating oil or hydraulic fluid system for the primary coolant pumps, cable tray arrangements and cable penetrations, and charcoal filters. Because of the general inaccessibility of primary containment during normal plant operation, protection should be provided by automatic fixed systems. The effects of postulated fires within the primary containment should be evaluated to ensure that the integrity of the primary coolant system and the containment is not jeopardized assuming no action is taken to fight the fire.	Fixed automatic suppression is not provided. Hose stations and portable extinguishers are available throughout the containment. Ionization detectors provide local coverage over cable penetrations. Heat detectors are provided over the reactor coolant pumps. The charcoal filter units within containment are provided with manual deluge systems. Temperature switches provide detection alarms to the control room for the charcoal units.
(a) Operation of the fire protection systems should not compromise the integrity of the containment or other safety-related systems. Fire protection activities in the containment areas should function in conjunction with total containment requirements such as ventilation and control of contaminated liquid and gaseous release.	Comply. Manual hose stations are relied upon for primary suppression inside the containment. Safety-related equipment inside the containment is qualified for a post-LOCA environment, including water spray. Firefighting activities are thus not expected to adversely affect safe shutdown components or the containment integrity.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
All cables that enter the control room should terminate in the control room. That is, no cabling should be routed through the control room from one area to another. Cables in underfloor and ceiling spaces should meet the separation criteria necessary for fire protection.	Comply. All cables that enter the control room terminate in the control room. The ESF Division 11 cables enter from the ceiling and ESF Division 12 cables enter from the floor. Cable separation is defined in IEEE Standard 384-1974 and NRC Regulatory Guide 1.75.
Air-handling functions should be ducted separately from cable runs in such spaces; i.e., if cables are routed in underfloor or ceiling spaces, these spaces should not be used as air plenums for ventilation of the control room. Fully enclosed electrical raceways located in such underfloor and ceiling spaces, if over 1 square foot in cross-sectional area, should have automatic fire suppression inside. Area automatic fire suppression should be provided for underfloor and ceiling spaces if used for cable runs unless all cable is run in 4-inch or smaller steel conduit or the cables are in fully enclosed raceways internally protected by automatic fire suppression.	Comply, except as explained below. Ceiling and floor are not used as a plenum. Ducts are not used for cable runs. There are no electrical cable trays located under floor and ceiling spaces. This is currently also true for the raised floor in the Byron computer room, which is part of the control room complex. There are some conduits above the dropped ceiling. Upper cable spreading room has automatic halon and lower cable spreading room has automatic CO_2. Upper cable spreading room has a manual CO_2 system as a backup.
There should be no carpeting in the control room.	Carpeting in the main control room has a Class 1 rating.
c. Cable Spreading Room	
The primary fire suppression in the cable spreading room should be an automatic water system such as closed-head sprinklers, open-head deluge system, or open directional water spray system. Deluge and open spray systems should have provisions for manual operation at a	Comply, except as explained below: The Byron design includes several cable spreading rooms at elevation 439'-0" and 463'-4-1/2". The rooms are designed such that redundant safe shutdown cabling is routed through separate rooms (except as noted in Section 2.4.2) and isolated by 3-hour fire barriers. The upper cable spreading rooms are protected

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
remote station; however, there should be provisions to preclude inadvertent operation. Location of sprinkler heads or spray nozzles should consider cable tray arrangements and possible transient combustibles to ensure adequate water coverage for areas that could present exposure hazards to the cable system. Cables should be designed to allow wetting down with water supplied by the fire suppression system without electrical faulting.	by an automatic Halon 1301 system with a manual CO_2 backup system. Manual hose stations and portable extinguishers provide additional backup. The lower cable spreading areas are protected by an automatic CO_2 System. Backup is provided by manual hose stations and portable extinguishers. The Halon and CO_2 systems as installed at Byron meet the requirements of the governing NFPA codes 12 and 12A.
Open-head deluge and open directional spray system should be zoned. The use of foam is acceptable. Cable spreading rooms should have: (1) At least two remote and separate entrances for access by fire brigade personnel;	Cable spreading rooms 3.3B-1 and 3.3B-2 have only one access door. The BTP position is that an automatic water suppression system should be installed in the cable spreading rooms. The Byron system provides adequate fire protection in the cable spreading rooms without an automatic water system. Hose stations are available for use in the cable spreading rooms if required.
(2) An aisle separation between tray stacks at least 3 feet wide and 8 feet high; (3) Hose stations and portable extinguishers installed immediately outside the room; (4) Area smoke detection; and (5) Continuous line-type heat detectors for cable trays inside the cable spreading room. Drains to remove firefighting water should be provided. When gas systems are installed,	An automatic water suppression system was not installed in the cable rooms because of concerns about the probability and effects of inadvertent actuations. The thermal elements in the Fenwall rate compensated heat detectors are very similar to the thermal elements in the automatic water suppression systems. Since a cable fire would generate large quantities of smoke in a very early stage of a fire, the ionization detectors would be very effective in detecting small cable fires and annunciating in the Control Room. If the fire was of such magnitude that the thermal detectors sensed the fire, the actuation of the fire suppression system would then be initiated. The

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	provide localized control without the effects to the general area which could result from actuation of a deluge system. As shown in the Byron Fire Protection Report, hose stations are located in each compartment of the upper and lower cable spreading areas. Hose stations are located adjacent to each doorway so that application of water is available. In summary, the Byron cable spreading area fire protection system design ensures that fire will not compromise plant safety. Use of automatic halon or CO_2 systems instead of water deluge reduces the probability of a plant shutdown or equipment damage in the event of a spurious actuation. Additionally, the area is well supplied with manual hose stations and portable hand extinguishers.
d. Plant Computer Rooms Computer rooms for computers performing safety-related functions that are not part of the control room complex should be separated from other areas of the plant by barriers having a minimum fire resistance rating of 3 hours and should be protected by automatic detection and fixed automatic suppression. Computers that are part of the control room complex but not in the control room should be separated and protected as described in Position C.7.b. Computer cabinets located in the control room should be protected as other control room equipment and cable runs therein. Non-safety-related computers outside the control room complex should be separated	The process computer at Byron is non-safety-related and is part of the control room complex. Automatic fixed suppression is not provided. Fire protection features which are provided are described in Subsection 2.3.4 of this report.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
and alarm locally. Ventilation systems in the battery rooms should be capable of maintaining the hydrogen concentration well below 2 vol-%. Loss of ventilation should be alarmed in the control room. Standpipe and hose and portable extinguishers should be readily available outside the room.	counterpart and other fire zones by 3-hour rated fire barriers. Detectors do not alarm locally.
h. Turbine Building The turbine building should be separated from adjacent structures containing safety-related equipment by a fire barrier with a minimum rating of 3 hours. The fire barriers should be designed so as to maintain structural integrity even in the event of a complete collapse of the turbine structure. Openings and penetrations in the fire barrier should be minimized and should not be located where the turbine oil system or generator hydrogen cooling system creates a direct fire exposure hazard to the barrier. Considering the severity of the fire hazards, defense in depth may dictate additional protection to ensure barrier integrity.	The Applicant complies with this position with one exception. The complete collapse of the turbine building structure is not a design basis event for the Byron plant. This building, although not a Category I structure, is designed for the SSE and other Category I loads. Fire protection features are adequate to prevent a fire of sufficient severity to threaten the integrity of the structure from developing.
i. Diesel Generator Areas Diesel generators should be separated from each other and from other areas of the plant by fire barriers having a minimum fire resistance rating of 3 hours.	Comply, except as noted below: UV detectors do not alarm locally. Thermal detectors do not alarm locally prior to CO_2 discharge.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
j. Diesel Fuel Oil Storage Areas Diesel fuel oil tanks with a capacity greater than 1,100 gallons should not be located inside buildings containing safety-related equipment. If above-ground tanks are used, they should be located at least 50 feet from any building containing safety-related equipment or, if located within 50 feet, they should be housed in a separate building with construction having a minimum fire resistance rating of 3 hours. Potential oil spills should be confined or directed away from buildings containing safety-related equipment. Totally buried tanks are acceptable outside or under buildings (see NFPA 30, "Flammable and Combustible Liquids Code," for additional guidance). Above-ground tanks should be protected by an automatic fire suppression system.	Comply, except as noted below: Diesel fuel oil tanks are located within the auxiliary building. See Table 3-1 for delineation of conformance with NFPA 30. The outdoor above-ground diesel fuel oil storage tanks (located more than 50 feet away from any building containing safety-related equipment) are not protected by an automatic fire suppression system. Potential fuel oil spills are confined within a berm. Manual suppression capability from nearby hydrants will prevent the fire from spreading from the berm.
k. Safety-Related Pumps Pump houses and rooms housing redundant safety-related pump trains should be separated from each other and from other areas of the plant by fire barriers having at least 3-hour ratings. These rooms should be protected by automatic fire detection and suppression unless a fire hazards analysis can demonstrate that a fire will not endanger other safety-related equipment required for safe plant shutdown. Fire detection should alarm and annunciate in the control room and alarm locally. Hose	Comply, except as noted below: Most safety-related pumps are located in the auxiliary building. Most pumps are located in individual rooms separated from other plant areas by walls of substantial construction, but which generally do not carry fire ratings. Automatic fire detection is provided for all pumps, but automatic suppression is in general not provided. Refer to the applicable portions of Sections 2.3 and 2.4 of this Fire Protection Report for a description of individual pumps and the fire hazards and safe shutdown analyses.

TABLE 3-1

NFPA CODE DEVIATION REPORT

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 10, 1981 Edition - Portable Extinguishers (Cont'd)					
1-1, 2 (S)*	10-1981-4-3.1		Extinguishers shall be inspected monthly.	Extinguishers are inspected quarterly, except for fire extinguishers located inside the containment building during at-power conditions.	Performance based historical reviews of previously performed monthly inspections have demonstrated few inspection failures, sufficient to justify extending the inspections to a quarterly basis. This evaluation was conducted in accordance with the approved administrative procedure for "Performance Based Evaluation for Fire Protection". During at-power conditions, access to the containment building is controlled administratively to prevent unauthorized entry. There is very small risk that fire extinguishers located within the containment will be tampered with or removed during at-power conditions. An inspection of fire extinguishers will be performed at the beginning of each plant refueling outage.

TABLE 3-1

NFPA CODE DEVIATION REPORT

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 10, 1981 Edition - Portable Extinguishers (Cont'd)					
1-1, 2 (S)*	10-1981-4-4.1		Extinguishers shall be subjected to maintenance not more than 1 year apart.	Comply, except for extinguishers located inside the containment building during at-power conditions.	During at-power conditions, access to the containment building is controlled adminstratively to prevent unauthorized entry. There is very small risk that fire extinguishers located within containment will be tampered with during at-power conditions. Maintenance or replacement of fire extinguishers inside the containment building will be performed at the beginning of each plant refueling outage.

TABLE 3-1

NFPA CODE DEVIATION REPORT

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 10, 1981 Edition - Portable Extinguishers (Cont'd)					
1-1, 2 (S)*	10-1981-4-4.3		Extinguishers shall have a tag or label securely attached.	Comply, except for fire extinguishers located inside the containment building.	Fire extinguishers located inside the containment building will not have an attached inspection/maintenance tag. Tags capable of being routinely signed and dated are not compatible with the plant requirement to prohibit potential debris that may clog the containment recirculation sump. The extinguisher inspection and maintenance data sheets from plant procedures provide retrievable records of the required inspections and maintenance and satisfy the intent of the code for the fire extinguishers located within the containment building.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 11, 1983 Edition - Foam Systems					
18.20-0(NS)	(Previous NFPA 11 review recommendations are deleted because the foam system previously protecting the outdoor fuel oil storage tank has been abandoned and is no longer used.)				

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 11, 1983 Edition - Foam Systems (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 12, 1980 Edition - Carbon Dioxide					
All CO_2 Systems (S&NS)	12-1980-1-10.3.2	1	Provide the hydrostatic test pressure used on the valves controlling the low pressure CO_2 systems.		M&MPC will obtain and approve the required information prior to 5% power.
All CO_2 Systems	12-1980-1-11.2	2	Verify that all carbon dioxide systems will be thoroughly inspected and tested at least annually.		System demonstration procedure was reviewed; will be 18 month surveillance. This frequency is considered to be satisfactory.
8.3-1 18.11-0	12-1980-1-9.6.1	5	Verify that the CO_2 storage tanks (10 ton and 2 ton) were tested and marked in accordance with specifications of ASME for unfired pressure vessels.		Station will obtain vendor information. M&MPC will revie by 5% power to verify the tanks meet the applicable ASME requirements.
9.1-1, 9.2-1, 9.3-1, 9.4-1, 11.4 A-1(S)	12-1980-1-8.3.8	7	Fuel supply should be automatically shut off to the diesel generators and diesel driven auxiliary feedwater pump in case of fire in those areas.		Diesel engine is required for safe shutdown and fuel will not be interlocked to shut off. The room is protected by automatic CO_2 in the event of a fire.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 12, 1980 Edition - Carbon Dioxide (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 12A, 1980 Edition - Halon 1301 Fire Extinguishing Systems					
13.0(NS)	NFPA 12A-1980 1-7.4	6	The completed system shall be tested to meet the approval of the authority having jurisdiction.	To assure that the freon substitute test gas provided a meaningful test, list the weight(s) of the freon for the 1/28/81 test.	Station will obtain weight of freon test gas from Viking by 5% power.
13.0(NS)	NFPA 12A-1980	8	Plans and specifications shall include all pertinent items necessary for the proper design.	The Viking 1/28/81 test report refers to 1-100 lb reserve halon cylinder; however, there is no reserve backup for this system.	Investigate why Viking referred to a 100 lb reserve cylinder and then revise test report accordingly by 5% power.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 12A, 1980 Edition - Halon 1301 Fire Extinguishing Systems (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 13 - Sprinkler Systems					
All zones sprinklered All System	13-1983 2-9.2.2	1	Gauges on system risers shall have a maximum limit not less than twice the normal working pressure.	Gauges on riser are 300 psi.	Gauges with pressure of 300 psi are considered more than adequate on the systems in the plant.
Stairwell sprinklers in 3 fire (S) zones Aux. Bldg. P-18	13-1983 1-8.1.1	2	Only approved devices should be installed on sprinkler systems (shutoff valve).	"N" stamped and approved (UL) may not be available. The valve fits the description in NFPA 13 other than it closes much faster than the required 5 seconds.	Present valve arrangement does not compromise system integrity. U.L. listed valves will not be installed in lieu of "N" stamp valves.
8.3-2(NS) 8.5-2(NS)	13-1989 4-4.18	3.1	Baffles shall be installed whenever sprinklers are less than 6 ft. apart to prevent the sprinkler opening first from wetting adjoining sprinklers.	Spacing criteria is not met on certain hatchway sprinklers. Ref. Drawings M-603, Sht. 5, M-18, M-31, and M-35.	Sidewall sprinklers are shielded by structural steel from the upright sprinkler discharge.
8.6-0	13-1983 3-8.4	-	For sprinklers installed in pendant position below ceiling, return bend shall be used when the water supply is from a raw water source. When water supply is potable, return bends are not required.	Pendant style sprinklers for Unit 2 startup bldg. are locking return bends.	Resolved to the fact that the system is adequately flushed, main drain tests are performed quarterly (further flushing the system piping) and the water supply is strained through a screen prior to its introduction into the system.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 13 - Sprinkler Systems					
All zones(S) sprinklered	13-1983 3-13.1.3	8	Sprinkler system fittings should be examined to determine if they are of the heavy pattern type due to pressure on systems exceeding 175 psi.		The design of the pipe and fittings has been verified to be adequate for the maximum operating pressure of the system.
All zones with sprinkers	13-1983 3-14.1.2	-	Drain valves and test valves shall be listed type of 175 psi cold water pressure rating.	Some drain valves and test valves are not UL listed.	The original valves were supplied with a rating of 200lb per specification F-2817, piping design table 083BB. Alternative valves have been installed in accordance with table 083BB with a pressure rating of 400 psi water, oil, gas. This pressure rating is adequate for the maximum operating pressure of the FP system.

Note: Some areas could not be visually inspected due to obstructions and measurements could not be obtained. These areas were reviewed against as-built drawings indicating piping dimensions and no deviations were observed in the sprinkler systems.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 13 - Sprinkler Systems (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 13 - Sprinkler Systems (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 13A, 1981 Edition - Inspection, Testing, and Maintenance of Sprinkler System					
All Sprinklered Zones (S&NS)	13A-1981-3-5.1.1	1	A stock of 24 sprinklers should be maintained at all times including all temperature types that are utilized in the plant.		Will be done by 5% power. Sprinklers have been ordered.
All Exterior Zones (S&NS)	13A-1981-2-7.3.1	4	Quarterly each post indicator valve should be given a "spring" or torsion test.		Monthly the station will verify that lock is on and annually will open and close valve. This is considered adequate.
All Exterior Zones	13A-1981-2-1.21	-		NFPA 13A specifies a monthly inspection to verify that hydrants are not obstructed and that they are accessible, visible, and with caps in place.	Yard hydrants are inspected annually to NFPA 25 inspection, test, and maintenance requirements.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose					
All	14-1983-4-43.3	1	Each hose reel or hose rack throughout the station should be provided with a label affixed to include "Fire Hose for Use by Occupants" and operating instructions.		Fire hose will be utilized by trained fire brigade personnel only. Other than red color coded piping, no further instructions will be provided.
All	14-1983-4-2.1	3	Verification should be made to assure that all existing angle valves on the standpipe systems are U.L. listed or F.M. approved.	Could not find listing on Anderson Greenwood Co. Valves. Other valves have no Mfg. NA. or Model No.	Existing valves do not compromise system integrity. Section III valves are required and will remain in place, as these valves are considered of equal quality to a listed valve.
All	14-1983-7-5.1.3	5	Verification should be made to assure that fittings used on the standpipe systems are "extra-heavy" where pressures exceed 175 psi.		The design of the pipe and fittings has been verified to be adequate for the maximum operating pressure of the system.
All	14-1983-4-7.1	8	The flowing pressures at hose outlets exceed 100 psi each. Outlet shall be provided with an approved device to reduce to reduce the pressure with required flow at the outlet to 100 psi.		Fire brigade members are being trained for working pressures in excess of 150 psi. Brigade training is being documented.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					
All	14-1983-7-7.1	10	An approved 3-1/2" dial spray pressure gauge should be provided at the top of each standpipe. Gauges shall be located in a suitable place where water will not freeze. Each gauge will be controlled by a valve having arrangements for draining.	The purposes of these gauges is to assure that minimum pressure requirements at the hose stations are met.	The normal operating pressures of the fire protection system have been reviewed and calculations indicate adequate pressure will be maintained. Therefore the gauges are not considered necessary.
	14-1983-4.1.1 and 4-3.1 and 4-4.1	11	Elevation No. 412 in containment No. 1 is adequately covered by hose connections from other levels. Elevation No. 412 does not have any hose connection in containment.		Elevation 412' is adequately covered by hose stations from adjacent levels in containment.
	14-1983-4-4.3.4	12	All nozzles for Class II service hose throughout the plant should be listed for use on Class A, B, and C fires.		All nozzles have been replaced with properly listed nozzles, except for fuel handling building due to NRC not allowing spray nozzles.
12.1-0	14-1983-4-4.3.4	15	Replace the straight-steam nozzles on hose reels 170, 171, and 173 with U.L. listed nozzles rated for Class A, B, and C fires. These hose stations are located in fuel handling areas.		Solid stream nozzles will remain in fuel handling areas.
(NS)	14-1983-5-2.3	19	The water supply for the hose connections in the "River Screen House" is not automatic. Revisions to the water supply should be made to provide an automatic water supply capable for supplying the streams first operated until the secondary sources can be brought into action.	A call must be made to control room to start pump.	No revisions to be made. M&M has accepted current design.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					
	14-1983-4-2.1	27	Provide a U.L. listed valve at the standpipe outlet of hose station 270 for attachment of hose.		Non-listed valve does not affect operability of hose station.
	14-1983-4-4.3.2	28	Verification should be made on all hose racks to assure they are suitable for the hose installed. Each rack should be U.L. listed for lined or unlined hose.	Check hose rack at station Nos. 179, 180, 256, 263, 264, 184, 265, and 178. U.L. listed replacement hose reels are no longer available. They will be replaced with similar nonlisted hose reels, as needed.	Complete. Fire hose is used by trained fire brigade personnel only. Nonlisted hose reels do not affect the firefighting performance of the hose station.
	14-1983-2-1.3.1 and 2-1.3.2	40	Verification should be made on all standpipe under 50 ft in height to be a minimum of 2 inches in size and all in excess of 50 ft shall be at least 2-1/2 in. in size.		M&MPC has determined existing design is acceptable.
	14-1983-2-1.3 and 5-4.1	41	Verification should be made to assure that all Class II standpipe systems are sized for a minimum flow of 100 gpm for 30 minutes. Where one or more standpipes are required, all common supply piping should be hydrostatically sized for a minimum flow of 100 gpm. The supply shall be sufficient to maintain a residual pressure of 65 psi at the topmost outlet of each standpipe.		The normal operation pressures of the fire protection system have been reviewed and calculations indicate that adequate pressure and flow will be maintained.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 14, 1983 Edition - Standpipe and Hose (Cont'd)					

THIS PAGE IS INTENTIONALLY BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 15, 1983 Edition - Water Spray Systems					
18.10E-1(NS)	15-1983-2-1.1	1	A cock handle should be installed on the alarm test connection for the water spray system protecting the system auxiliary transformer 142-1.		An operator will carry a valve handle during testing and attach it to the stem. This would guard against malicious operation.
8.3-1, 18.10A-1, 18.10B-1, 18.10C-1, 18.10D-1, 18.10E-1(NS)	15-1983-2-5.1	2	The Viking model D-5 deluge valves for the water spray systems protecting the transformers, lube oil storage tank, and turbine bearings are listed for maximum working pressures of 175 psi. The static pressure on the systems was approximately 180 psi. Higher pressure fittings should be used on these systems.	A static pressure slightly above the working pressure would probably not be harmful to the equipment. Higher pressure rated valves and fittings should not be needed if the static stays not more than 5 to 10 psi above the rated working pressure of 175 psi.	Static pressure slightly above the working pressure would not be harmful to the equipment.
18.10A-1, 18.10B-1, 18.10C-1, 18.10D-1, 18.10E-1(NS)	15-1983-2-1.2	3	The equipment used to automatically actuate the transformer water spray systems should be listed by Underwriters' Laboratories for the purpose. The heat detection equipment is not listed in the 1983 Fire Protection Equipment directory.		The detection equipment only supply on alarm function and do not actuate the water spray. Thus the unlisted equipment is considered acceptable.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 15, 1983 Edition - Water Spray Systems (Cont'd)					
11.7-0(S)	15-1983-4-3	10	The thermostat sensing line on the charcoal filter water spray systems should extend farther than two filter sections to cover the hazard.	There are approximately 6 sections each with 9 levels of filter trays.	Detection has been redesigned and will be installed by 5% power.
18.10A-1, 18.10B-1, 18.10C-1, 18.10D-1, 18.10E-1(NS)	15-1983-4-3	11	The transformer water spray systems should operate automatically upon actuation of the heat detection system for proper hazard protection.	The only automatic operation is on failure of the transformer.	Station does not intend redesign. Actuation of deluge valve trips transformer.
All(NS)	15-1983-8-6	14	Provide water spray system test data to verify that, under test conditions, heat detectors operate within 40 seconds when exposed to standard heat test source.		Detector test procedure will be revised by 5% power. Test procedure will require work request to be initiated if response times are in excess of maximum allowable time specified in 1-3-85 M&M letter.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 15, 1983 Edition - Water Spray Systems (Cont'd)					
All	15-1983-6-2.5	15	Verify that water spray system control valves and automatic detection equipment is tested at least annually.		Procedures require testing to be conducted every 18 months. This is considered adequate.
All	15-1983-6-2.6	16	Verify that manual tripping devices and valves for water spray systems are operated at least annually.		Procedures require testing to be conducted every 18 months. This is considered adequate.
All	15-1983-6-2.8	17	Verify that all spray nozzles are visually inspected and cleaned, if necessary, at least annually.		Procedures established for 18-month surveillance. This is considered adequate.
All	15-1983-6-1.3	20	Provide the frequency of regularly scheduled plant inspections at which water spray equipment is to be visually checked.		Procedure for 18 months surveillance has been written. This is considered adequate.
All	15-1983-4-6.2	21	Verify that provisions are made for effective drainage of water from the filter area during the operation of the systems.		Drains are purposely closed. Operators would manually open drains upon system operation.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 15, 1983 Edition - Water Spray Systems (Cont'd)					

INTENTIONALLY IS LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 16, 1980 Edition - Foam Water Systems					
10.1-1, 10.2-1(S)	16-1980-2-1	1	All component parts including the foam water sprinkler system shall be listed.	The A-20 activator is pneumatic but is hydraulically supplied. Valves were noted not to be listed. The Alison control panel is not listed.	Listing of these valves is not considered necessary since this system will be manually actuated. S&L and M&MPC will demonstrate that panels are functionally equivalent to listed panels prior to 5% power.
10.1-1, 10.2-1(S)	16-1980-4-3.3	2	All fittings shall be listed for pressures greater than 175 psig.		The design of the pipe and fittings has been verified to be adequate for the maximum operating pressure of the system.
10.1-1, 10.2-1(S)	16-1980-5-2	4	Verification should be given that hydrostatic testing has been conducted at 50 psig over the fire pump's churn.	System pressure relief set at 180 psi.	Hydrostatic testing at 225 psi is considered adequate.
10.1-1, 10.2-1(S)	16-1980-7-1.1	5	The foam water sprinkler system shall be serviced by qualified personnel semiannually.	Procedures are for servicing every 18 months.	The procedure has been reviewed and approved (including a review by M&MPC).

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 20, 1984 Edition - Fire Pumps					
18.12-0	20-1983-2-7.1	1	The electrical motor-driven fire pump shall be protected against possible interruption of service.	Protected by distance and redundancy.	The electric fire pump is detached a minimum of 34 feet from a possible oil fire exposure from the circulating water pumps. The electric pump is also backed up by a redundant diesel engine-driven fire pump that is located and protected in a 3-hour fire-rated room.
18.12-0	20-1983-7-1.1.1	6	The electric motor-driven fire pump controller shall be listed for electric motor-driven service.	The controller is not listed.	Justification has been provided to the NRC in a December 14, 1983 letter from T. R. Tramm to H. R. Denton.
18.12-0	20-1983-7-1.1.3	7	The electric motor-driven fire pump controller shall be marked to show manufacturer's name and complete electrical rating.		Manufacturer's label not required. Refer to justification noted above.
18.13-0	20-1983-8-2.7.2	10	The automatic electric solenoid valve located in the exchanger supply line for the OB fire pump diesel engine should be specifically listed for fire protection service.		Existing design justified, "UL" does not label solenoid valve in the required range.
18.13-0	20-1983-8-6.1	-		NFPA 20 specifies a weekly run of engines for not less than 30 minutes.	The diesel engine fire pump will be started from ambient conditions and operated for greater than or equal to 30 minutes every 31 days.
18.12-0 & 18.13-0	20-1983-11-4.5	-		NFPA 20 specifies the units are to be operated weekly.	The motor- and diesel-driven fire pumps are operated every 31 days.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 20, 1984 Edition - Fire Pumps (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 20, 1984 Edition - Fire Pumps (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
Note NFPA 24, 1981 Edition - Fire Mains and Hydrants					
Outside Ring Header	24-1981-3-3.2	1	The following post-indicator valve (PIVs) are located closer than 40 ft to the buildings: OFP 560 OFP 559 OFP 561 OFP 577	Not practical to relocate.	Isolation capabilities are considered adequate.
Outside Ring Header	24-1981-4-2.2	3	The following hydrants are located closer than 40 ft to buildings they are protecting: OFP 10S OFP 12S OFP 13S OFP 23S	Not practical to relocate.	Loss of any single hydrant does not affect building coverage.
Outside Ring Header	24-1981-5-1.3	4	The existing practice is to secure one 2-1/2-inch hose to the hydrant, but with the remaining part of the hose located in the hose house. The hose should be disconnected and completely stored in the hose house.		The hose houses have been removed. A dedicated fire response truck or cart is now maintained with hoses and equipment equivalent to three hose houses.
Outside Ring Header	24-1981-8-6.2.9	10	Documentation should be provided that substantiates the decision to omit thrust blocking on underground piping at tees, elbows, etc.	Welded underground piping except connections to hydrants.	Restraints not needed on welded piping; thrust blocking provided at hydrant connections.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
Note NFPA 24, 1981 Edition - Fire Mains and Hydrants (Cont'd)					
Outside Ring Header	24-1981-8-4	12	Check valves should be installed in connections between the fire protection water system and service water system.	These connections are normally closed and automatic check valves are not needed.	Service water systems are third order backup water supply and procedures have been written to monitor potential leakage of butterfly valves installed.
Outside Ring Header	24-1981-8-4	13	The butterfly isolation valves on the connections between fire protection water system and service water system should be UL listed.	These valves are on service water system and listing is not necessary.	Valves are ASME Section III. Leakage monitoring procedure addresses leakage concerns. No further action is required.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
Note NFPA 24, 1981 Edition - Fire Mains and Hydrants (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 26, 1983 Edition - Valve Supervision					
	26-1983-3-1	-		NFPA 26 specifies that locked open valves should be inspected monthly.	Locked open valves are inspected every 92 days to verify the valve is in the correct position.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 27, 1981 Edition - Private Fire Brigades					
	NFPA 27-1981 4.3	-	NFPA specifies training sessions should be held at least monthly for one hour or more per shift.	Training sessions are conducted quarterly.	Training sessions conducted quarterly result in a total of 12 hours of training per year for each brigade member. This level of training is considered as satisfying NFPA.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 30, 1981 Edition - Flammable Liquids Code					
8.2-1 Diesel lube oil drain tank 369(NS)	30-1981 2-4.2 30-1981 2-2.5	2	A 6.68" diameter emergency breather vent should be provided for the tank.	The subject tank is not safety-related and is not required for safe shutdown and a fire in this area will not affect safe shutdown of either unit. Area-wide automatic water suppression is provided for the area where this tank is located. The tank is provided with an existing vent.	The existing tank design will not be changed.
8.7B-0 Station Auxiliary Diesel F.O. Storage Tank(NS)	37-1979 5-5.3 30-1981 2-4.4.3	4	The liquid transfer connections beneath the liquid level of the tank should be provided with either (a) a normally closed remotely activated valve 95 or, (b) an automatic closing heat activated valve, or (c) another approved device to provide for quick cut-off of flow in the event of fire in the vicinity of the tank.		Heat activated valves will be added prior to the end of the first refueling outage.
8.7B-0 Station Auxiliary Diesel F.O. Storage Tank(NS)	37-1979 5.6-1 30-1981 2-4.2 30-1981 2-2.5	5	Tests should be performed on the 4" breather vent (BV) to determine whether the long length of pipe will create backpressures that can cause the internal pressures in the F.O. storage tank to exceed 2.5 psi when 78,900 CFH needs to be vented.	The subject tank is not safety-related, is not required for safe shutdown, and a fire in the area will not affect safe shutdown of either unit. An automatic suppression system is provided. Existing vents are provided.	The existing tank design will not change.
18.20-0 (125,000 gal. F.O. Storage Tank)(NS)	30-1981 2-4.2	6	Supplement the existing 6" breather vent (BV) and the 4" overflow line with an 8.8" diameter emergency breather vent (EBV).	The subject tank is not safety-related, is not required for safe shutdown, and a fire in the area will not affect safe shutdown of either unit. Existing vents are provided.	The existing tank design will not change.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE*	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 30, 1981 Edition - Flammable Liquids Code (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 37, 1979 Edition - Stationary Combustion Engines					
9.3-1 9.4-1 EMD's Day Tanks(S)	37-1979 5-4.1 5-4.2	1	The tank should be equipped with (1) a high level alarm, and (2) a high level shutoff.		The fuel oil circulates to storage tanks to maintain full capacity. Fuel does not overflow into room.
9.3-1 9.4-1 EMD's Day Tanks(S)	37-1979 5-5.3 30-1981 2-4.4.3	2	The liquid transfer connections beneath the liquid level of the tank should be provided with either (a) A normally closed remotely activated valve, (b) an automatic closing heat activated valve, or (c) another approved device to provide for quick cut-off of flow in the event of fire in the vicinity of the tank.		Shutoff will not be permitted for this equipment since it is safety-related.
10.1-1 10.2-1 (25,000-gallon diesel F.O. storage tanks)(S)	37-1979 5-5.3 30-1981 2-4.4.3	3	The liquid transfer connections beneath the liquid level of the tank should be provided with either (a) a normally closed remotely activated valve or (b) an automatic losing heat activated valve or (c) another approved device to provide for quick cut-off of flow in the event of fire in the vicinity of the tank.		Shutoff will not be permitted for this equipment since it is safety-related.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 50A, 1984 Edition - Gaseous Hydrogen Systems					
18.18-0 and all interior zones in which the piping crosses (NS areas)	50A-1984 2-6.1	4	All piping, tubing, and fittings shall be tested and proven gas-tight at maximum operating pressure.		M&MPC will review station documentation and resolve prior to 5% power.
	50A-1984 2-4.1	5	All valves, gauges, and other accessories shall be proven suitable for hydrogen services.		M&MPC will review vendor documentation and resolve prior to 5% power.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 72D, 1979 Edition - Proprietary Protective Signaling Systems					
	72D-75-1232(b)/ 1234 72D-79-2-4.3	1	Test gate valve supervising switches semiannually and perform drain test.		Switches will be periodically tested annually. Drain tests will be conducted. The annual testing period is considered adequate. The procedure has been written and approved.
	72D-75-1254 72D-79-4-7.3	3	Upon receipt of trouble signals, the control room operator shall notify the authority having jurisdiction where interruption of normal service will exist for more than four hours and provide written notice to the authority having jurisdiction when equipment has been out of service for eight hours.		The authority having jurisdiction is not notified when detection equipment is out of service for an extended period. Rather, the limiting conditions for operation are specified in the Technical Requirements Manual, Section 3.10.a. Additional fire protection measures are specified for such cases. This is considered to be adequate.
	72D-75-2022 72D-79-2-2.2	4	All devices, combinations of devices and equipment constructed shall be approved/listed for the purposes intended. (This pertains to the Alison Control Panels).	Documentation could not be found substantiating the listing or approval of the Alison Panels. Note: P.O. 42000356 and Specification F2854 specified U.L. listed or FM approval.	All panels are equivalent to F.M. approved. M&M to document justification prior to 5% power.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 72D, 1979 Edition - Proprietary Protective Signaling Systems (Cont'd)					
	72D-79-3-5.12	6	Automatic fire detectors which have integral trouble contacts shall be wired on the initiating device circuit so that a trouble condition on one detector will not impair the alarm operation from other initiating devices.		Upon receipt of a trouble alarm, an operator is dispatched to the area and a fire watch may be initiated until trouble is cleared. This is considered to be acceptable.
	72D-79-3-6.2.2	7	Automatic sprinkler system signals shall indicate distinctively the particular function (valve position, grounds, opens, etc.).		Upon receipt of a trouble alarm, an operator is dispatched to the area and a fire watch may be initiated until trouble is cleared. This is considered to be acceptable.
	72D-75-2223 72D-79-2-6.2.3	8	When central station primary power is provided from a commercial light and power source and engine-driven generator, storage batteries having the capacity to operate the system under maximum load for four hours shall be provided.	Bus 132 (ESF Bus) is the primary power supply to the proprietary alarm systems. Bus 134 is the secondary power supply. An impairment in Bus 142 could impair all sources of power to Bus 132.	Bus 142 is a safety-related ESF power source. It is normally fed from the system auxiliary transformer, but is also has a diesel generator backup in case of a loss-of-offsite power. In addition, a manual crosstie to Unit 2 Bus 242 is provided. This supply is as reliable as was intended by the NFPA code, and is

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 72D, 1979 Edition - Proprietary Protective Signaling Systems (Cont'd)					
					considered to be acceptable as is.
	72D-75-2224 72D-79-2-6.24	9	A separate power supply, independent of the main power supply, shall be provided for the operation of trouble signals (may use the secondary power supply).	Trouble signals are fed from the primary source.	Due to the high reliability of the primary power supply, as mentioned above, this is considered to be acceptable.
	72D-75-2461	11	Provide distinctive trouble and alarm signals in the control room for Units No. 1 and No. 2.	Signals used for Unit 1 and No. 2 are distinctive from other plant signals but not from the Unit No. 1 and Unit No. 1 control panels.	The Unit 1 and Unit 2 fire alarm panels are located not adjacent to one another in the control room. It will be obvious to an operator responding to a fire alarm which unit is affected. The existing design is considered to be acceptable.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 72E, 1982 Edition - Fire Detectors					
All	72E-1982-8-3.3	---	Test smoke detectors semiannually.	Justification for this deviation is documented in PSD FP transmittal 92-113.	Smoke detectors are tested every 18 months.
All	72E-1982-8-3.2.2	---	Test a restorable heat detector on each circuit semiannually. After 5 years, all must be tested.	Justification for this deviation is documented in PSD FP transmittal 92-113.	All restorable heat detectors are tested every 18 months.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 80, 1981 Edition - Fire Doors (Cont'd)					
509-523 553-554 649-669 720					
143-152 155-170 173-326 509	80-1981 2-5.4	6	The clearance between the bottom of the door and a raised noncombustible sill shall not exceed 3/8 inch. Where there is no sill, the maximum clearance between the bottom of the door and floor shall not exceed 3/4 inch.	Reduce clearance.	Remaining thresholds will be installed when Phase II security is implemented. All work required for 5% power has been completed.
SD 169-170 SD 171-175 SD 180-181 234 319-348 351-373 381-383 398-400 411-415 420-427 477-489 538-551 552-648 649-701 729-730	80-1981 2-8.5 2-8.8	8	Holder/release devices shall be permitted when acceptable to the authority having jurisdiction. The devices shall be installed in accordance with the manufacturer's instructions and only in conformance with the individual manufacturer's published listings.		Security hardware is necessary for controlled areas. Refer to page 2.1-9 of the FPR.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 80, 1981 Edition - Fire Doors (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 80, 1981 Edition - Fire Doors (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation					
18.1-1 (ESF Div. elev. 426') 18.2-1 (ESF Div. 11 elev. 426') 18.1-1 (Lower cable sprd. rm. elev. 439') 11.7-1 (Cont. purge supply elev. 467') 11.7-0 (Cont. purge exhaust elev. 451') 18.2-1 (Non-ESF supply unit elev. 451') 18.4-1 (Control Rm. HVAC elev. 451')(S)	90A-1981-2-4.1.1	1	Air filters shall be approved such as Class 1 and Class 2 that will not burn or emit excessive smoke.	These filter enclosures contain Class 2 filters with combustible pegboard panels in the frame. Combustible pegboard should be removed.	Temporary condition. Pegboard was removed by fuel load on systems required to be operable at that time. Other systems will be completed when required to be operable.
11.3F-1 and 11.3G-1(S)	90A-1981-3-3.1	2	Duct openings through fire walls shall be protected by an automatic closing 3-hr-rated fire damper.	(f) Common 3-hr fire wall between safety inj. pump and charging pump/cooler is violated by common duct system outside the room that does not have fire dampers.	Neither area comprises a 3-hr fire-rated room. Safe shutdown does not require 3-hr rated separation. Not necessary to install damper in duct.
11.7-0 (Cont. purge exhaust duct elev. 475')(S)	90A-1981-4-3(b)	4	Duct smoke detectors shall be installed in the return air stream prior to exhausting from the building or being diluted by outside air.	(b) Couldn't locate detector if any. Containment purge system may be connected to Aux. Bldg. exhaust shaft.	S&L review with M&M resulted in cancellation of change. Existing design is acceptable.
5.6-1(S)	90A-1981-4-3(a)	5	Duct smoke detectors shall be installed in the main supply duct downstream of filters.	(b) 32" x 18" supply duct from Div. 12 Elec. Equipment Room (zone 5.4-1) to Div. 11 Elec. Equipment Room (zone 5.6-1)	Adequate area smoke detection has been provided. This is adequate in lieu of duct detector.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					
All Zones	90A-1981-2-1.4.2	7	Service openings shall be identified with letters to indicate location of fire protection devices.	Pertains to <u>all</u> dampers and detectors for entire plant.	Will identify location of fire protection equipment prior to performing damper and detector surveillances scheduled for the first refueling outage.
8.3-1 (Supply duct for heater drain pump area, elev. 401') (NS) 8.3-1 (Boiler Room exhaust (72,000 cfm elev. 418') (NS) 8.5-1 (Air return @ col. F1 (14,000 cfm) elev. 426')(NS) 5.2-1 (ESF Div. 11 supply) (S) 8.3-1 (Supply for cond. pump area, elev. 401')(NS) 18.3-1 (Steam pipe tunnel and safety valve vent, system Area 2 col. 27 elev. 416')(S) 11.6A-8 (Lab fume exhaust duct elev. 426')(S)	90A-1981-4-5.1 (9) & 72E-1982-9-1.1.4	9	Detectors shall be installed in accordance with NFPA 72E.	The pyrotronics model CA-4 is listed for air velocities of 500-3100 FPM. In reference to the S&L HVAC drawings and actual detector location, the following areas exceed 3100 FPM; should verify actual airflows.	New detectors have been furnished for the VT system. Additional detectors for the VA system will be provided by 5% power.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					
8.6-0 (Control Room office supply fans A&B elev. 468')		10	Detectors shall be installed in accordance with NFPA 72E.	(e) Detectors adjacent to fans. Sampling tubes should be a minimum of two duct widths from sources of turbulence.	Will relocate sample tubes per manufacturer's instructions by 5% power. S&L to use a design change.
Generic to all duct smoke detectors(S)	90A-1981-4-3 (a)&(b)	11	Detectors in the main supply and return air ducts shall automatically stop the fan(s).		M&MPC will review and approve fan interlock design by 5% power.
Generic to all HVAC systems(S)	90A-1981-4-4	12	Smoke dampers shall be installed in systems over 15,000 cfm.	Describe where and what HVAC systems are utilized for smoke control.	M&MPC will review smoke removal plans to verify smoke detectors are not necessary prior to 5% power.
Generic to all detectors	90A-1981-4-5.1	13	Detectors shall be installed in accordance with NFPA 72E. Initial and periodic tests shall be conducted.	Provide documentation for testing sensitivity, interlocks, alarms, smoke test, in accordance mfg's instructions.	Functional system testing procedures are adequate. Agreement reached with NRC.

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

TABLE 3-1 (Cont'd)

FIRE ZONES	NFPA REFERENCE	RECOMMENDATION NUMBER	RECOMMENDATION	COMMENTS	RESOLUTION
NFPA 90A, 1981 Edition - Air Conditioning and Ventilation (Cont'd)					

THIS PAGE IS INTENTIONALLY LEFT BLANK

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(3) Responsibility for the overall fire protection program should be assigned to a person who has management control over all organizations involved in fire protection activities. Formulation and assurance of program implementation may be delegated to a staff composed of personnel prepared by training and experience in fire protection and personnel prepared by training and experience in nuclear plant safety to provide a balanced approach in directing the fire protection program for the nuclear power plant.	Administrative procedures identify the individual delegated the authority for establishing the fire protection program. The Fire Marshall developed the Fire Protection Administrative Procedure. He has nuclear plant safety expertise available as part of the operating department.
The staff should be responsible for:	
(a) Fire protection program requirements, including consideration of potential hazards associated with postulated fires, with knowledge of building layout and systems design.	Using the prefire plans for safety-related areas, hazards are defined, structures and system identified. The Fire Marshall (as administrator) maintains the plans.
(b) Post-fire shutdown capability.	The Shift Manager is responsible for operating safely and can order shutdown if he deems it necessary for safety per Administrative Procedures.
(c) Design, maintenance, surveillance, and quality assurance of all fire protection features (e.g., detection systems, suppression systems, barriers, dampers, doors, penetration seals, and fire brigade equipment).	Maintenance and surveillance are handled by the station Operating, Maintenance and Engineering programs and procedures. Offsite QA (Nuclear Oversight) is a separate organization. Onsite QA (Nuclear Oversight) organization provides review of maintenance, and purchase activities in accordance with the corporate QA Manual.
(d) Fire prevention activities (administrative controls and training).	The Fire Marshall and Training Department direct training per Administrative Procedures.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(e) Fire brigade organization and training.	The Fire Marshall administers the station fire protection program (see 3.1.a(2)).
(f) Prefire planning.	Prefire plans are written for safety-related areas and are controlled by the Fire Marshall. Preplans were reviewed by a Fire Protection Engineer.

Comply.

1. Responsibility for the Fire Protection Program

a. Initial Design and Construction Phase

The fire protection system design for the EGC plants was developed by the project consulting engineer using members of his staff who were experienced in nuclear plant design.

Exelon Generation Company is a member of Nuclear Electric Insurance Limited (NEIL) and therefore guidelines for fire protection design were provided in the NEIL Property Loss Prevention Standards for Nuclear Generating Stations.

The building design was done by the consulting engineer. All design drawings which were pertinent to fire protection were submitted to a fire protection consultant as required by NEIL for their review and comment. The fire protection consultant was employed by NEIL and was therefore independent of EGC. The comments on design information made by the fire protection consultant were submitted to EGC for their action.

Exelon Generation Company reviewed the project consultants' design drawings

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	and the fire protection consultants' comments. Judgments were made on a cost-benefit basis as to whether or not the fire protection features were to be incorporated into the plant.
	Consideration was given to the following plant features when evaluation of fire protection was made: a. plant and personnel safety, b. credibility of a fire or fire hazard, c. loss of generation because of fire loss, and d. protection of surrounding or adjacent equipment resulting from a fire.
	A Project Engineer who reported to the Project Engineering Manager coordinated fire protection design features at Braidwood.
	Likewise, a review of design and design changes was performed by a Fire Protection Engineer in the Station Support Services Department and by Independent Fire Protection Engineers working under contract to EGC. Resumes for the reviewers are in Appendix A5.1.
	Surveillance tests were performed by the Project Construction Department and by the Station. The Fire Protection Engineers were involved in pre-operational and surveillance tests.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	b. Operating Phase Exelon Generation Company has a Fire Marshall and Fire Protection System Engineer at each nuclear plant. In addition, there are Fire Protection Engineers in the Corporate and/or Site design engineering departments. 1. Properties and Equipment - The Fire Protection Engineers furnish information on underwriting standards, fire insurance rating standards and other information. When necessary they arrange for procuring advice from

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE

outside fire prevention agencies or other outside sources. When necessary, arrange and set up meetings to discuss and resolve any questions on current standards or fire protection equipment.

2. Fire Inspections - Site personnel, QA (Nuclear Oversight), and NEIL perform fire protection inspections of plant facilities.

3. Fire Fighting Equipment - The Station Fire Marshall sees that adequate fire fighting equipment is provided and that such equipment is maintained in good operating condition.

4. Tests - The Project Startup Group performs preoperational testing of new fire fighting equipment and automatic fire protection systems to ensure that each is in good condition and operating satisfactorily. During normal or routine inspections, one or more of the following tests may be made:

a. alarm tests,
b. drain tests,
c. churning of fire pumps,
d. inspecting of control valves,
e. physical testing of fire pumps and yard hydrants.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	f. checking or testing water deluge systems, g. checking of automatic sprinkler systems, and h. testing of standpipes and hoses. 5. Contacts - The Station Fire Marshall maintains company contacts with local fire departments. The Station Fire Marshall and the Fire Protection Engineers maintain contact with fire prevention organizations, insurance companies, and others on matters relating to fire fighting. 6. Reporting Fires - Fire reports are issued by the station. The Fire Marshall reports fires as necessary to the insurance company. 7. Training of Personnel - The Station Training Department, Corporate Training Department, and Fire Marshall are responsible for personnel training. This is done to ensure that individuals trained become familiar with the operation and use of fire fighting equipment. 8. Rules and Standards - The Fire Protection Engineers assist and advise departments concerned with established rules and standards relative to fire prevention and protection as may be necessary. 9. Recommendations - On all recommendations initiated by insurance agencies, fire prevention organizations, and other outside activities or company departments, the Fire Protection Engineers investigate, evaluate, discuss, and review such recommendations, where necessary, before making final recommendations as to specific action to be taken.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	10.Design Change - All design changes are reviewed for impact upon the Fire Protection Program per Administrative Procedures.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	It is our opinion that the intent of the Branch Technical Position is met by the above outlined organizational structure in design, construction and operation of the EGC nuclear plants.
(4) The organizational responsibilities and lines of communication pertaining to fire protection should be defined between the various positions through the use of organizational charts and functional descriptions of each position's responsibilities. The following positions/organizations should be designated:	Administrative procedures define the organizational responsibilities and lines of communication for the Fire Protection Program.
(a) The upper level offsite management position which has management responsibility for the formulation, implementation, and assessment of the effectiveness of the nuclear plant fire protection program.	Administrative procedures identify the offsite-delegated individual responsible for the nuclear plant fire protection program. Assessment of the program is made by: a) EGC Fire Protection Engineers b) EGC QA (Nuclear Oversight)
(b) The offsite management position(s) directly responsible for formulating, implementing, and periodically assessing the effectiveness of the fire protection program for the licensee's nuclear power plant including fire drills and training conducted by the fire brigade and plant personnel. The results of these assessments should be reported to the upper level management position responsible for fire protection with recommendations for improvements or corrective actions as deemed necessary.	The Site Nuclear Oversight Manager and EGC Fire Protection Engineers have these responsibilities.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(c) The onsite management position responsible for the overall administration of the plant operations and emergency plans which include the fire protection and prevention program and which provide a single point of control and contact for all contingencies.	Administrative Procedures identify the onsite-delegated individual responsible for the overall administration of the plant operations and emergency plans.
(d) The onsite position(s) which:	
i. Implements periodic inspections to: minimize the amount of combustibles in safety-related areas; determine the effectiveness of housekeeping practices; assure the availability and acceptable condition of all fire protection systems/equipment, emergency breathing apparatus, emergency lighting, communication equipment, fire stops, penetration seals, and fire retardant coatings; and assures the prompt and effective corrective actions are taken to correct conditions adverse to fire protection and preclude their recurrence.	Administrative Procedures require the Fire Marshall to conduct periodic plant tours, identify unacceptable conditions and initiate corrective actions. Administrative Procedures state the Fire Marshall is responsible for implementation and administration of the fire protection program. Administrative Procedures state the Radiation Protection department will control and maintain emergency breathing apparatus. Administrative Procedures state Electrical Maintenance will maintain emergency lighting and communications. Fire barriers, seals, and doors are inspected per the appropriate operating, maintenance, and engineering surveillance. Administrative Procedures state the Fire Marshall will investigate fires, evaluate prevention recommendations and make recommendations when needed.
ii. Is responsible for the fire fighting training for operating plant personnel and the plant's fire brigade; design and selection of equipment; periodic	Fire brigade training is a responsibility of both the Fire Marshall and the training department per Administrative Procedures. Operating personnel are trained periodically through the Training Department on fire fighting.

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	Inspection and testing of fire protection systems and equipment in accordance with established procedures, and evaluate test results and determine the accept-ability of the systems under test.	The Operating Manager ensures all operating surveillances are done in accordance to required guides. The Maintenance, Engineering, and Operating Managers are responsible for station procedures performed by their department. The Fire Marshall will review the surveillances he deems necessary. Evaluation of tests and surveillances are specified in test, surveillance and administrative procedures. The Fire Marshall is responsible for the purchase of fire brigade equipment.
iii.	Assists in the critique of all fire drills to determine how well the training objectives have been met.	Critique of all fire drills is a responsibility of the Fire Marshall per Administrative Procedures.
iv.	Reviews and evaluates proposed work activities to identify potential transient fire loads.	The Fire Marshall will have these responsibilities.
v.	Implements a program for indoctrination of all plant contractor personnel in appropriate administrative	Contractor's training through NGET fulfills this requirement. They are informed of emergency procedures relative to fire protection.

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	procedures which implement the fire protection program, and the emergency procedures relative to fire protection.	
vi.	Implements a program for instruction of personnel on the proper handling of accidental events such as leaks or spills of flammable materials that are related to fire protection.	The procedure for instruction of personnel on the proper handling of oil spills is identified in Administrative Procedure for the "Control and Cleanup of Oil Spills." The procedure references corporate general instruction on spill prevention and countermeasures.
(e)	The onsite position responsible for fire protection quality assurance. This position should be responsible for assuring the effective implementation or the fire protection program by planned inspections, scheduled audits, and verification that the results of these inspections or audits are promptly reported to cognizant management personnel.	The Fire Protection Program Administrative Procedure identifies that Fire Protection Activities are treated as augmented quality per the QA program. Site/Offsite QA (Nuclear Oversight) Department personnel conduct audits and surveillances to ensure proper implementation and administration of the Fire Protection Program.
(f)	The positions which are part of the plant fire brigade:	
i.	The plant fire brigade positions should be responsible for fighting fires. The authority and responsibility of each fire brigade position relative to fire	The Fire Protection Program Administrative Procedure defines the Fire Chief and Brigade responsibilities and meets the requirements for authority and duties.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
operating a plant fire brigade.	
(5) Personnel Qualifications	Comply.
(a) The position responsible for formulation and implementation of the fire protection program should have within his organization or as a consultant a fire protection engineer who is a graduate of an engineering curriculum of accepted standing and shall have completed not less than 6 years of engineering attainment indicative of growth in engineering competency and achievement, 3 years of which shall have been in responsible charge of fire protection engineering work. These requirements are the eligibility requirements as a Member in the Society of Fire Protection Engineers.	The position responsible for the fire protection program has the use of a Fire Protection Consultant. These Consultants meet SFPE member grade requirements. Exelon Generation Company also employs Fire Protection Engineers who meet the qualification for member grade in SFPE. (The EGC Fire Protection Engineer's duties are identified in the Fire Protection Program administrative procedure.)
(b) The fire brigade members' qualifications should include satisfactory completion of a physical examination for performing strenuous activity, and of the fire brigade training described in Position C.3.d.	The fire brigade members have an annual physical which shows them capable of unrestricted activity.
(c) The personnel responsible for the maintenance and testing of the fire protection systems should be qualified by training and experience for such work.	The personnel responsible for maintenance and testing of the fire protection systems receive training scheduled by the training department.
(d) The personnel responsible for the training of the fire brigade should be qualified by training and experience for such work.	The training of the fire brigade is conducted by a qualified member of the EGC Training Department. State-certified members of the EGC Fire Marshall's staff monitor this training.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
combustible materials should be removed from the area immediately following unpacking. Such transient combustible material, unless stored in approved containers, should not be left unattended during lunch breaks, shift changes, or other similar periods. Loose combustible packing materials such as wood or paper excelsior, or polyethylene sheeting should be placed in metal containers with tight-fitting self-closing metal covers.	
j. Disarming of fire detection or fire suppression systems should be controlled by a permit system. Fire watches should be established in areas where systems are so disarmed.	Comply. Disarming of fire detection or fire suppression systems is controlled by administrative procedure. Compensatory measures are established as required by the governing procedure.
k. Successful fire protection requires testing and maintenance of the fire protection equipment and the emergency lighting and communication. A test plan that lists the individuals and their responsibilities in connection with routine tests and inspections of the fire detection and protection systems should be developed. The test plan should contain the types, frequency, and detailed procedures for testing. Procedures should also contain instructions on maintaining fire protection during those periods when the fire protection system is impaired or during periods of plant maintenance, e.g., fire	Comply. The scope of the job classification for maintenance personnel identifies job responsibilities in the area of fire protection. An administrative procedure for "Fire Protection Impairment," provides instructions in the use of fire protection impairment permit cards in the event a fire protection component is taken out of service. The surveillance program (Test Plan) contains the types, frequency, and detailed procedures for testing.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
in the area selected, allowing for fire development due to the time required to respond, to obtain equipment, and organize for the fire, assuming loss of automatic suppression capability.	
iv. Assessment of brigade leader's direction of the fire fighting effort as to thoroughness, accuracy, and effectiveness.	
(8) Records Individual records of training provided to each fire brigade member, including drill critiques, should be maintained for at least 3 years to ensure that each member receives training in all parts of the training program. These records of training should be available for NRC review. Retraining or broadened training for fire fighting within buildings should be scheduled for all those brigade members whose performance records show deficiencies.	Comply. Refer to Section III.I.4 of Appendix A5.7.
(9) Guidance Documents NFPA 27, "Private Fire Brigade," should be followed in organization, training, and fire drills. This standard also is applicable for	Comply. Fire training by responsible instructors is done periodically. See Table 3-1 for delineation of conformance with NFPA 27 and NFPA 197.

3.4 QUALITY ASSURANCE PROGRAM

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
The quality assurance (QA) programs of applicants and contractors should ensure that the guidelines for design, procurement, installation, and testing and the administrative controls for the fire protection systems for safety-related areas are satisfied. The QA program should be under the management control of the QA organization. This control consists of (1) formulating a fire protection QA program that incorporates suitable requirements and is acceptable to the management responsible for fire protection or verifying that the program incorporates suitable requirements and is acceptable to the management responsible for fire protection, and (2) verifying the effectiveness of the QA program for fire protection through review, surveillance, and audits. Performance of other QA program functions for meeting the fire protection program requirements may be performed by personnel outside of the QA organization. The QA program for fire protection should be part of the overall plant QA program. It should satisfy the specific criteria listed below.	The fire protection systems at Byron/Braidwood Stations Units 1 and 2 are addressed in two different manners under the Quality Assurance Program. 1. Fire protection systems classed as safety-related are covered by the entire Quality Assurance Program which includes the criteria set forth in Appendix B of 10 CFR 50. 2. Fire protection systems that are classed as non-safety-related and that are awarded after September 1, 1978 are procured and installed in accordance with the Branch Technical Position 9.5-1. Vendors awarded with supplying or installing a fire protection system after September 1, 1978 must have an approved QA Program as required by the Quality Assurance Program and be on the Approved Bidder's List. However, exceptions may be made for selected non-safety-related systems to allow installation without an approved QA program. Each installation of this type requires a separate analysis that includes, as a minimum, a regulatory change evaluation; a definable augmented quality class break point, such as an isolation valve; and a hydraulic evaluation for added sprinklers or fire hose stations, as applicable. The applicable fire and building codes (such as NFPA codes) will be followed and a fire protection engineer will review the change.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	Scheduled fire protection inspections are conducted under the direction of QA (Nuclear Oversight) with direct participation by a qualified fire protection engineer consultant. New designs or revisions to plant fire protection systems are reviewed as outlined in the response to Section 3.1. The Quality Assurance Program applies to procurement, design, installation, modifications and maintenance activities involving fire protection systems. As such, each specific criteria listed as "a" through "j" of Section NRC Position are covered by the Quality Assurance Program and by Department and Station Procedures. Further implementation

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
relating to specific criteria, where deemed appropriate, follow:	
a. Design and Procurement Document Control Measures should be established to ensure that the guidelines of the regulatory position of this guide are included in design and procurement documents and that deviations therefrom are controlled.	
b. Instructions, Procedures, and Drawings Inspections, tests, administrative controls, fire drills, and training that govern the fire protection program should be prescribed by documented instructions, procedures, or drawings and should be accomplished in accordance with these documents.	b. Department and station procedures are established to cover specific instructions such as for inspections, tests, administrative controls, fire drills and training that govern the fire protection program.
c. Control of Purchased Material, Equipment, and Services Measures should be established to ensure that purchased material, equipment, and services conform to the procurement documents.	c. Carbon dioxide (CO_2) is controlled as a non-safety-related item per Material Engineering Group Evaluation M-94-0585-00.
d. Inspection A program for independent inspection of activities affecting fire protection should be established and executed by or for the organization performing the activity to verify conformance with documented installation drawings and test procedures for accomplishing the activities.	d. Independent inspections are performed by Quality Assurance (Nuclear Oversight), utilizing fire protection consultants as required.
e. Test and Test Control A test program should be established and implemented to ensure	e. Tests of fire protection equipment and systems are included in regularly scheduled station operating surveillance

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
that testing is performed and verified by inspection and audit to demonstrate conformance with design and system readiness requirements. The tests should be performed in accordance with written test procedures; test results should be properly evaluated and acted on.	procedures. These procedures and test results are reviewed and evaluated by appropriate station personnel. QA (Nuclear Oversight) also audits this area.
f. Inspection, Test, and Operating Status Measures should be established to provide for the identification of items that have satisfactorily passed required tests and inspections.	
g. Nonconforming Items Measures should be established to control items that do not conform to specified requirements to prevent inadvertent use or installation.	
h. Corrective Action Measures should be established to ensure that conditions adverse to fire protection, such as failures, malfunctions, deficiencies, deviations, defective components, uncontrolled combustible material and nonconformances, are promptly identified, reported, and corrected.	h. Tests of fire protection equipment and systems are included in regularly scheduled operating surveillance procedures. Nonconforming equipment is identified as a result of their test and corrective action taken to rectify any deficiencies as provided by the QA Program.
i. Records Records should be prepared and maintained to furnish evidence that the criteria enumerated above are being met for activities affecting the fire protection program.	i. Documentation involving the fire protection program is retained in a central file or QA vault as provided by the QA Program.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
that automatic hold-open, release, and closing mechanisms and latches are operable. (See NFPA 80, "Fire Doors and Windows.")	
One of the following measures should be provided to ensure they will protect the opening as required in case of fire: (a) Fire doors should be kept closed and electrically supervised at a continuously manned location; (b) Fire doors should be locked closed and inspected weekly to verify that the doors are in the closed position; (c) Fire doors should be provided with automatic hold-open and release mechanisms and inspected daily to verify that doorways are free of obstructions; or (d) Fire doors should be kept closed and inspected daily to verify that they are in the closed position.	All fire doors have automatic closers. Options a, b, and d are used on various doors in the plant. Cable spreading room interior doors alarm in the control room. The other supervised doors are monitored by security. Required fire doors are inspected per the appropriate operating surveillance.
The fire brigade leader should have ready access to keys for any locked fire doors.	The brigade chief can obtain a key to access all areas.
Areas protected by automatic total flooding gas suppression systems should have electrically supervised self-closing fire doors or should satisfy option (a) above.	The diesel generator day tank rooms and the auxiliary feedwater diesel-driven pump and day tank rooms are not electrically supervised, although they are protected by automatic total flooding gas suppression systems. The fire doors to these rooms are surveilled to ensure they are in their proper position.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(6) Personnel access routes and escape routes should be provided for each fire area. Stairwells outside primary containment serving as escape routes, access routes for fire fighting, or access routes to areas containing equipment necessary for safe shutdown should be enclosed in masonry or concrete towers with a minimum fire rating of 2 hours and self-closing Class B fire doors.	The stairwells at Braidwood which serve as escape routes for station personnel and access routes for fire fighting personnel, as per the requirements of building codes, are enclosed by 2-hour fire-rated masonry walls with self-closing fire doors, and are clearly marked.
(7) Fire exit routes should be clearly marked.	Comply, see item 6 above.
(8) Each cable spreading room should contain only one redundant safety division. Cable spreading rooms should not be shared between reactors. Cable spreading rooms should be separated from each other and from other areas of the plant by barriers having a minimum fire resistance of 3 hours.	The Braidwood design complies, except for instances where cables from both safety divisions are routed in the same cable spreading room. Fire Protection Report Section 2.4.2 describes the measures taken in these areas to assure safe shutdown.
(9) Interior wall and structural components, thermal insulation materials, radiation shielding materials, and soundproofing should be noncombustible. Interior finishes should be noncombustible. Materials that are acceptable for use as interior finish without evidence of test and listing by a nationally recognized laboratory are the following: Plaster, acoustic plaster, gypsum plasterboard (gypsum wallboard), either plain, wallpapered, or painted with oil- or water-base paint; Ceramic tile, ceramic panels;	Minor amounts of combustibles are used as architectural finish materials. These existing materials do not significantly contribute to the fire loading in the plant, and do not expose safety-related systems to undue risks.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
(c) Enclosure of cable and equipment and associated circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system should be installed in the fire area.	
(3) If the guidelines of Positions C5.b.1 and C5.b.2 cannot be met, then alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems or components in the area, room, or zone under consideration should be provided.	
c. Alternative or Dedicated Shutdown Capability	
(1) Alternative or dedicated shutdown capability provided for a specific fire area should be able to achieve and maintain subcritical reactivity conditions in the reactor, maintain reactor coolant inventory, achieve and maintain hot standby* conditions for a PWR (hot shutdown* for a BWR) and achieve cold shutdown* conditions within 72 hours and maintain cold shutdown conditions thereafter. During the postfire shutdown, the reactor coolant system process variables shall be maintained within those predicted for a loss of normal ac power, and the fission product boundary integrity shall not be affected; i.e., there shall be no fuel clad damage, rupture, or any	Comply.

*As defined in the Technical Requirements Manual.

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	may be one unique combination of systems for all such areas. In either case, the alternative shutdown capability shall be independent of the specific fire area(s) and shall accommodate postfire conditions where offsite power is available and where offsite power is not available for 72 hours. Procedures shall be in effect to implement this capability.	
(4)	If the capability to achieve and maintain cold shutdown will not be available because of fire damage, the equipment and systems comprising the means to achieve and maintain the hot standby or hot shutdown condition shall be capable of maintaining such conditions until cold shutdown can be achieved. If such equipment and systems will not be capable of being powered by both onsite and offsite electric power systems because of fire damage, an independent onsite power system shall be provided. The number of operating shift personnel, exclusive of fire brigade members, required to operate such equipment and systems shall be onsite at all times.	Comply.
(5)	Equipment and systems comprising the means to achieve and maintain cold shutdown conditions should not be damaged by fire; or the fire damage to such equipment and systems should be limited so that the systems can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs shall be readily available onsite and	Comply. A repair procedure has been prepared to cover any repairs required. All materials and equipment needed to make these repairs will be maintained onsite.

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	procedures shall be in effect to implement such repairs. If such equipment and systems used prior to 72 hours after the fire will not be capable of being powered by both onsite and offsite electric power systems because of fire damage, an independent onsite power system should be provided. Equipment and systems used after 72 hours may be powered by offsite power only.	
(6)	Shutdown systems installed to ensure postfire shutdown capability need not be designed to meet seismic Category I criteria, single failure criteria, or other design basis accident criteria, except where required for other reasons, e.g., because of interface with or impact on existing safety systems, or because of adverse valve actions due to fire damage.	Comply.
(7)	The safe shutdown equipment and systems for each fire area should be known to be isolated from associated circuits in the fire area so that hot shorts, open circuits, or shorts to ground in the associated circuits will not prevent operation of the safe shutdown equipment. The separation and barriers between trays and conduits containing associated circuits of one safe shutdown division and trays and conduits containing associated circuits or safe shutdown cables from the redundant division, or the isolation of these associated circuits from the safe shutdown equipment, should be such that a	Comply. There are no associated circuits as defined in IEEE 384-1974 at B/B. Associated circuits as defined in the NRC's April 6, 1982 clarification letter to Generic Letter 81-12 are addressed in Subsection 2.4.1.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
postulated fire involving associated circuits will not prevent safe shutdown.	
d. Control of Combustibles	
(1) Safety-related systems should be isolated or separated from combustible materials. When this is not possible because of the nature of the safety system or the combustible material, special protection should be provided to prevent a fire from defeating the safety system function. Such protection may involve a combination of automatic fire suppression, and construction capable of withstanding and containing a fire that consumes all combustibles present. Examples of such combustible materials that may not be separable from the remainder of its system are:	Comply.
(a) Emergency diesel generator fuel oil day tanks.	The emergency diesel generator fuel oil day tanks are provided with automatic fire suppression.
(b) Turbine-generator oil and hydraulic control fluid systems.	The turbine-generator oil and hydraulic control fluid system are contained in the Turbine Building and thus separated from all safety-related areas.
(c) Reactor coolant pump lube oil system.	Fire Protection of the reactor coolant pump lube oil system is described in A5.7 Section III.0 and 3.7.a(1)(e).
(2) Bulk gas storage (either compressed or cryogenic), should not be permitted inside structures housing safety-related equipment. Storage of flammable gas such as hydrogen should be located outdoors or in separate	See Table 3-1 for delineation of conformance with NFPA 50A.

SECTION	NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	detached buildings so that a fire or explosion will not adversely affect any safety-related systems or equipment. (Refer to NFPA 50A, "Gaseous Hydrogen Systems.") Care should be taken to locate high-pressure gas storage containers with the long axis parallel to building walls. This will minimize the possibility of wall penetration in the event of a container failure. Use of compressed gases (especially flammable and fuel gases) inside buildings should be controlled. (Refer to NFPA 6, "Industrial Fire Loss Prevention.")	
(3)	The use of plastic materials should be minimized. In particular, halogenated plastics such as polyvinyl chloride (PVC) and neoprene should be used only when substitute noncombustible materials are not available. All plastic materials, including flame and fire retardant materials, will burn with an intensity and BTU production in a range similar to that of ordinary hydrocarbons. When burning, they produce heavy smoke that obscures visibility and can plug air filters, especially charcoal and HEPA. The halogenated plastics also release free chlorine and hydrogen chloride when burning which are toxic to humans and corrosive to equipment.	Comply. The use of plastic material is minimized. The use of PVC and neoprene has been severely restricted.
(4)	Storage of flammable liquids should, as a minimum, comply with the requirements of NFPA	See Table 3-1 for delineation of conformance with NFPA 30.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
plenums for ventilation of the control room. Fully enclosed electrical raceways located in such underfloor and ceiling spaces, if over 1 square foot in cross-sectional area, should have automatic fire suppression inside. Area automatic fire suppression should be provided for underfloor and ceiling spaces if used for cable runs unless all cable is run in 4-inch or smaller steel conduit or the cables are in fully enclosed raceways internally protected by automatic fire suppression.	There are no electrical cable trays located under floor and ceiling spaces. Currently, this is also true for the raised floor in the process computer room, which is part of the control room complex. There are some conduits above dropped ceiling. Upper cable spreading room has automatic halon and lower cable spreading room has automatic CO_2. Upper cable spreading room has manual CO_2 as a backup.
There should be no carpeting in the control room.	Carpeting in the main control room has a flame spread of 25 or less.
c. Cable Spreading Room	
The primary fire suppression in the cable spreading room should be an automatic water system such as closed-head sprinklers, open-head deluge system, or open directional water spray system. Deluge and open spray systems should have provisions for manual operation at a remote station; however, there should be provisions to preclude inadvertent operation. Location of sprinkler heads or spray nozzles should consider cable tray arrangements and possible transient combustibles to ensure adequate water coverage for areas that could present exposure hazards to the cable system. Cables should be designed to allow wetting down with water supplied by the fire suppression system without electrical faulting.	Comply, except as explained below: The Byron/Braidwood design includes several cable spreading rooms at elevation 439'-0" and 463'-4-1/2". The rooms are designed such that redundant safe shutdown cabling is routed through separate rooms (except as noted in Section 2.4.2) and isolated by 3-hour fire barriers. The upper cable spreading rooms are protected by an automatic Halon 1301 system with a manual CO_2 backup system. Manual hose stations and portable extinguishers provide additional backup. The lower cable spreading areas are protected by an automatic CO_2 system. Backup is provided by manual hose stations and portable extinguishers. Conformance of the halon and CO_2 systems as installed at Braidwood to the requirements of the governing codes, NFPA 12 and NFPA 12A, will be evaluated.

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
Open-head deluge and open directional spray system should be zoned. The use of foam is acceptable. Cable spreading rooms should have: (1) At least two remote and separate entrances for access by fire brigade personnel; (2) An aisle separation between tray stacks at least 3 feet wide and 8 feet high; (3) Hose stations and portable extinguishers installed immediately outside the room; (4) Area smoke detection; and (5) Continuous line-type heat detectors for cable trays inside the cable spreading room. Drains to remove fire fighting water should be provided. When gas systems are installed, drains should have adequate seals or the gas extinguishing systems should be sized to compensate for losses through the drains. A separate cable spreading room should be provided for each redundant division. Cable spreading rooms should not be shared between reactors. Each cable spreading room should be separated from the others and from other areas of the plant by barriers with a minimum fire	Cable spreading rooms 3.3B-1 and 3.3B-2 have only one access door. The BTP position is that an automatic water suppression system should be installed in the cable spreading rooms. The Braidwood system provides adequate fire protection in the cable spreading rooms without an automatic water system. Hose stations are available for use in the cable spreading rooms if required. An automatic water suppression system was not installed in the cable rooms because of concerns about the probability and effects of inadvertent actuations. The thermal elements in the Fenwal rate compensated heat detectors are very similar to the thermal elements in the automatic water suppression systems. Since a cable fire would generate large quantities of smoke in a very early stage of a fire, the ionization detectors would be very effective in detecting small cable fires and annunciating in the control room. If the fire was of such magnitude that the thermal detectors sensed the fire, the automation actuation of the fire suppression system would then be initiated. The detector circuits are designed that if either of the redundant detection zones failed, the remaining detection zone could then solely initiate the automatic suppression system. For this application the cross-zoning of rate compensated heat detectors with ionization detectors would not reduce the responsiveness of a fire detection system compared to a closed-head sprinkler system. A deluge system which indiscriminately sprays a large area will result in a significant effort to restore the cable spreading room to normal conditions and could

SECTION NRC POSITION	IMPLEMENTATION OR JUSTIFICATION FOR NONCOMPLIANCE
	of a plant shutdown or equipment damage in the event of a spurious actuation. Additionally, the area is well supplied with manual hose stations and portable fire extinguishers.
d. Plant Computer Rooms	
Computer rooms for computers performing safety-related functions that are not part of the control room complex should be separated from other areas of the plant by barriers having a minimum fire resistance rating of 3 hours and should be protected by automatic detection and fixed automatic suppression. Computers that are part of the control room complex but not in the control room should be separated and protected as described in Position C.7.b. Computer cabinets located in the control room should be protected as other control room equipment and cable runs therein. Non-safety-related computers outside the control room complex should be separated from safety-related areas by fire barriers with a minimum rating of 3 hours and should be protected as needed to prevent fire and smoke damage to safety-related equipment.	The process computer at Braidwood is non-safety-related and is part of the control room complex. Automatic fixed suppression is not provided. Fire protection features which are provided are described in Subsection 2.3.4 of this report.
e. Switchgear Rooms	
Switchgear rooms containing safety-related equipment should be separated from the remainder of the plant by barriers with a minimum fire rating of 3 hours. Redundant switchgear safety divisions should be separated from each other by barriers with a 3-hour fire rating. Automatic fire detectors should alarm and annunciate in the control room	Comply, except alarms do not annunciate locally.

TABLE 3-1

BRAIDWOOD UNIT 1
NFPA CODE DEVIATION REPORT

NFPA 10 - 1984, "Standard for Portable Fire Extinguishers"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
1	NFPA 10, para. 4-4.3, Each extinguisher shall have a tag or label securely attached that indicates the month and year the maintenance was performed and shall identify the person performing the service.	Permanently mounted fire extinguishers located in the Containment Building do not have tags or labels securely attached.	Completed surveillance procedure records that contain this information are maintained. This practice is considered equivalent. Paper tags are not provided in the Containment Building due to sump blockage concerns.
2	NFPA 10, para. 4.3.1, Fire extinguishers shall be inspected when initially placed in service and there after at approximately 30-day intervals.	Portable hand held extinguishers are inspected at approximately a 90-day frequency based on historical review of failure rate. Hand portable extinguishers inside containment during at power conditions are inspected during planned refuel outages.	Historical review indicates a failure rate of <1%. Administrative procedure allows extension of interval for inspection if failure rate is <1%. During at power conditions, access to containment is controlled administratively to prevent unauthorized Entry. The risk that fire extinguishers located in containment will be tampered with is very small. Inspections and maintenance or replacement of fire extinguishers in containment is performed during planned refuel outages.
3	NFPA 10, para. 4.4.1, Extinguishers shall be subjected to maintenance not more than a year apart.	Compliance will be met for all hand portable extinguishers except for those located inside containment during at power conditions. These extinguishers are subjected to maintenance during planned refuel outages.	During at power conditions, access to containment is controlled administratively to prevent unauthorized Entry. The risk that fire extinguishers located in containment will be tampered with is very small. Maintenance or replacement of fire extinguishers in containment is performed during planned refuel outages.

TABLE 3-1

BRAIDWOOD UNIT 1
NFPA CODE DEVIATION REPORT

NFPA 10 - 1984, "Standard for Portable Fire Extinguishers"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
4	NFPA 10, para. 4-3.1, Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require.	Wheeled portable extinguishers are inspected at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
5	NFPA 10, para. 4-3.1, Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require.	CO2 portable extinguishers are inspected at annual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
6	NFPA 10, para. 4-3.1, Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require.	AFFF Wheeled portable extinguishers are inspected at annual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.

Table 3-1 (Cont'd)

NFPA 13A - 1981, Inspection, Testing and Maintenance of Sprinkler Systems

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
1	NFPA 13A, para. 2-7.1.4, All control valves of the sprinkler system should be inspected at regular intervals Sealed valves -weekly Locked valves and valves with tamper switches - monthly	The sprinkler system alarm shutoff valves position verification is performed at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
2	NFPA 13A, para. 2-7.1.4, All control valves of the sprinkler system should be inspected at regular intervals Sealed valves -weekly Locked valves and valves with tamper switches - monthly	The automatic deluge system trim valves position verification is performed at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
3	NFPA 13A, para. 4-7.1, Test alarms quarterly by opening the inspector's test connections.	The automatic deluge (Turbine Bearing) system alarm test is performed at semiannual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
4	NFPA 13A, para. 4-5.3, Water flow alarm devices should be tested at least quarterly, weather permitting.	The automatic deluge (Turbine Bearing) system alarm test is performed at semiannual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
5	NFPA 13A, para. 2-6.1, Main drain valves water flow tests should be made quarterly from water supply test pipes.	The automatic deluge system main drain tests are performed at semiannual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.

Table 3-1 (Cont'd)

NFPA 14 - 1983, "Standard for the Installation of Standpipe and Hose Systems"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
6	NFPA 14, para. 5-2.3 At least one water supply shall be automatic and capable of supplying the streams first operated until secondary sources can be brought into action.	A water supply is not available at the River Screenhouse.	The hose stations at the River Screenhouse have been removed. The water supply from the Circulating Water Make-up Pumps is insufficient to support the proper operation of the hose stations. The local fire department provides water suppression capability. This is considered acceptable.
7	NFPA 14, para. 3-3.1 Standpipes shall be located in fire rated stair enclosures.	Standpipes are located throughout the plant.	In order to provide adequate distribution of hose stations throughout the facility, it is not possible to enclose the entire standpipe system. Sectionalizing valves are provided to isolate a minimum number of hose stations if necessary. This design is considered acceptable.
8	NFPA 14, para. 7-6.1.1, Pipe hangers shall be approved.	Pipe hangers in safety-related areas are not listed.	In containment, Auxiliary Building and Fuel Handling the piping supports are seismically designed by Sargent & Lundy in accordance with ANSI B31.1. Therefore, the hanger design is considered acceptable.

Table 3-1 (Cont'd)

NFPA 26 - 1983, "Supervision of Valves Controlling Water Supplies for Fire Protection"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
1	NFPA 26, para. 3-1, The locked open valves should be inspected monthly.	Locked open valves are inspected every 92 days.	Locked open valves are inspected every 92 days to verify the valve is in the correct position.
2	NFPA 26, para. 3-1, A systematic weekly inspection (or monthly in the case of locked - open valves) of each valve should be made.	The outdoor foam system valves position verification is performed at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
3	NFPA 26, para. 3-1, A systematic weekly inspection (or monthly in the case of locked - open valves) of each valve should be made.	The sprinkler system alarm shutoff valves position verification is performed at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
4	NFPA 26, para. 3-1, A systematic weekly inspection (or monthly in the case of locked - open valves) of each valve should be made.	The automatic deluge system trim valves position verification is performed at quarterly frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.

Table 3-1 (Cont'd)

NFPA 27 - 1981, "Recommendations for Organization, Training and Equipment of Private Fire Brigades"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
1	NFPA 27, para. 4-2.1, Training should be conducted and supervised, where possible, by a State Certified Fire Service Instructor.	Classroom training is conducted by training department instructors.	The classroom instructors are qualified for the subject areas presented. In addition, two state certified Fire Service Instructors are involved in all live fire training and some classroom instruction. The training program is considered acceptable.
2	NFPA 27, para. 4-3, Training sessions should be held at least monthly for one hour or more per shift.	Training sessions are conducted quarterly.	Training sessions conducted quarterly result in a total of 12 hours of training per year for each brigade member. This level of training is considered as satisfying NFPA.
3	NFPA 27, para. 4-1.4, The training program should keep up with the problems presented by new fire hazards.	PCB exposures are not included in training.	The module on special hazards will be modified to include fires involving PCBs prior to exceeding 5% power.

Table 3-1 (Cont'd)

NFPA 72D - 1979, "Standard for the Installation, Maintenance and Use of Proprietary Protective Signaling Systems"

ITEM	NFPA REFERENCE	DEVIATION	COMMENTS/RESOLUTION
1	NFPA 72D, para. 2-2.2.1(c). Equipment shall be so designed that it shall be capable of performing its intended function at a relative humidity of 85 ± 5% and an ambient temperature of 90 °± 4 °F for a duration of 24 hours.	Equipment is designed for a 70% relative humidity (fire protection panels).	The environment is controlled by the HVAC system that contains a humidity controller which maintains a setting of 40% RH ± 5% RH and heating controls which maintain a temperature setting of 75°F ± 2°F. This design is considered acceptable for the fire protection panel environment.
2	NFPA 72D, para. 2-2.3, Satisfactory acceptance tests shall be conducted. All functions of the systems shall be tested including operation of the system in various alarm and trouble modes for which it is designed (e.g., open circuit, grounded circuit, power outage, etc.).	Acceptance are tests not complete.	Testing to be complete and M&MPC is to review results prior to exceeding 5% power. HVAC alarms to be complete in conjunction with system completion.
3	NFPA 72D, para. 2-4.3(b), Every two months or more frequently, test shall be performed for all circuit interfaces and water flow acutuated devices.	The automatic deluge system alarm tests are performed at semiannual frequency based on historical review of failure rate.	Historical review indicates a failure rate of < 1%. Administrative procedure allows extension of frequency interval for inspection if the failure rate is < 1%.
4	NFPA 72D, para. 2-4.3(c). Gate valve supervisory switches shall be tested semiannually.	Gate valve supervisory switches are tested annually.	Supervised valves are also surveilled monthly. Therefore, annual alarm tests should be acceptable.