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

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

February 29, 1988

Docket No. 50-336
B12810
A06807
Re: 10CFR50, Appendix R

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
10CFR50, Appendix R
Request for Exemption

By letter dated September 25, 1987,(1) the NRC Staff transmitted to Northeast Nuclear Energy Company (NNECO) an inspection report providing the results of an NRC special team safety inspection of Millstone Unit No. 2's conformance with sections of 10CFR50, Appendix R, Fire Protection. The inspection report identified one violation of 10CFR50, Appendix R, Section III.G.2.b, in that redundant Isolation Valves 2FW43A and B of the auxiliary feedwater headers were separated by less than the required horizontal distance of 20 feet, and there were intervening combustibles present with no suppression and detection capabilities.

In a letter dated October 23, 1987,(2) NNECO provided the NRC Staff with the response to the inspection report and committed to submit an exemption request to the NRC Staff addressing the subject auxiliary feedwater valves. NNECO provided the NRC Staff with February 1, 1988, as the estimated exemption request submittal date. The exemption request is provided as Attachment 1.

The concept of equivalent fire protection was established in Appendix A to Branch Technical Position APCSB 9.5.1 which recognized that there were unique plant configurations that required fire protection features that are not identical to those listed as acceptable by the NRC Staff. Some of these arrangements have been accepted by the NRC Staff as providing equivalent protection to the requirements of Section III.G of Appendix R based on the

(1) W. V. Johnston letter to E. J. Mroczka, dated September 25, 1987, "Inspection No. 50-336/87-16."

(2) Letter dated October 23, 1987, "Millstone Nuclear Power Station Unit No. 2, Response to Inspection Report No. 50-336/87-16."

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licensee's Fire Hazard Analysis. The exemption provisions of 10CFR50.48(c)(6) and 10CFR50.12(a) allow exemption requests if a licensee can show that the required plant modifications to meet one of the three stipulated requirements of Section III of Appendix R would not enhance fire protection safety in the facility, and the present configuration provides or ensures an equivalent level of fire protection.

NNECO requests that the NRC Staff apply this concept to the exemption requested in Attachment 1 since the application of regulations in this particular circumstance is not necessary to achieve, or would not serve, the underlying purpose of 10CFR50, Appendix R. The purpose of Section III.G of Appendix R is to provide adequate fire protection to structures, systems, and components important to safe shutdown. NNECO believes that the existing plant configuration discussed in Attachment 1 fully satisfies this requirement. There is no need to provide additional protection or separation between redundant components that will continue to fulfill their required functions in the event of a fire. Also, NNECO believes that the exemption requested in Attachment 1 satisfies the standards of 10CFR50.12(a)(1) and 10CFR50.12(a)(2)(ii), in that: (1) this exemption, as described in Attachment 1, will not present an undue risk to the public health and safety, and is consistent with the common defense and security; and (2) special circumstances are present for this exemption in that the application of the regulation in this particular circumstance is not necessary to achieve the underlying purposes of Appendix R to 10CFR Part 50.

In addition, NNECO has held discussions with the NRC Resident Inspector and the NRC Region I Staff concerning the acceptability of suspending the hourly fire watch patrol after submission of this exemption to the NRC Staff. NNECO maintains that there are no safety concerns associated with the removal of the fire watch patrol and intends to suspend the fire watch patrol upon receiving concurrence from the NRC Resident and Region I Staff, expected on March 4, 1988.

Pursuant to the requirements of 10CFR170.12(c), enclosed with this exemption request is the application fee of $150.

We hope you will find this information satisfactory, and we remain available to answer any questions you may have.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
D. H. Jaffe, NRC Project Manager, Millstone Unit No. 2
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

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B128.0

Attachment 1

Exemption Request

February 1988

Millstone Unit No. 2
Exemption Request

Exemption Request

Section III.G(1)(a) of 10CFR50, Appendix R, requires that one safe shutdown train remains free of fire damage. To assure that one train remains free of fire damages, Section III.G(2)(b) of 10CFR50 requires that a 20-foot separation zone free of intervening combustibles with suppression and detection exists between redundant components.

NNECO requests an exemption from the above requirement of Section III.G(2)(b) of 10CFR50, Appendix R, requiring a 20-foot separation free of intervening combustibles for the redundant Isolations Valves 2FW43A and B of the auxiliary feedwater heaters.

Description

The auxiliary Feedwater Control Valves 2FW43A and B are normally closed. At least one of the two valves is required to open to permit flow of auxiliary feedwater to a steam generator upon loss of normal feedwater. The valves are located on the 14'-06" elevation of the turbine building (Fire Area R-3). The valves and their control cables are separated by less than 20 feet with no fire barriers. Section III.G.2 of 10CFR50, Appendix R, specifies requirements for the separation of cables and equipment . . . "that could prevent operation or cause maloperation due to hot shorts, open circuits or shorts to ground, of redundant trains of systems necessary to achieve and maintain hot shutdown conditions . . . ." A circuit analysis was performed as part of the Appendix R compliance review which concluded that the only credible failure due to damage from a fire in Fire Area R-3 would cause the valves to go to the required open position. Therefore, fire damage could not prevent operation of the auxiliary feedwater system. On this basis, it was NNECO's position that the separation requirements of III.G.2 were not applicable and that the valves, although not free from "fire damage," would open and an operable flow path would be maintained. However, due to the critical nature of these valves, NNECO agreed during the Appendix R audit conducted by the NRC during the week of July 13, 1987, to formally submit the failure analysis and request an exemption to Section III.G.2 of Appendix R.

Area Fire Hazard Analysis

The area Fire Hazard Analysis, as submitted previously to the NRC Staff in the Millstone Unit No. 2 Fire Hazard Analysis, is provided as Enclosure 1 to this attachment.

Justification for Exemption

The purpose of this analysis is to show that a fire in the vicinity of 2FW43A and B would result in the valve failing open. The analysis specifically addresses 2FW43A. The analysis of 2FW43B would be similar and would result in the same conclusion.

The valves are air-operated. Upon loss of air to the operator, the valves will fail open. They are equipped with pneumatic positioners for remote valve position control. The positioner is controlled by a Foxboro I/P converter (PY5276). The air supply to the valve operator is controlled by a normally energized, three-way solenoid (HY5276) located at the valve. To initiate auxiliary feedwater, this solenoid would be de-energized to vent air from the operator allowing the operator spring to fully open the valve.

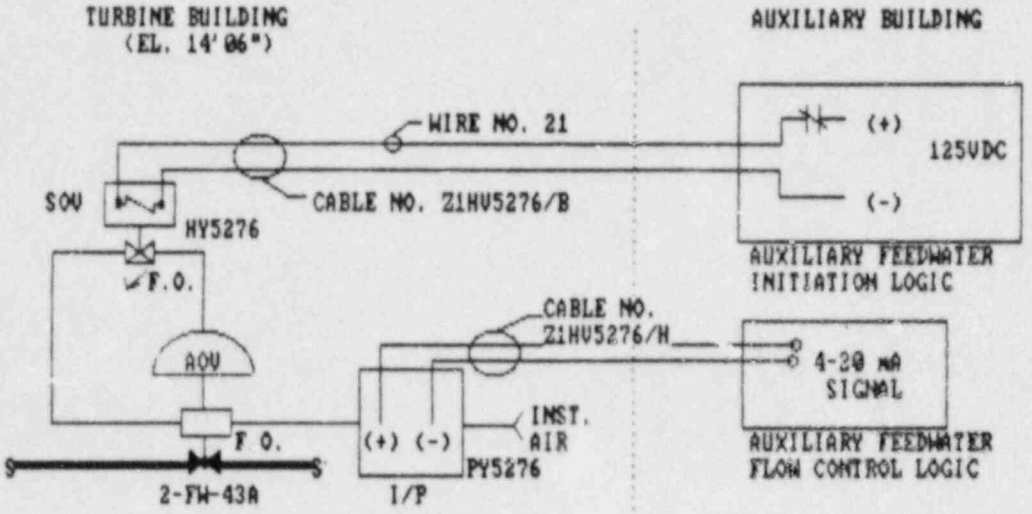
One possible failure is a 125-VDC (+) hot short to Wire No. 21 of Cable Z1HV5276/B (reference attached sketch). This hot short would prevent de-energization of HY5276. However, even with this solenoid energized, the valve can still be opened pneumatically by the positioner mechanism. Therefore, an additional failure is required to prevent this valve from opening.

The second failure required would be a hot short to PY5276, which operates on a 4-20 ma signal from a 10-VDC power supply. On loss of the signal due to opens or shorts to ground, the valve would go to the fully open position. The only available potential within the same conduit in Fire Area R-3 with the cable to PY5276 is $\pm$ 125 VDC. Per conversations with the manufacturer, a two-wire (one positive and one negative) 125-VDC hot short applied to PY5276 would cause the low-voltage device to fail in the loss of signal condition causing the valve to open. If the impedance of the hot short did result in a reduced voltage below the failure threshold of the device, it would have to be of the correct polarity to cause the device to supply air to close the valve. The probability of a two-wire DC hot short of the correct polarity occurring from an external cable is sufficiently low to consider the occurrence of the event incredible. This is consistent with guidance provided in Generic Letter 86-10.

In summary, a two-wire DC high-impedance hot short of the correct polarity, which alone is not credible, would have to occur in conjunction with a single-wire hot short on HV5276 to prevent 2FW43A or B from opening. It is important to note that since these dual failures would have to occur to both valves concurrently to render the auxiliary feedwater system inoperable, it is concluded that a fire in Fire Area R-3 could not prevent the opening of at least one of the two valves, and auxiliary feedwater would remain operable.

Note that this analysis does not take credit for the loss of the air supply to the valve operators, which could occur as a result of the fire and which would result in both valves opening regardless of the state of the electrical control units.

Based on the above, NNECO maintains that a fire in Fire Area R-3 would not prevent auxiliary feedwater from being supplied to the steam generators, and that this analysis provides the justification for the requested exemption.



(VALVE SHOWN IN CLOSED POSITION)

SKETCH OF 2-FW-43A

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Enclosure 1

Fire Hazard Analysis

February 1988

Turbine Building
General Elevation

Fire Area No. T-1
Zone A
El. 14' 6"

Appendix R, Fire Area
R-3

MAJOR EQUIPMENT

Safe Shutdown

- Instrument air compressors (for shutdown)
- Auxiliary feedwater cables (Trains A, B, & C)
- Service Water Cables (Trains A, B, & C)
- Auxiliary Feed Valves (2-FW-43 A & B)

Safety Related

- None

Nonsafety Related

- None

FIRE PROTECTION

Suppression

- Wet-pipe automatic sprinkler systems provided for the north and south sides. The system control valves (2-FIRE-28 and 2-FIRE-33) are located at columns 18-E and 24-E, elevation 14'6", respectively. The systems alarm at the main fire alarm control panel C-26, Zone 4(N) and Zone 33(S).

- Hose stations are located throughout the zone.

- Dry chemical and carbon dioxide portable fire extinguishers are located throughout the Fire Zone.

- The auxiliary feed pump cable trays are protected with a wet pipe automatic sprinkler system. The system does not have a control valve.

- The tool and equipment storage areas are protected with wet-pipe automatic sprinkler protection. The system control valve (2-FIRE-87) is located at column 25-E.5, elevation 31'-6". The system alarms at the main fire alarm panel C-26, Zone 16.

Detection

- None

DESIGN FEATURES

- Ceiling - Open grating separates elevations 14'6" and 31'6".
- Floor - Concrete on grade.
- North Boundary - 12 inch thick reinforced concrete exterior wall.
- South Boundary - Nominal 12 inch thick concrete block wall to Unit 1 with a rolling steel, 3 hour rated, Class A fire door; 12 inch thick concrete block wall to Fire Area T-2 with a 3 hour, Class A door. These walls provide an approved 3 hour rated fire barrier.
- East Boundary - 12 inch thick reinforced concrete exterior wall.
- West Boundary - 2 feet thick reinforced concrete wall to the Auxiliary Building.
- Large openings are located in the ceiling to upper levels of the Turbine Building.

COMBUSTIBLE LOADING

Floor Area = 31,802 square feet

COMBUSTIBLE MATERIAL	QUANTITY	HEAT POTENTIAL (BTUs)
Cables	596.35 cf	274,343,532
*Lube Oil (Transient)	6,400 gal.	925,420,800

*supply for Turbine Lube oil system passes through the zone.

Heat Potential (BTU/ft^2) = 37,726

ASSUMED FIRE DURATION

0 hours 29 minutes

CONSEQUENCES OF A FIRE

Due to the fire protection features currently installed, a fire is expected to be rapidly detected and suppressed by either automatic suppression systems or manual fire fighting activities. Fire fighting strategies are available to assist the fire brigade in combating the expected fire hazards. The fire protection features provided for the zone will minimize any potential adverse impact on safe shutdown capability.

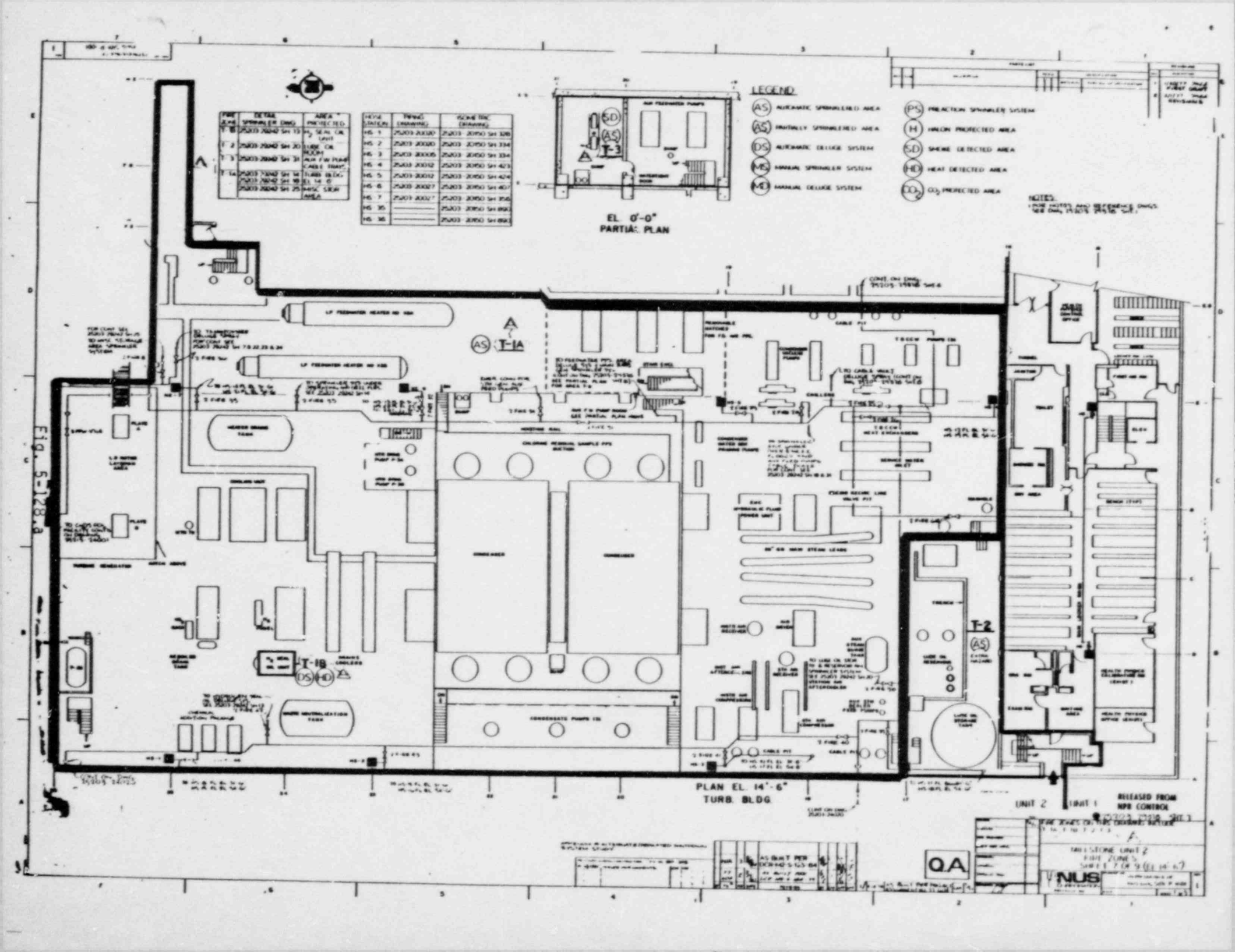
LEGEND
AS AUTOMATIC SPRINKLERED AREA
PS PREACTION SPRINKLER SYSTEM
AS PARTIALLY SPRINKLERED AREA
H HALON PROTECTED AREA
DS AUTOMATIC DELUGE SYSTEM
SD SMOKE DETECTED AREA
MS MANUAL SPRINKLER SYSTEM
HD HEAT DETECTED AREA
MD MANUAL DELUGE SYSTEM
CO_2 CO_2 PROTECTED AREA
EL. 0'-0"
PARTIAL PLAN
PLAN EL. 14'-6"
TURB. BLDG.
T-1A
T-1B
T-2
T-3
UNIT 2
UNIT 1
QA
NUS
RELEASED FROM
NPR CONTROL

Fig. 5-128.a

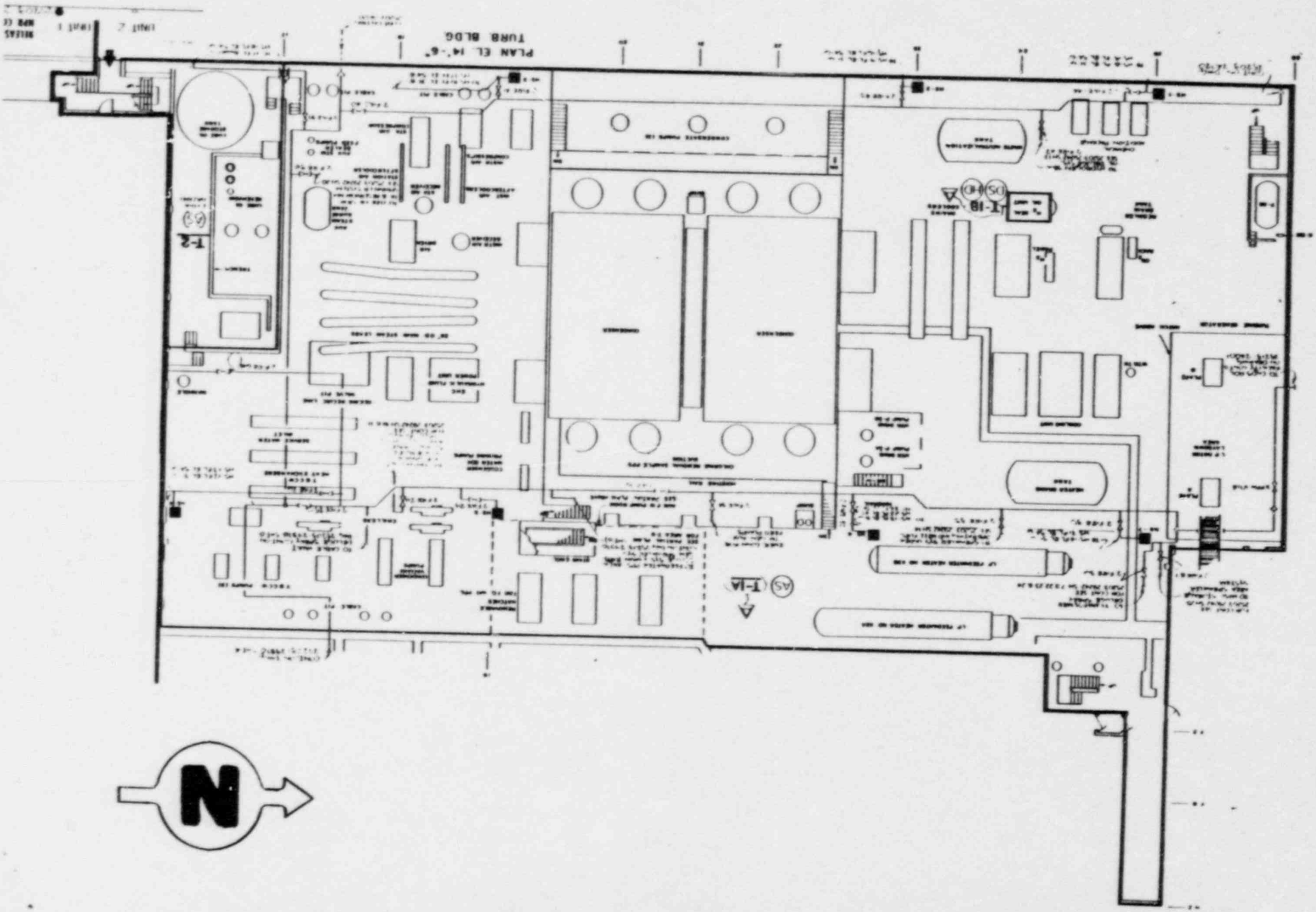

Fig. 5-128.b