COMMONWEALTH EDISON COMPANY

BRAIDWOOD STATION

NFPA Code Deviations

for

Unit 1 and Common Areas

Prepared by:
M&M Protection Consultants
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NFPA 10 - 1984, "Standard for Portable Fire Extinguishers"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 10, Install portable fire extinguishers per NFPA.	Installation is not complete per drawings.	Extinguishers are to be installed by fuel load, except for portions of Auxiliary Building #2 by mode 4.

NFPA 11 - 1983, "Standard for Low Expansion Foam and Combined Agent Systems"

Item	NFPA Reference	Deviation	Comments/Resolution
1	NFPA 11, para. 2-6.3, 2-6.4, 2-6.4.1, Plans and hydraulic calculations shall show all pertenent data.	Drawings are not up to date.	Ongoing project to update "as-built" drawings. To be complete by commercial operation.
2	NFPA 11, para. 2-6.4.2, Only listed or approved devices shall be used.	The ASCO "Redhat" solenoid valves are not listed.	A listed solenoid valve is not available for this installation. Therefore, upon successful completion of pre-op testing, the valve is acceptable.
3	NFPA 11, para. 5-2, The completed system shall be acceptance tested.	Systems are not yet tested.	To complete tests by fuel load. M&MPC is to review results prior to exceeding 5% power.
4	NFPA 11, para. 5-3 & 5-3.5, At least annually, the system should be inspected and checked for proper operation including a sample analysis of the foam concentrate.	Need procedures for outdoor 50K gal. tank and overall revision.	To do by initial criticality.
5	NFPA 11, para. 5-4, Operating and maintenance instructions shall be posted at the control equipment with a second copy maintained on file.	Data will be maintained on file only.	All pertinent data is maintained on permanent file. Therefore, it is not necessary to post all information at the equipment.
6	NFPA 11, para. 2-6.4.3, Complete plans and detailed data describing controllers, etc. shall be prepared.	Control panel OFP06J is mislabeled "AFFF".	Label is to be corrected by fuel load.

NFPA 12 - 1985, "Standard on Carbon Dioxide Extinguishing Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 12, para. 1-6.1.1, Warning signs shall be placed outside all areas where carbon dioxide gas can accumulate.	All signs are not posted.	To be done by initial criticality.
2	NFPA 12, para. 1-7.3, The completed systems shall be inspected and tested.	Awaiting complete installation and testing.	To be installed and tested prior to exceeding 5% power. M&MPC is to review results.
3	NFPA 12, para. 1-8.3.9, All manual operating devices shall be identified as to the hazard they protect.	All signs are not posted.	To be done by initial criticality.
4	NFPA 12, para. 1-7.2.2, Plans shall contain sufficient detail.	Drawings are not up to date.	Ongoing project to update "as-built" drawings. To be complete by commercial operation.

NFPA 12 - 1985, "Standard on Carbon Dioxide Extinguishing Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
5	NFPA 12, para. 1-7.3, Only listed or approved equipment shall be used in the system.	The Chemetron control panels and damper control panels are not listed.	The panels are customed designed per S&L specifications and utilize U.L. listed components. In addition, the CO_2 panels are tested per Chemetron procedures which are based on U.L. testing procedures. Therefore, upon successful completion of pre-op testing, the panels are acceptable.
6*	NFPA 12, para. 1-8.3.8, The source of fuel shall be automatically shut off.	The fuel supply to the diesel generators and auxiliary diesel feedwater pump do not shut off automatically upon system actuation.	The continued operation of this equipment may be necessary for operating safety-related equipment. No action necessary.

NFPA 12A - 1985 "Standard on Halon 1301 Fire Extinguishing Systems"

Item	NFPA Reference	Deviation	Comments/Resolution
1	NFPA 12A, para. 1-7.4, The completed system shall be tested.	Installation is not completed for upper cable spreading rooms.	System installation is to be complete and concentration tested by mode 4. Pre-op tests and M&MPC review of test results prior to exceeding 5% power.
2	NFPA 12A, para. 1-8.3.1, Operating devices shall include Halon 1301 releasing devices or valves, discharge controls, etc.	A U.L. listed carbon dioxide pressure switch and pilot release valve are installed.	Per Chemetron, the devices are acceptable for use on halon systems. System operation will be demonstrated by test.
3	NFPA 12A, para 1-8.3.10, All manual operating devices shall be identified.	Labeling is not complete.	To do by initial criticality.
4	NFPA 12A, para. 1-8.5.5, Warning and instruction signs shall be provided.	Signs are not posted.	To do by initial criticality.
5	NFPA 12A, para. 1-9.4.2, Each container (cylinder) shall have a nameplate.	Nameplates are missing information.	To provide nameplate data by fuel load.
6	NFPA 12A, para. 1-9.4.4, A reliable means of indication, other than weighing, should be provided to determine the pressure in refillable containers.	Pressure gages are not installed on all cylinders.	Gages are to be installed by fuel load.

NFPA 12A - 1985, "Standard on Halon 1301 Fire Extinguishing Systems"

Item	NFPA Reference	Deviation	Comments/Resolution
7	NFPA 12A, para. 1-7.3.3, "As installed" plans shall be provided.	Drawings are not up-to-date.	Ongoing project to update "as-built" drawings. To be complete by commercial operation.
8	NFPA 12A, para. 1-7.2.4, Apparatus and devices shall be identified.	Control panel OFP05J is mislabeled "OFP01J". Panel OFP01J has no permanent label.	Labels are to be corrected by fuel load.

NFPA 13 - 1985, "Standard for the Installation of Sprinkler Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 13, para. 1-9.2, Working plans shall show all pertinent data.	Drawings are not up to date.	Ongoing project to update "as-built" drawings. To be completed by commerical operation.
2	NFPA 13, para. 1-11.1.1 Underground mains and lead-in connections shall be flushed before connection to the sprinkler piping.	Connections to sprinkler system were made prior to underground flush.	System flush has been completed. M&MPC is to review flush test results prior to exceeding 5% power.
3	NFPA 13, para. 2-9.2.2, The pressure gages shall have a maximum limit not less than twice the normal working pressure at the point where installed.	Installed gages have a limit of 300 psi.	Gages are adequate for expected working pressures of 180 psi and are considered acceptable.
4*	NFPA 13, para. 3-14.1.1 and 3-14.2, All valves shall be listed.	The Powell, Anchor-Darling, ITT Grinnell and Rockwell-Edwards valves are not listed.	The valves are designed to ANSI Standards and working pressure of 285 psi. Therefore, the valves are considered acceptable.
5*	NFPA 13, para. 3-15.1.2, Hanger assemblies shall be listed.	Hanger assemplies in safety-related areas are not listed.	In the Auxiliary Building, all sprinkler system supports are seismically designed by Sargent and Lundy to ANSI B31.1 and are acceptable.
6	NFPA 13, para. 3-17.6.3, Water flow devices including alarm circuits shall be tested.	Testing is not complete.	Testing to be completed by initial criticality. M&MPC will review test results prior to exceeding 5% power.

NFPA 13 - 1985, "Standard for the Installation of Sprinkler Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
7*	NFPA 13, para 2-7.1, A fire department connection shall be provided.	A fire department pumper connection is not provided.	The only source of water is the cooling lake, therefore, a pumper connection would be of no value without a municipal supply.
8*	NFPA 13, Chapter 4. Spacing, locations and position of sprinklers shall be made in accordance with NFPA.	During the walkdown of the systems, deviating locations and positions of sprinklers where identified.	Field changes will be made to eliminate obstructions where practical. Other partial obstructions are protected by adjacent sprinklers which will provide overlapping coverage for the area.
9	NFPA 13, para. 3-14.3, and NFPA 26, para. 2-1, Control valves shall identify the system controlled.	Sign installation is not complete.	Signs are to be provided by fuel load.
10	NFPA 13, para. 7-1.2, The installer shall identify a hydraulically designed system by an attached placard.	Signs or placards are not provided for hydraulically designed systems.	Placards are to be provided by commercial operation
11*	NFPA 13, para. 3-11.2.5, Each interior sectional valve shall be provided with a sectional drain valve.	Drains are not provided at each sectional valve.	Drainage provisions are made throughout the piping system at locations other than at each sectional valve. This arrangement is adequate to drain all portions of the system(s).

NFPA 13 - 1985, "Standard for the Installation of Sprinkler Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
12*	NFPA 13, para. 3-10.3.4, Clearance shall be provided around all piping extending through walls and floors.	Some portions of the piping pass through walls and floors without clearance.	Sargent & Lundy has designed anchor points on the fire protection piping, therefore, clearances are not provided as it would affect the structural design.
13	NFPA 13A, para. 4-4.1, Gages should be checked monthly on sprinkler systems and weekly on deluge systems.	Gages are checked quarterly and semi-anually.	With periodic alarm tests, inspector's test, drain test, valve position surveillance, system operability will be monitored. Quarterly gage checks are considered more than adequate.
14	NFPA 13A, para. 4-4.2, Gages should be checked with an inspector's gage every 5 years.	No procedure for 5 year check.	Gages will be observed quarterly on drain tests. Any unusual conditions will be resolved, including gage off scale. This will satisfy a separate gage check every 5 years and is considered acceptable.

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

Item	NFPA Reference	Deviation	Comments/Resolution
1	NFPA 14, Chapter 4, and para. 7-6.2 & 7-6.3, Hose stations and equipment shall be arranged and installed per NFPA.	Hose installations are not complete per design drawings.	Hose stations are to be completed by fuel load.
2	NFPA 14, para. 3-2.2, All portions of each story of a building shall be within 30 ft. of a nozzle when attached to not more than 100 ft. of hose.	All portions of the steam tunnel do not meet this requirement.	The present arrangement and proposed resolution is acceptable per NRR site audit of 8-18-86.
3*	NFPA 14, para. 4-2.1 & 4-4.2, Valves at the main riser, including hose valves, shall be approved.	Anchor-Darling, Anderson Greenwood, Powell and ITT Grinnell valves are not listed.	The valves are designed per ANSI Standards and a working pressure of 285 psi. Therefore, the valves are considered acceptable.
4*	NFPA 14, para. 4-7.1, Where pressure at any hose outlet exceeds 100 psi, an approved device shall be installed to reduce the pressure to 100 psi.	Pressure reducing devices are not installed for hose stations.	Fire brigade members have been trained for hose pressures in excess of 150 psi. This will satisfy the omission of pressure reducing devices.
5	NFPA 14, para. 4-7.2 & 1-6.5, Where system pressure at any hose valve outlet exceeds 150 psi, an appropriate warning sign shall be provided at each outlet.	Sign installation is not complete.	Signs are to be installed by fuel load.

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.	The supply at the River Screenhouse is not automatic.	Hose stations in the River Screenhouse are supplied by the circulating water make-up pumps which are normally operating or can be started from the control room. In addition, portable fire extinguishers and early warning fire detection are provided. 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 ANSIB31.1. Therefore, the hanger design is considered acceptable.

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

Item	NFPA Reference	Deviation	Comments/Resolution
9	NFPA 14-1983, para. 8-1.1, All systems shall be hydrostatically tested at 50 psi above the normal pressure for 2 hrs. The inside standpipe shall show no leakage.	Document hydrostatic test.	To do by fuel load.
10	NFPA 14-1983, para. 8-1.2.1, Piping shall be flushed.	Document flush was performed.	System flush is complete. M&MPC is to review results prior to exceeding 5% power.

NFPA 15 - 1985, "Standard for Water Spray Fixed Systems for Fire Protection"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 15, para. 4-7.2, Manual tripping devices shall be adequately identified as to the system controlled.	Signs are not posted for all deluge systems.	Signs are to be provided by initial criticality.
2	NFPA 15, para. 2-1.2, Only listed devices shall be employed.	The ASCo. "Redhat" solenoid valve is not listed. (turbine oil storage tank-1J, hydrogen seal oil unit-1D, turbine bearings-1W, and all transformer systems)	A listed solenoid valve is not available for these deluge valve applications. Therefore, upon successful completion of pre-op testing, the devices are acceptable.
3	NFPA 15, para. 5-1.1, Underground mains and lead-in connections shall be flushed before connection to system piping.	Connections were made prior to system flush.	System flush is complete. M&MPC is to review flush test results prior to exceeding 5% power.
4	NFPA 15, para. 5-2, All system piping shall be hydrostatically tested at 50 psi in excess of the maximum system pressure for two hours.	Document hydrostatic test for the turbine bearings and all charcoal filter systems.	Hydrostatic testing complete. M&MPC is to review test results by fuel load.

NFPA 15 - 1985, "Standard for Water Spray Fixed Systems for Fire Protection"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
5	NFPA 15, para. 5-4.1 & 5-4.2, All operating parts of the system, including automatic detection equipment, shall be fully tested to assure they are in operating condition.	Testing is not complete.	Testing of HVAC charcoal filter deluge systems to be complete after completion of the HVAC system. Other deluge systems to be complete and tested by fuel load except for turbine bearings (prior to exceeding 5% power). M&MPC is to review test results contingent on the above actions.
6*	NFPA 15, para. 2-6, Hangers shall be approved.	Hangers are not listed in safety related areas.	Hanger supports in Containment, Auxiliary Building and Fuel Handling Building are seismically designed by Sargent & Lundy to ANSI B31.1 and are considered acceptable.
7*	NFPA 15, para 2-7, All valves shall be approved.	The Anchor-Darling, Target Rock solenoid, Rockwell Edwards, and ITT Grinnell valves on the charcoal filters units are not listed.	The valves are designed to ANSI Standards and a working pressure of 285 psi. and are considered acceptable.
8	NFPA 15, para. 2-1.2, Only listed devices shall be employed.	The Namco Controls and Micro Switch Co. valve position limit switches on the charcoal filters are not listed.	The Namco switch is manufactured for nuclear environments and the Micro switch device has a U.L. electrical listing. The switches are utilized for special applications and will be tested periodically and are acceptable as is.

NFPA 15 - 1985, "Standard for Water Spray Fixed Systems for Fire Protection"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
9*	NFPA 15, para 2-1.2, Only listed devices shall be employed.	The Spraying Systems Co. nozzles on the charcoal filters are not listed.	The unique configuration of each charcoal filter requires a specialized nozzle for adequate water spray application. There are no listed nozzles available for this purpose. The existing equipment is acceptable.
10*	NFPA 15, para. 2-8.4, Automatic detection equipment shall be listed.	The following charcoal filters utilize United Electric or Conax heat detection devices that are not specfically listed for fire protection service: 1VP05FA & FB, 2VP05FA & FB OVC05FA & FB, OVC06FA & FB OVF04F, 1VQ09F, 2VQ09F, OOG04F & 5F, OVW012F/18F, and OVV21F & 22F.	The United Electric devices are U.L. listed for hazardous atmospheres and the Conax RTD thermo-couples are industrial grade heat sensing devices. The detectors are an acceptable design for alarm purposes since the water spray systems are actuated manually
11	NFPA 15, para. 2-8.4, Automatic detection equipment shall be listed for the intended usage.	A listed detection system is not yet installed in charcoal filters: OVA05FA, FB, FC, FD, FE, FF, FG, FH, FI, OVA09FA & FB, and OVC02FA & FB.	Installation and testing will be complete after HVAC system completion.

NFPA 15 - 1985, "Standard for Water Spray Fixed Systems for Fire Protection"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
12	NFPA 15, para. 2-2, Threaded ends of galvanized pipe shall be protected against corrosion.	Outdoor transformer piping is exposed.	To be corrected by commercial operation.
13	NFPA 15, para. 4-2, Complete working plans, specifications and hydraulic calculations shall be prepared.	Drawings are not up-to-date.	Ongoing project to update "as-built" drawings. To be complete by commercial operation.
14	NFPA 15, para. 4-6.2, Adequate provisions shall be made to promptly and effectively dispose of all liquids from the fire area during operation of all systems in the fire area.	Charcoal filter drains not sized for largest possible water flow.	Administrative procedures have been written to address potential overflow. This is acceptable.

NFPA 16 - 1980, "Standard for the Installation of Deluge Foam-Water Sprinkler Systems and Foam-Water Spray Systems"

Item	NFPA Reference	Deviation	Comments/Resolution
1	NFPA 16, para. 2-1, All component parts shall be listed.	The ASCO "Redhat" solenoid valve and Rockwood model A-20 pneumatic actuator are not listed.	A listed solenoid valve is not available for this installation. Upon testing completion, the equipment should be acceptable.
2	NFPA 16, para. 5-3.1, An acceptance test shall be conducted.	Testing is not complete.	To do by fuel load. M&MPC is to review results prior to exceeding 5% power.
3	NFPA 16, para 2-1, All components shall be listed.	Local panels 1FP05J and 2FP05J are not listed.	Panels were custom designed to operate at 125V dc which is the main reason for no listing. Upon completion of pre-op test, the panels should be acceptable.
4	NFPA 16, para. 5-1.1, Underground mains and lead-in connections shall be flushed before connection to system piping.	Connections were made prior to system flush.	System flush complete. M&MPC is to review results prior to exceeding 5% power.
5	NFPA 16, para. 4-1.1, Working plans shall conform to the installation.	Drawings are not up to date.	Ongoing project to update "as-built" drawings. To be completed by commercial operation.

NFPA 20 - 1983, "Standard for the Installation of Centrifugal Fire Pumps"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 20, para. 2-7.6 and 8-3.1, The floor shall be pitched for adequate drainage of escaping water or fuel away from the pump, driver, controller, fuel tank, etc. The pump room shall be provided with a floor drain.	The diesel fire pump room floor is pitched towards a floor drain that coantains a sleeved pipe with an opening 4" above the floor.	The entire room is designed as a curbed area inside the Lake Screen House. This is considered adequate.
2*	NFPA 20, para. 2-10.5, Listed valves shall be installed on the system side of the check valve.	Powell gate valves are not listed.	The Powell valves are designed to ANSI Standards and working pressure of 285 psi and are considered acceptable.
3*	NFPA 10, para. 2-13.3.1, Hose valves shall be listed.	Vogt gate valves are not listed (test header).	The Vogt test header valves are designed to ANSI Standards and working pressure of 740 psi and are considered acceptable.
4*	NFPA 20, para. 2-13.3.1, Test header pipe shall be 12".	A 10" pipe is installed.	The 10" test header pipe provides adequate flow as recorded on all previous fire pump tests. Therefore, the 10" line is acceptable.
5*	NFPA 20, para. 6-3.1.1, Fire pump feeder conductors inside buildings shall be enclosed by 2" of concrete or equivalent 1-hour fire resistance.	Some conductors are not in concrete (elec. pump).	All conductors are in heavy steel conduit that will provide fire resistance and the cable routing is acceptable.

NFPA 20 - 1983, "Standard for the Installation of Centrifugal Fire Pumps"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
6*	NFPA 20, para. 7-1.1.1, All controllers shall be listed for electric motor driven fire pump service.	Electric motor controller is not listed.	Justification is provided in T. R. Tramm's letter of 12-14-83 to H. R. Denton.
7*	NFPA 20, para, 7-1.1.3, 7-3.7.1, 7-3.8 & 7-3.9, Wiring diagrams, marking of each motor control device, and instructions shall be mounted on the controller.	All electrical information is not attached to the controller on the electric motor-driven fire pump.	Complete electrical information including diagrams, ratings, and vendor manuals are permanently on file at the station. The data is retrievable via equiment identification number. Therefore, all pertinent data is available when required.
8*	NFPA 20, para. 7-4.3, An overcurrent protective device shall be located within the fire pump controller.	Overcurrent device is not located within the fire pump controller.	Overcurrent protection is provided from 4160V switchgear bus 144, cubicle 000 and considered acceptable.
9*	NFPA 20, para. 7-4.6 Alarms shall be provided for (b) loss of line power, and (c) phase reversal.	Line power is monitored on the feeder source and there is no phase reversal alarm.	Loss of power on the 4160V bus which feeds the fire pump motor is annunciated on control room panel 1PM07J. Phase reversal is highly improbable and therefore is not alarmed.
10*	NFPA 20, para. 7-6.2, An ammeter and voltmeter shall be provided on the controller.	An ammeter is attached to the electric pump controller, but not a voltmeter.	For testing, provisions are made to measure volts and amps. This is acceptable for testing and surveillance purposes.

NFPA 20 - 1983, "Standard for the Installation of Centrifugal Fire Pumps"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
11*	NFPA 20, para. 8-2.7.2, The automatic electric solenoid valve in the cooling water line for the heat exchanger shall be listed for fire protection service.	The solenoid valve is not listed.	A listed valve is not available in the required pressure rating for the diesel engine pump. The existing valve has tested satisfactory and is considered acceptable.
12*	NFPA 20, para. 9-4.2.2, An alarm shall be provided indicating that the controller switch has been turned to the off or manual position (separate signal).	The off and manual positions on the diesel engine pump are combined with other trouble condition alarms.	Control room alarm response procedure BWAR-0-38-C7 addresses trouble conditions including controller position "off". Since all trouble conditions are investigated, a separate signal is not necessary.
13*	NFPA 20, para. 2-4, Pumps shall be provided with an accurate nameplate.	Nameplate data on electric motor-driven pump indicates BHP-3202.	Accurate brake horsepower data is provided on vendor drawings and manual, and is on file at the station.
14	NFPA 20, para. 11-2.6.3.3, The governor shall be set to properly regulate engine speed.	The diesel engine overspeed cable is inoperative.	A new overspeed cable will be installed and tested by fuel load.
15	NFPA 20, para. 2-7.1, The fire pump room shall be protected against possible interruption of service caused by fire or other adverse conditions.	Pipe penetration is not sealed in the diesel fire pump room wall.	To seal penetration by fuel load.

NFPA 24 - 1984, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1*	NFPA 24, para. 3-1.1, All control valves shall be listed.	Essential service water valves OSX172 and OSX174, and the Powell and Anchor-Darling valves are not listed.	The SX valves are ASME section III, and provide a cross-tie to ensure a seismically qualified back-up water supply to portions of Category I standpipes in safety related areas. The Powell and Anchor-Darling valves are designed to ANSI Standards and working pressure of 285 psi. These valves are considered acceptable.
2*	NFPA 24, para 3-2.2, A check valve shall be installed in each connection.	Check valves are not installed at the connections to essential service water (SX), make-up demineralized water, and the station air compressors.	The valved connections are normally closed with procedures written to monitor potential leakage. This is considered acceptable.
3	NFPA 24, para. 3-3.1 & 3-1.1, Every conncection from the fire main to a building shall be provided with a listed indicating valve, unless a non-indicating underground gate valve with roadway box and T-wrench is accepted by the authority having jurisdiction	Valve OFP590 for the Gate House hose stations is a non-indicating underground valve with roadway box.	Procedures are written to surveil the valve, and T-wrenches are available to operating personnel. This is considered acceptable.

NFPA 24 - 1984, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
4*	NFPA 24, para. 3-3.2, Post indicator valves shall be located not less than 40 ft. from buildings.	The following valves are less than the 40 ft. distance: OFP579, OFP580, OFP581, OFP582, OFP591, OFP592, OFP593, OFP602	The valves are located along blank walls and are accessible. This is considered adequate.
5	NFPA 24, para. 4-2.3, Hydrants shall be at least 40 ft. from buildings.	The following hydrants are less than the 40 ft. distance: OFP05S, OFP07S, OFP21S, OFP23S, OPF24S	The hydrants are located along blank walls and can be isolated from the fire main. This is considered acceptable.
6*	NFPA 24, para. 8-6.2.10, Thrust blocks or other suitable means of restraint shall be provided at fittings for each change in direction of a pipeline and at tees, plugs, caps, and bends.	Insufficient documentation to determine thrust restraint locations on flanged hydrant connections.	Procedure BwVS 700-1 will monitor any unusual system leakage. Thrust blocks have been provided as necessary during routine maintenance and hydrant repositioning. The present anchoring is considered adequate.
7*	NFPA 24, para. 7-2, All ferrous metal pipe shall be lined.	Pipe is not lined.	Periodic flow tests will monitor the interior condition of the pipe. Hydraulic calculations will also utilize a conservative C factor of 100 to account for extended age. This is adequate in lieu of lining pipe.

NFPA 24 - 1984, "Standard for the Installation of Private Fire Service Mains and Their Appurtenances"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
8	NFPA 24, para. 8-8.1, Underground mains and lead-in connections shall be flushed before connection is made to sprinkler systems, standpipes, and other fire protection piping.	Connections were made prior to system flush.	System flush has been completed. M&MPC will review flush test results prior to exceeding 5% power.

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 7½ hours of training 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 PCB's prior to exceeding 5% power.

NFPA 30 - 1984, "Flammable and Combustible Liquids Code"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 30, para. 2-7.1, All tanks shall be tested as evidence of an ASME Code Stamp or U.L. label. Tanks not marked shall be tested with good engineering principles.	Provide testing documentation for: 0D003T, 0D012T, 1T001T, 0T001T and 0T002T.	M&MPC is to review N stamp data prior to fuel load.
2	NFPA 30, para. 2-7.2, When the vertical length of fill or vent pipes is such that when filled with liquid the static head imposed on the bottom of the tank exceeds 10 psi, the tank and piping shall be hydrostatically tested equal to the static head.	Provide hydro. test documentation for: 0D003T, 00D01TA, 0T001T, 0T002T and 0D005T.	M&MPC is to review test data by initial criticality.
3	NFPA 30, para. 3-7.1, NFPA 37, para. 5-7.1, Unless tested in accordance with ANSI B31, all piping shall be hydrostatically tested to 150% of the maximum system pressure or 110% pneumatically, but not less than 5 psig at the highest point for 10 minutes.	Provide piping hydro. test documentation for: 0D003T, 0D012T, 00D01TA, 1T001T, 1D011T, 0T001T, 0T002T, 1D001TA, TC, TB & TD, 1D002TA &TB, 0D006T, 1D010T and 0D005T.	M&MPC is to review test data by initial criticality.

NFPA 30 - 1984, "Flammable and Combustible Liquids Code"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
4	NFPA 30, para. 2-2.5.4, and NFPA 37, para. 5-6.1, The total capacity of venting device(s) shall be in accordance with Table 2-8 (i.e., 699, 380 cubic ft. per hour (CFH) for 0D003T, 563,600 CFH for 0D012T, 38,400 CFH for 00D01TA).	Demonstrate the venting capacity is provided via: 6" breather vent on 0D003T, 6" breather vent on 0D012T, 2" breather vent on 00D01TA.	0D003T and 0D012T are outdoor diesel fuel oil storage tanks that are not required for safe shutdown and no safe shutdown components are located by these tanks. The area is diked and the tanks are protected by foam systems. This is considered acceptable. The vent line on 00D01TA is sized for maximum flow via 2" fill line. In addition, a high level alarm is provided. This is considered adequate.
5	NFPA 30, para. 2-4.4.7, The inlet fill pipe and outlet line shall be located not less than 5 ft. from any building opening and shall be identified.	The fill and outlet connections for 0T001T and 0T002T are within 5 ft. of exterior door D-150. The connections are also not identified.	Door D-150 enters an airlock and a second door D-151. Overflow into the Turbine Building would be limited by these two doors and the airlock. Therefore, relocation is not necessary. Signs will be posted by fuel load.
		The fill line for 0D005T is within 5 ft. of the louver wall opening to the fire pump room. The connection is not identified.	The louvered wall opening is curbed, thus preventing oil flow into the fire pump room. The connection will be labeled by fuel load.

NFPA 30 - 1984, "Flammable and Combustible Liquids Code"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
6	NFPA 30, para. 2-2.3.3. (g)2., Each diked area containing two or more tanks shall be subdivided, preferably by drainage channels or intermediate curbs for each tank in excess of 2,380 bbls. (99,960 gal.).	The outdoor fuel oil tanks are not subdivided within the common diked area.	The diked area is also provided with a storm sewer. In addition, the tanks are protected by automatic foam systems. This is acceptable in lieu of drainage channels or intermediate curbs.

NFPA 37 - 1984 "Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1*	NFPA 37, para. 5-4.2, Tanks shall be provided with high level automatic shutoff.	The following tanks do not have a high level automatic shutoff: 1D002TA & TB and 1D010T.	An automatic shutoff will not be provided on the safety related tanks as they may be required for operation.
2*	NFPA 37, para. 5-3.7.1, At least 15 inch clearance shall be left around the tank.	The following tanks have less than 15 inch clear space: 1D002TA, 1D002TB and 1D010T.	The clearance is sufficient for maintenance and inspection activities.
3	NFPA 37, para. 5-5.3 and NFPA 30, para. 2-4.4.8, Tanks shall be equipped with a device or other suitable means to prevent overflow into the building.	Overflow lines 1D066AA4, AB4, AC4, and AD4 terminate inside tank rooms: 1D00TA, TC, TB & TD.	In tank rooms 1D001TA, TC, TB, & TD, the overflow lines terminate to a floor drain which is piped to a fire and oil sump. This is considered acceptable.
		Tank 0D005T has no overflow line.	Tank 0D005T utilizes a sight tube and gage to observe oil level. This is adequate for filling operations.
		Tank 0D006T overflow line terminates inside the building.	The overflow line on 0D006T terminates in a sump which can be manually pumped out. This is considered acceptable.

NFPA 50A - 1984, "Standard for Caseous Hydrogen Systems at Consumer Sites"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 50A, para.2-4.6, Hydrogen supply units shall be electrically bonded to the system before discharging hydrogen.	The grounding clamp screw threads should be protected against corrosion to assure an adequate ground.	To do by fuel load.
2	NFPA 50A, para. 2-6.1, After installation, all piping, tubing and fittings shall be tested and proved hydrogen gastight at maximum operating pressure.	Document testing.	To do testing by initial criticality. M&MPC is to review test results prior to exceeding 5% power.
3	NFPA 50A, para. 4-1.3, Electrical equipment within 15' shall be in accordance with Article 501 of the National Electric Code for Class I, Division 2 locations.	The Nelson Electric enclosure at top rear of the hydrogen control cabinet is Class I, Division 2, Group B but not U.L. labled.	Per manufacturer, the Class 654 enclosure was not U.L. listed at the time it was purchased and installed. However, the 654 enclosure is now listed and identical to the installed device. Therefore, the equipment is acceptable.

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) Waterflow actuated devices shall be tested every two months.	Waterflow actuated devices are tested quarterly.	Quarterly testing is specified in NFPA 13A as being adequate. Therefore, testing is acceptable.
4	NFPA 72D, para. 2-4.3 (c) Gate valve supervisory switches shall be tested semi-annually.	Gate valve supervisory switches are tested annually.	Supervised valves are also surveilled monthly. Therefore, annual alarm tests should be acceptable.

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

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
5*	NFPA 72D, para. 2.6.2.3, The secondary (standby) supply shall be provided and shall consist of storage batteries with a 24 hour supply, engine driven generators or a combination of engine driven generators and batteries.	The secondary power supply is provided from Bus 134/234 in lieu of storage batteries or generator.	Bus 134/234 is normally fed from Bus 144/244 which is supplied from the system auxiliary transformer, and it also has a diesel generator backup in case of a loss-of-offsite power. This supply is as reliable as was intended by the NFPA code, and is considered to be acceptable.
6*	NFPA 72D, para. 2-6.2.4, A separate power supply, independent of the main power supply shall be provided for the operation of trouble signals.	Trouble signals are fed from the primary source.	Bus 132/232 (ESF Bus) is the primary power supply to the proprietary alarm systems. Due to the high reliability of the primary power supply, this is considered to be acceptable.
7	NFPA 72D, para. 2-6.4.2, The circuit disconnecting means shall be clearly marked "Fire Alarm Circuit Control".	Circuit disconnecting means at MCC 134 x 5, 234 x 5, 132 x 2 and 232 x 2 are not labeled.	To label by fuel load.

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

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
8	NFPA 72D, para. 2-2.2, All devices shall be listed.	Alison panels, model numbers 7081, 7083, 7091 and the Fire Detection and Suppression Input panels and contrtol room annunciator are not listed.	Panels 7081, 7083 and 7091 operate at 125 Vdc which is the main reason for no listing. The other panels utilize the same basic circuitry as F.M. approved panels, but are custom designed with printed circuit boards and cabinets to allow physical space installation requirements. Therefore, upon successful completion of pre-op testing, the panels should be acceptable.
9*	NFPA 72D, para. 3-6.2.2, Signals transmitted shall indicate distinctively the particular function (such as valve position, pressure, etc.) of the automatic sprinkler system which is abnormal and its restoration to a normal condition.	Common trouble alarm indications are provided.	Upon receipt of a trouble alarm, an operator is dispatched to the area and fire watch may be initiated until the trouble is cleared. This is considered acceptable.
10*	NFPA 72D, para. 4-4.1, Provide separate, distinctive, audible trouble and alarm signals at the Control Room panels 1PM09J/2PM09J.	Distinctive audible alarm and trouble indications are not provided between Unit 1 & 2 panels.	The Unit 1 and 2 fire alarm panels are 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. This is considered acceptable.

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

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
11*	NFPA 72D, para. 3-5.1.2 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.	Ionization detection systems do not have this trouble feature.	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 acceptable.

NFPA 72E - 1984, "Standard on Automatic Fire Detectors

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 72E, para. 2-5.1.3, The installing contractor shall furnish a written statement to the effect that detectors have been installed in accordance with approved plans.	Detector installation is not complete.	Detectors are to be installed by initial criticality.
2	NFPA 72E, para. 2-5.2, A satisfactory test in accordance with Chapter 8 shall be made.	Document test.	Testing to be complete and M&MPC is to review results prior to exceeding 5% power.
3*	NFPA 72E, para. 2-5.1.1, All fire detection devices shall be listed.	The following charcoal filters utilize United Electric or Conax heat detection devices that are not specifically listed for fire protection service: 1VP05FA & FB, 2VP05FA & FB, OVC05FA & FB, OVC06FA & FB OVF04F, 1VQ09F, 2VQ09F, OOG04F/5F, OVV21F & 22F and OVW12F/18F.	The United Electric devices are U.L. listed for hazardous atmospheres and the Conax RTD thermocouples are industrial grade heat sensing devices. These devices are an acceptable design for alarm purposes since the water spray systems are actuated manually.
4	NFPA 72E, para. 8-3, Detectors shall be tested periodically.	Testing procedures are not complete for sensitivity.	Procedure(s) are to be complete by fuel load. M&MPC is to review prior to exceeding 5% power.

NFPA 80 - 1983, "Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFFA 80, para. 1-6.1, Only labeled or listed doors shall be used.	The labels for several doors are either missing, damaged, or illegible. Piano-type hinges are installed the length of some doors and the labeling could not be verified.	A certificate of conformance from the manufacturer is on file stating that the referenced doors were manufactured and delivered as listed fire doors.
2*	NFPA 80, para. 1-6.1, Only labeled or listed doors shall be used.	Several security doors are either oversized or provided with a modified two-point latch and electric strike. The doors are not labeled.	The justificatior for the use of non-labeled doors of "A construction" is contained on pages 2.1-8 through 2.1-9b of the Braidwood Fire Protection Report.
3*	NFPA 80, para. 1-6.3, Authorities having jurisdiction shall be consulted as to the size of oversized doors which may be deemed acceptable in a given location.	Several oversized doors are not labeled.	The justification for the use of non-labeled doors of "A construction" is contained on pages 2.1-8 through 2.1-9b of the Braidwood Fire Protection Report.
4	NFPA 80, para. 2-5.1, Only labeled door frames shall be used.	Labels for several door frames are either missing or illegible. The doors installed in some frames are provided with piano-type hinges which run the length of the frame and labeling could not be verified.	A certificate of conformance from the manufacturer is on file stating that the referenced frames were manufactured and delivered as listed frames.

NFPA 80 - 1983, Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
5*	NFPA 80, para. 2-5.1, Only labeled door frames shall be used.	Several security doors have been modified with security hardware.	The justification for the use of these frames is provided on pages 2.1-8 through 2.1-9b of the Braidwood Fire Protection Report.
6*	NFPA 80, para. 2-5.4, The clearance between doors and frames and the clearance between the meeting edges of doors swinging in pairs shall not exceed 1/8 inch.	The gaps around several doors were measured to be between 1/8 and 1/4 inch.	These doors are considered to be within the manufacturer's tolerances for doors and frames as specified by the Steel Door Institute. This is considered acceptable.
		The gap between the meeting edge of these double doors could not be measured as either a double astragal or an astragal and weather stripping was provided. Door numbers: 318, SD-169, SD-172, SD-174, SD-175.	Gaps are to be verified by fuel load.
		The gaps around these doors were measured to be greater than 1/4 inch: Door numbers; 8, 36, 94, 147, 212, 433, SD-172.	Doors are to be repaired by fuel load.

NFPA 80 - 1983 "Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
7	NFPA 80, para. 2-5.4, The clearance between the bottom of a door and sill shall not exceed 3/8 inch. Where there is no sill, clearance shall not exceed 3/4 inch.	Gaps at the bottom of several doors exceeded the clearance criteria. (Ref. G. K. Newburg procedure "Work Instructions for Verification and Etching of Doors and Door Frames".)	Repairs to be made by initial criticality.
8*	NFPA 80, para. 2-8.2.1, Only labeled locks and latches shall be used.	Several doors are provided with security hardware.	The justification for non-labeled hardware for security doors is contained on pages 2.1-8 through 2.1-9b of the Braidwood Fire Protection Report.
9	NFPA 80, para. 2-8.4.1, Where there is an astragal or projecting latch bolt that prevents the inactive door leaf from closing and latching before the active door closes, a coordinating device shall be used.	These doors are not provided with a coordinating device: SD-172 and SD-174.	Coordinating device is to be installed by fuel load.
10	NFPA 80, para. 2-8.4.2, A closing device shall be provided on every fire door.	These doors are not provided with a closing device: 417, 435, and 441.	Closing device is to be installed by fuel load.
11	NFPA 80, para. 2-8.4.4, All closing devices shall be adjusted to overcome the resistance of the latch mechanism so that positive latching is achieved on each door operation.	Several doors do not properly latch when closed.	To be adjusted by fuel load.

NFPA 80 - 1983 "Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
12	NFPA 80, para. 2-8.9.3, All components of a fire door assembly shall be firmly attached to walls, doors and frames.	The closing device on doors 420 and 509 is disconnected. The latching hardware is loose on door 72. The astragal is damaged and loose on door 433. The door knob has been removed on door 725. The strike plate in the inactive leaf of double doors is missing on doors SD-172 and SD-174.	Repairs are to be made by fuel load.
13*	NFPA 80, para. 2-9, Gasketing on fire doors or frames shall be furnished only in accordance with the published listing of the door frame or gasketing material manufacturer. Exception: Where acceptable to the authority having jurisdiction, gasketing of non-combustible or limited combustible material may be applied to the frame providing closing and latching of the door is not thereby inhibited.	Several doors are provided with gasketing around the frame.	Gasketing is installed to assist the HVAC air flow/ pressurization within the plant. The gasketing does not affect the operability of the door and is considered acceptable.

NFPA 80 - 1983, "Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
14	NFPA 80, para. 14-12, Fire doors shall be operable at all times.	Several doors have not been installed.	Remaining doors for Unit 1 operation will be installed by initial criticality.
15	NFPA 80, para. 14-12, Fire doors shall be operable at all times.	Several doors were locked and could not be checked at the time of the review.	Doors will be inspected by initial criticality.
16	NFPA 80, para. 14-1.4, Repairs shall be made and defects that may interfere with operation shall be corrected.	Double door SD-174 is misaligned and the meeting edges collide, not allowing door to close. The frame of door 432 is damaged.	Repairs are to be made by fuel load.
17	NFPA 80, para. 14.2.3.1, Door openings and surrounding areas shall be kept clear of everything that would be likely to obstruct or interfere with the free operation of the door.	Several doors are blocked open by cables and other equipment passing through the door opening. (Clearances between the doors and frame and proper closing and latching of the doors could not be checked at this time).	Obstructions are to be removed and clearances checked by fuel load if possible. Compensatory measures will be implemented for doors with obstructions.

NFPA 80 - 1983, "Standard for Fire Doors and Windows"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
18	NFPA 80, para. 14-2.5.2, Any breaks in the face coverings of doors shall be repaired.	There is a hole in the door face for a lock which has not been installed in doors 6 and 63. There are screw holes in the door face at the upper right portion of door 30. Door 140 is damaged above center hinge. There are holes in the door face near the latch. (doors 158 and 185)	Repairs are to be made by initial criticality.

NFPA 90A - 1985, "Standard for the Installation of Air Conditioning and Ventilating Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 90A, para. 3-3.7.1.6, Closing of all fire dampers shall be automatic and they shall remain tightly closed.	a) The electro thermal link (ETL) flex conduit on the following dampers appears too long and may get caught in the track: OVA384Y OVC186Y OVA450Y 1VD63Y b) Several ETL's are not yet wired for operation. c) Debris in track of dampers OVA455Y, OVC052Y, and 1VX24Y may prevent closing. d) Damper OVC087Y has a fusible link, but is listed as having an ETL.	Completion of this work is to be in conjunction with the HVAC system completion.
2	NFPA 90A, para. 303.7.2.2, Fire dampers shall be installed in accordance with their listing.	Dampers OVA451Y, OVA481Y, and OVA484Y are not installed. In addition, several dampers were inaccessible due to temporary obstructions.	Completion of this work is to be in conjunction with the HVAC system completion.
3	NFPA 90A, para. 4-5.1, Detectors shall be periodically tested per NFPA 72D.	Duct detector test procedures are not complete for sensitivity and the photo electric unit.	Procedures are to be complete by initial criticality.

NFPA 90A - 1985, "Standard for the Installation of Air Conditioning and Ventilating Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
4	NFPA 90A, para. 4-5.1, Detectors shall be installed and tested in accordance with NFPA 72E.	Duct detector installation is not complete.	Completion of this work is to be in conjunction with the HVAC system completion.
5	NFPA 90A, para. 4-3 (a)&(b), In systems over 2,000 cfm, listed smoke detectors shall be installed and automatically stop the fan(s).	Not all duct detectors stop the fan(s).	Sargent & Lundy's NFPA 90A compliance checklist dated 2/20/85 identifies detector functions. M&MPC is to review justifications prior to exceeding 5% power.
6	NFPA 90A, para. 2-1.4.1, A service opening shall be provided in ducts adjacent to each fire damper and smoke detector to permit maintenance and resetting of the device.	In process of installing service openings.	Completion of this work is to be in conjunction with the HVAC system completion.
7	NFPA 90A, para. 2-1.4.2, Service openings shall be identified with letters to indicate the location of the fire protection devices within.	Labeling is not complete.	Completion of this work is to be in conjunction with the HVAC system completion.

NFPA 90A - 1985, "Standard for the Installation of Air Conditioning and Ventilating Systems"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
8*	NFPA 90A, para. 4-5.1, 4-5.2, and 4-5.3, Detectors shall be installed in accordance with NFPA 72E and shall sound an alarm in a normally occupied area or through the building fire alarm system.	The duct detectors alarm in the main control room HVAC panel as common fire or trouble alarms and are not installed on the fire alarm system per NFPA 72E or 72D.	The common fire/trouble alarm in the main control room also records a printed message which indicates the local HVAC panel. The local HVAC panel indicates separate fire and trouble alarms. Operating procedures address these alarm conditions. This is acceptable for the duct detector alarm system.
9	NFPA 90A, para. 2-4.1, Air filters shall have a U.L. Class 1 or 2 rating.	Filters are not installed.	Filters are to be Class 1 or 2.
10	NFPA 90A, para. 4-4, Smoke dampers shall be installed in systems over 15,000 cfm, except where dampers are functioning as part of a smoke control system.	Smoke dampers are not installed.	Smoke removal plan procedure BWOP FP-27 will utilize the HVAC system including dampers, duct detectors, fan interlocks, and portable smoke ejectors to provide smoke control. M&MPC is to review the procedure prior to exceeding 5% power.

NFPA 232 - 1980, "Standard for the Protection of Records"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
1	NFPA 232, para. 2-4 & 2-14.1, A vault shall not exceed 5,000 cu. ft. An oversize vault not over 25,000 cu. ft. may be used and equipped with automatic sprinkler protection.	The QA vault is approximately 8,450 cu. ft. and is not equipped with automatic sprinklers.	The QA vault is protected by an automatic Halon 1301 fire suppression system with a connected reserve. This is adequate protection in lieu of sprinklers.
2	NFPA 232, para. 2-14.2, Where mobile shelving is used, smoke detectors shall be provided in addition to automatic sprinklers.	Automatic sprinklers are not provided in the Q.A. vault.	Smoke detectors associated with the Halon 1301 suppression system are provided. This is acceptable.
3	NFPA 232, para. 2-10.4, Doors shall be equipped with an automatic closing device and a heat actuated or smoke actuated release to close them.	A heat or smoke actuated device does not close the door (QA vault).	The door is normally locked closed and is equipped with an automatic door closure. A heat or smoke interlocking device is not necessary for this reason.
4	NFPA 232, para. 2-9.2 Roofs of vaults shall not be pierced for any purpose.	HVAC supply and exhaust ducts penetrate roof (QA vault).	HVAC openings are protected by a series of two 1½-hr. fire reated dampers that will automatically close upon fire or actuation of the halon system. This provides a fire barrier for the roof and is acceptable.

NFPA 232 - 1960, "Standard for the Protection of Records"

ITEM	NFPA REFERENCE	Deviation	Comments/Resolution
5	NFPA 232, para. 2-10.1, The vault shall be provided with a listed 4-hr. door.	A 3-hr. U.L. labeled door is installed (QA vault).	Based on external fire exposure, the 3-hr. door provides adequate protection.
6	NFPA 232, para. 2-11.2, Lighting shall be vapor proof or explosion proof controlled by a switch outside the vault. No other electrical devices shall be permitted within the vault.	The lighting switch is inside the vault in addition to a telephone, thermostat, exit sign, and a temp/humidity recorder (QA vault).	Electrics have been installed per the National Electrical Code and present no inherent hazard. In addition, U.L. listed Class P gasketed light fixtures are installed with thermal ballast protection. This is acceptable.