Docket No. 50-289 December 12, 1986

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Mr. Henry D. Hukill, Vice President
and Director - TMI-1
GPU Nuclear Corporation
P. O. Box 480
Middletown, Pennsylvania 17057

Dear Mr. Hukill:

SUBJECT: AMENDMENT NO. 122 TO FACILITY OPERATING LICENSE NO. DPR-50

The Commission has issued the enclosed Amendment No. 122 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1). This amendment consists of changes to the Technical Specifications (TSs) in response to your letters dated August 25 and October 1, 1986.

This amendment incorporates specifications for the newly installed Fuel Handling Building (FHB) Engineered Safety Feature (ESF) Air Treatment System, and modifies existing specifications related to the Auxiliary and FHB Air Treatment System. It also includes editorial and administrative changes to improve clarity and adopt test requirements of later standards. Amendment No. 122 provides TS requirements for operability and surveillance of the new FHB ESF Air Treatment System in order to ensure protection against fuel handling accidents of irradiated fuel in the FHB. Concurrently, some TS requirements for the Auxiliary and FHB Air Treatment System have been reduced or deleted, as this system is no longer needed for protecting against FHB accidents. However, those Auxiliary and FHB Air Treatment System specifications necessary to ensure adequate protection against emergency core cooling system (ECCS) leakage (during the design basis accident) and waste decay tank rupture are maintained. Associated TS bases for both systems are also updated to reflect the new and/or revised functional responsibilities of both systems. Furthermore, Section five (Design Features) of the TSs is changed to include the Unit 1 FHB ESF Vent Stack as a gaseous release point.

As discussed in the enclosed Safety Evaluation (SE), your proposal to delete TS 4.12.3.2.d is hereby denied. This monthly surveillance requirement for the Auxiliary and FHB Air Treatment System is retained to ensure system operability for post-accident mitigation of on and off-site dose consequences.

In response to commitments which evolved from the TMI-1 Restart Hearing, you submitted, by letter on March 27, 1986, an engineering design description for a new TMI-1 FHB ESF ventilation system. Further descriptive information, in response to NRC staff questions, regarding the design and operation of this system was also provided by another, separate letter dated October 1, 1986. Additionally, several further staff concerns about FHB ESF ventilation system seismic impact, alteration of physical barriers and interface with the TMI-1 and TMI-2 normal FHB ventilation systems were addressed in your letter dated December 5, 1986. Your letter commits to incorporate certain

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necessary provisions into TMI-1 administrative and refueling procedures, before Cycle 6 fuel handling operations begin, in order to assure optimum FHB ESF Air Treatment System capabilities are maintained. Based upon our review, detailed in the enclosed SE, we conclude the FHB ESF ventilation system design meets the intent of Regulatory Guide 1.52, "Design, Testing and Maintenance Criteria for Post Accident Engineered-Safety-Feature Atmosphere and Cleanup System Air Filtration and Absorption Units of Light-Water-Cooled Nuclear Power Plants". More specifically, the TMI-1 FHB ESF Air Treatment System design is acceptable for the purpose of mitigating offsite radioactive releases resulting from postulated TMI-1 fuel handling accidents.

Notice of Issuance will be included in the Commission's biweekly Federal Register notice. A separate Notice of Denial of Amendment is being forwarded to the Federal Register for publication.

Sincerely,

/s/

Thierry M. Ross, Project Manager
PWR Project Directorate #6
Division of PWR Licensing-B

Enclosures:
1. Amendment No. 122 to DPR-50
2. Safety Evaluation
3. Notice of Denial

cc w/enclosures:
See next page

PBD-6	JOT	JOT for TR	RAW		MKW
RIngram	PBD-6	PBD-6	PBD-6	PBD-6	OGC
	JThoma	TRoss;eh	RWeller	JStolz	MEWagner
12/12/86	12/5/86	12/5/86	12/5/86	12/8/86	12/9/86

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WASHINGTON, D. C. 20555

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 122
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by GPU Nuclear Corporation, et al. (the licensees) dated August 25, 1986, as revised October 1, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

   Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 122, are hereby incorporated in the license. GPU Nuclear Corporation shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days or prior to fuel movement.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B

Attachment:
Changes to the Technical
Specifications

Date of Issuance: December 12, 1986

ATTACHMENT TO LICENSE AMENDMENT NO. 122

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Replace the following pages of the Appendix "A" Technical Specifications with the attached pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change.

Remove	Insert
ii	ii
iv	iv
3-62c	3-62c
3-62d	3-62d
--	3-62e
--	3-62f
3-104	3-104
3-105	3-105
3-105a	3-105a
4-55d	4-55d
4-55e	4-55e
--	4-55f
--	4-55g
4-94	4-94
4-95	4-95
4-106	4-106
4-107	4-107
4-109	4-109
5-10	5-10
Figure 5-3	Figure 5-3

Section	TABLE OF CONTENTS	Page

2	SAFETY LIMITS AND LIMITING SAFETY SYSTEM SETTINGS	2-1
2.1	Safety Limits, Reactor Core	2-1
2.2	Safety Limits, Reactor System Pressure	2-4
2.3	Limiting Safety System Settings, Protection Instrumentation	2-5
3	LIMITING CONDITIONS FOR OPERATION	3-1
3.0	General Action Requirements	3-1
3.1	Reactor Coolant System	3-1a
3.1.1	Operational Components	3-1a
3.1.2	Pressurization, Heatup and Cooldown Limitations	3-3
3.1.3	Minimum Conditions for Criticality	3-6
3.1.4	Reactor Coolant System Activity	3-8
3.1.5	Chemistry	3-10
3.1.6	Leakage	3-12
3.1.7	Moderator Temperature Coefficient of Reactivity	3-16
3.1.8	Single Loop Restrictions	3-17
3.1.9	Low Power Physics Testing Restrictions	3-18
3.1.10	Control Rod Operation	3-18a
3.1.11	Reactor Internal Vent Valves	3-18b
3.1.12	Pressurizer Power Operated Relief Valve (PORV) and Block Valve	3-18c
3.1.13	Reactor Coolant System Vents	3-18f
3.2	Makeup and Purification and Chemical Addition Systems	3-19
3.3	Emergency Core Cooling, Reactor Building Emergency Cooling and Reactor Building Spray Systems	3-21
3.4	Decay Heat Removal Capability	3-25
3.4.1	Reactor Coolant System Temperature Greater Than 250°F	3-25
3.4.2	Reactor Coolant System Temperature 250°F or Less	3-26
3.5	Instrumentation Systems	3-27
3.5.1	Operational Safety Instrumentation	3-27
3.5.2	Control Rod Group and Power Distribution Limits	3-33
3.5.3	Engineered Safeguards Protection System Actuation Setpoints	3-37
3.5.4	Incore Instrumentation	3-38
3.5.5	Accident Monitoring Instrumentation	3-40a
3.6	Reactor Building	3-41
3.7	Unit Electrical Power System	3-42
3.8	Fuel Loading and Refueling	3-44
3.9	Radioactive Materials	3-46
3.10	Miscellaneous Radioactive Materials Sources	3-46
3.11	Handling of Irradiated Fuel	3-55
3.12	Reactor Building Polar Crane	3-57
3.13	Secondary System Activity	3-58
3.14	Flood	3-59
3.14.1	Periodic Inspection of the Dikes Around TMI	3-59
3.14.2	Flood Condition for Placing the Unit in Hot Standby	3-60
3.15	Air Treatment Systems	3-61
3.15.1	Emergency Control Room Air Treatment System	3-61
3.15.2	Reactor Building Purge Air Treatment System	3-62a
3.15.3	Auxiliary & Fuel Handling Building Air Treatment System	3-62c
3.15.4	Fuel Handling Building ESF Air Treatment System	3-62e

Section	TABLE OF CONTENTS	Page

4.7	Reactor Control Rod System Tests	4-48
4.7.1	Control Rod Drive System Functional Tests	4-48
4.7.2.	Control Rod Program Verification	4-50
4.8	Main Steam Isolation Valves	4-51
4.9	Decay Heat Removal Capability - Periodic Testing	4-52
4.9.1	Emergency Feedwater System - Periodic Testing (Reactor Coolant Temperature Greater Than 250°F)	4-52
4.9.2	Decay Heat Removal Capability - Periodic Testing (Reactor Coolant Temperature 250°F or Less)	4-52a
4.10	Reactivity Anomalies	4-53
4.11	Reactor Coolant System Vents	4-54
4.12	Air Treatment Systems	4-55
4.12.1	Emergency Control Room Air Treatment System	4-55
4.12.2	Reactor Building Purge Air Treatment System	4-55b
4.12.3	Auxiliary & Fuel Handling Building Air Treatment System	4-55d
4.12.4	Fuel Handling Building ESF Air Treatment System	4-55f
4.13	Radioactive Materials Sources Surveillance	4-56
4.14	Reactor Building Purge Exhaust System	4-57
4.15	Main Steam System Inservice Inspection	4-58
4.16	Reactor Internals Vent Valves Surveillance	4-59
4.17	Shock Suppressors (Snubbers)	4-60
4.18	Fire Protection Systems	4-72
4.18.1	Fire Protection Instruments	4-72
4.18.2	Fire Suppression Water System	4-73
4.18.3	Deluge/Sprinkler System	4-74
4.18.4	CO_2 System	4-74
4.18.5	Halon Systems	4-75
4.18.6	Hose Stations	4-76
4.19	OTSG Tube Inservice Inspection	4-77
4.19.1	Steam Generator Sample Selection & Inspection Methods	4-77
4.19.2	Steam Generator Tube Sample Selection & Inspection	4-77
4.19.3	Inspection Frequencies	4-79
4.19.4	Acceptance Criteria	4-80
4.19.5	Reports	4-81
4.20	Reactor Building Air Temperature	4-86
4.21.1	Radioactive Liquid Effluent Instrumentation	4-87
4.21.2	Radioactive Gaseous Process & Effluent Monitoring Instrumentation	4-90
4.22.1.1	Liquid Effluents	4-97
4.22.1.2	Dose	4-102
4.22.1.3	Liquid Waste Treatment	4-103
4.22.1.4	Liquid Holdup Tanks	4-104
4.22.2.1	Dose Rate	4-105
4.22.2.2	Dose, Noble Gas	4-110
4.22.2.3	Dose, Radioiodines, Radioactive Material in Particulate Form & Radionuclides Other Than Noble Gases	4-111
4.22.2.4	Gaseous Radwaste Treatment	4-112
4.22.2.5	Explosive Gas Mixture	4-113
4.22.2.6	Gas Storage Tanks	4-114
4.22.3.1	Solid Radioactive Waste	4-115
4.22.4	Total Dose	4-116
4.23.1	Monitoring Program	4-117
4.23.2	Land Use Census	4-121
4.23.3	Interlaboratory Comparison Program	4-122

Amendment No. ~~11~~, ~~28~~, ~~30~~, ~~41~~, ~~47~~, ~~55~~, ~~72~~, ~~78~~, ~~95~~, ~~97~~, ~~119~~, 122

3.15.3 AUXILIARY AND FUEL HANDLING BUILDING AIR TREATMENT SYSTEM

Applicability

Applies to the Auxiliary and Fuel Handling Building Air Treatment System.

Objective

To specify the minimum availability and efficiency for the Auxiliary and Fuel Handling Building Air Treatment System.

Specification

3.15.3.1 The Auxiliary and Fuel Handling Building Air Treatment System including both pairs of exhaust fans (AH-E14A, B, C, and D) and 4 banks of exhaust filters (AH-F2A, B, C, and D) shall be operable at all times during power operation, except as provided in 3.15.3.3 and specified in 3.22.2.4.

3.15.3.2 The Auxiliary and Fuel Handling Building Air Treatment System is operable when its surveillance requirements are met and:

a. The results of the in-place DOP and halogenated hydrocarbon tests at design flows on HEPA filters and charcoal adsorber banks shall show <0.05% DOP penetration and <0.05% halogenated hydrocarbon penetration, except that the DOP test will be conducted with prefilters installed.

b. The results of laboratory carbon sample analysis shall show >90% radioactive methyl iodide decontamination efficiency when tested at 30°C, 95% R.H.

c. Each set of fans AH-E-14 A & C and AH-E-14 B & D shall each be shown to operate within ± 11,881 CFM of design flow (118,810 CFM).

3.15.3.3 a. With one pair of Auxiliary and Fuel Handling Building Air Treatment System exhaust fans (AH-E14A and C or AH-E14B and D) inoperable, verify that the redundant pair of exhaust fans is in operation and discharging through its HEPA filters and charcoal adsorbers within 8 hours, except as provided in 3.15.3.3.b.

b. From the date that the Auxiliary and Fuel Handling Building Air Treatment System becomes inoperable for any reason during power operation, the system (at least one pair of exhaust fans discharging through its HEPA filters and charcoal adsorbers) must be restored to operable condition within 7 days. If the system is not restored to operable within 7 days, prepare and submit a special report to the NRC within the next 30 days outlining the actions taken to restore operability and the plans and schedules for restoring the system to operable status.

Bases

The Auxiliary and Fuel Handling Building Air Treatment System is considered to be the 4 banks of exhaust filters (AH-F2A, B, C, and D) and the two sets of redundant exhaust fans (AH-E-14A and C or AH-E14B and D) which take the exhaust air from both the Auxiliary Building and the Fuel Handling Building and discharge it to the Auxiliary and Fuel Handling Building exhaust stack. Exhaust air passes through all of the exhaust filters (AH-F2A, B, C, and D) prior to being discharged to the stack whenever either set of AH-E14 exhaust fans is in operation.

High efficiency particulate absolute (HEPA) filters are installed before the charcoal adsorbers to prevent clogging of the iodine adsorbers for all emergency air treatment systems. The charcoal adsorbers are installed to reduce the potential release of radioiodine to the environment.

If the efficiencies of the HEPA filters and charcoal adsorbers are as specified, the resulting doses will be less than the 10 CFR 100 guidelines for the accidents analyzed in Chapter 14 of the FSAR, which assumes 90% efficiency. Mitigation of Fuel Handling Accidents is provided by the Fuel Handling Building ESF Air Treatment System and does not depend on the operation of the Auxiliary and Fuel Handling Building Air Treatment System. The Auxiliary and Fuel Handling Building Air Treatment System is isolated by automatic damper actuation in the event of increasing activity in the Fuel Handling Building as sensed by radiation monitors.

References

(1) FSAR Section 9.8
(2) FSAR Figure 9.8-4
(3) FSAR Section 14.2.2.5
(4) FSAR Section 14.2.2.6

3.15.4 FUEL HANDLING BUILDING ESF AIR TREATMENT SYSTEM

Applicability

Applies to the Fuel Handling Building (FHB) ESF Air Treatment System and its associated filters.

Objective

To specify minimum availability and efficiency for the FHB ESF Air Treatment System and its associated filters for irradiated fuel handling operations.

Specifications

3.15.4.1 Prior to fuel movement each refueling outage, two trains shall be operable. One train shall be operating continuously whenever TMI-1 irradiated fuel handling operations in the FHB are in progress.

a. With one train inoperable, irradiated fuel handling operations in the Fuel Handling Building may continue provided the redundant train is operating.

b. With both trains inoperable, handling of irradiated fuel in the Fuel Handling Building shall be suspended until such time that at least one train is operable and operating. Any fuel assembly movement in progress may be completed.

3.15.4.2 A FHB ESF Air Treatment System train is operable when its surveillance requirements are met and:

a. The results of the in-place DOP and halogenated hydrocarbon tests at design flows on HEPA filters and carbon adsorber banks shall show <0.05% DOP penetration and <0.05% halogenated hydrocarbon penetration.

b. The results of laboratory carbon sample analysis shall show ≥90% radioactive methyl iodide decontamination efficiency when tested at 30°C, 95% R.H.

c. The fans AH-E-137A and B shall each be shown to operate within ±10% of design flow (6,000 SCFM).

Bases

Compliance with these specifications satisfies the condition of operation imposed by the Licensing Board as described in NRC's letter dated October 2, 1985, item 1.c.

The FHB ESF Air Treatment System contains, controls, mitigates, monitors and records radiation release resulting from a TMI-1 postulated spent fuel accident in the Fuel Handling Building as described in the FSAR. Offsite doses will be less than the 10 CFR 100 guidelines for accidents analyzed in Chapter 14.

Bases (Cont'd.)

Normal operation of the FHB ESF Air Treatment System will be during TMI-1 irradiated fuel movements in the Fuel Handling Building. The system includes air filtration and exhaust capacity to ensure that any radioactive release to atmosphere will be filtered and monitored. Effluent radiation monitoring and sampling capability are provided.

References

(1) Updated FSAR, Section 14.2.2.1

TABLE 3.21-2 (Continued)

RADIOACTIVE GASEOUS PROCESS AND EFFLUENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE	APPLICABILITY	ACTION
5. Auxiliary and Fuel Handling Building Air Treatment System			
a. Noble Gas Activity Monitor (RM-A8) or (RM-A4 and RM-A6)	1	*	27
b. Iodine Sampler (RM-A8) or (RM-A4 and RM-A6)	1	*	31
c. Particulate Sampler (RM-A8) or (RM-A4 and RM-A6)	1	*	31
d. Effluent System Flow	1	*	26
e. Sampler Flow Rate Monitor	1	*	26
6. Fuel Handling Building ESF Air Treatment System			
a. Noble Gas Activity Monitor (RM-A14 or Suitable Equivalent)	1(2)	****	27, 33
b. Iodine Cartridge	N/A(3)	****	31, 33
c. Particulate Filter	N/A(3)	****	31, 33
d. Effluent System Flow (UR-1104A/B)	1	****	26, 33
e. Sampler Flow Rate Monitor	1	****	26, 33

NOTE 2: Until the beginning of the 7R refueling outage, a suitable equivalent OPERABLE channel may be defined for item 6.a of this specification and specification 4.21.2 (Table 4.21-2, item 6.a) as a system capable of alerting the Control Room by alarm or voice communication and capable of measuring the full range of normal and calculated accident releases for existing plant conditions.

NOTE 3: No instrumentation channel is provided. However, for determining operability, the equipment named must be installed and functional or the ACTION applies.

TABLE 3.21-2
(Continued)

TABLE NOTATION

*At all times
**During waste gas holdup system operation.
***Operability is not required when discharges are positively controlled through the closure of WDG-V47, and RM-A8 and FT-151 are operable.
****During Fuel Handling Building ESF Air Treatment System Operation.

ACTION 25 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, the contents of the tank may be released to the environment for up to 14 days provided that prior to initiating the release:

1. At least two independent samples of the tank's contents are analyzed, and

2. At least two technically qualified members of the Unit staff independently verify the release rate calculations and verify the discharge valve lineup.

3. The Operations and Maintenance Director, Unit 1 shall approve each release.

Otherwise, suspend release of radioactive effluent via this pathway.

ACTION 26 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days provided the flow rate is estimated at least once per 4 hours.

ACTION 27 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days provided grab samples are taken at least once per 8 hours and these samples are analyzed for gross activity within 24 hours. (For RM-A9 only, see also Specification 3.5.1, Table 3.5-1, Item C.3.f).

ACTION 30 1. With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, a grab sample shall be collected and analyzed for the inoperable gas channel(s) at least once per 24 hours. With both channels inoperable, a grab sample shall be collected and analyzed for the inoperable gas channel(s).

(a) at least once per 4 hours during degassing operations.

(b) at least once per 24 hours during other operations (e.g. Feed and Bleed).

TABLE 3.21-2
(Continued)

TABLE NOTATION

ACTION 30 (CONTINUED)

2. If the inoperable gas channel(s) is not restored to service within 14 days, a special report shall be submitted to the Regional Administrator of the NRC Region I Office and a copy to the Director, Office of Inspection and Enforcement within 30 days of declaring the channel(s) inoperable. The report shall describe (a) the cause of the monitor inoperability, (b) action being taken to restore the instrument to service, and (c) action to be taken to prevent recurrence.

ACTION 31 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days, provided that within four hours after the channel has been declared inoperable, samples are continuously collected with auxiliary sampling equipment.

ACTION 32 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 28 days, provided that one OPERABLE channel remains in service or is placed in service within one hour. After 28 days, or if one OPERABLE channel does not remain in service or is not placed in service within one hour, the provisions of 3.0.1 apply.

ACTION 33 With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable channel to OPERABLE status within 7 days, or prepare and submit a special report within 30 days outlining the action(s) taken, the cause of the inoperability, and plans and schedule for restoring the system to OPERABLE status.

Amendment Nos. ~~72~~, ~~103~~, ~~104~~, 122

4.12.3 AUXILIARY AND FUEL HANDLING BUILDING AIR TREATMENT SYSTEM

Applicability

Applies to the Auxiliary and Fuel Handling Building Air Treatment System and associated components.

Objective

To verify that this system and associated components will be able to perform its design function.

Specification

4.12.3.1 At least once per refueling interval:

a. The pressure drop across the combined HEPA filter and adsorber banks shall be demonstrated to be less than 6 inches of water at system design flow rate (±10%).

b. The tests and sample analysis required by Specification 3.15.3.2 shall be performed.

4.12.3.2 Testing necessary to demonstrate operability shall be performed as follows:

a. The tests and sample analysis required by Specification 3.15.3.2 shall be performed following significant painting, steam, fire, or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.

b. DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank or after any structural maintenance on the system housing that could affect the HEPA filter bank bypass leakage.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank or after any structural maintenance on the AH-F2A, B, C, or D housing that could affect charcoal adsorber bank bypass leakage.

d. The fan combination AH-E 14A and C and AH-E 14B and D shall be operated at least 10 hours every month.

4.12.3.3 An air distribution test shall be performed on the HEPA filter bank after any maintenance or testing that could affect the air distribution within the system. The air distribution across the HEPA filter bank shall be uniform within ±20%. The test shall be performed at 118,810 cfm (±10% flow rate).

Amendment Nos. 88, 76, 122

Bases

Pressure drop across the combined HEPA filters and charcoal adsorbers of less than 6 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter. Pressure drop should be determined at least once every refueling interval to show system performance capability.

Tests and sample analysis assure that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedures should allow for the removal of one adsorber tray, emptying of one bed from the tray, mixing the adsorbent thoroughly and obtaining at least two samples. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. The in-place test criteria and laboratory test criteria for activated charcoal will meet the guidelines of ANSI-N510-1980. If test results are unacceptable, all adsorbent in the system should be replaced with an adsorbent qualified according to Regulatory Guide 1.52, March 1978 or ANSI-N509-1980. Any HEPA filters found defective should be replaced with filters qualified according to Regulatory Guide 1.52, March 1978 or ANSI-N509-1980.

If significant painting, steam, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational use. The determination of what is significant shall be made by the TMI-1 Operations & Maintenance Director.

Operation of the Auxiliary and Fuel Handling Building Exhaust Fans each month for at least ten (10) hours will demonstrate operability of the fans.

4.12.4 FUEL HANDLING BUILDING ESF AIR TREATMENT SYSTEM

Applicability

Applies to Fuel Handling Building (FHB) ESF Air Treatment System and associated components.

Objective

To verify that this sytem and associated components will be able to perform its design functions.

Specification

4.12.4.1 Each refueling interval prior to movement of irradiated fuel:

a. The pressure drop across the entire filtration unit shall be demonstrated to be less than 7.0 inches of water at 6,000 cfm flow rate (±10%).

b. The tests and sample analysis required by Specification 3.15.4.2 shall be performed.

4.12.4.2 Testing necessary to demonstrate operability shall be performed as follows:

a. The tests and sample analysis required by Specification 3.15.4.2 shall be performed following significant painting, steam, fire, or chemical release in any ventilation zone communicating with the system that could contaminate the HEPA filters or charcoal adsorbers.

b. DOP testing shall be performed after each complete or partial replacement of a HEPA filter bank, and after any structural maintenance on the system housing that could affect the HEPA filter bank bypass leakage.

c. Halogenated hydrocarbon testing shall be performed after each complete or partial replacement of a charcoal adsorber bank, and after any structural maintenance on the system housing that could affect charcoal adsorber bank bypass leakage.

4.12.4.3 Each filter train shall be operated at least 10 hours every month.

4.12.4.4 An air flow distribution test shall be performed on the HEPA filter bank initially and after any maintenance or testing that could affect the air flow distribution within the system. The distribution across the HEPA filter bank shall be uniform within ±20%. The test shall be performed at 6,000 cfm ± 10% flow rate.

Bases

The FHB ESF Air Treatment System is a system which is normally kept in a "standby" operating status. Tests and sample analysis assure that the HEPA filters and charcoal adsorbers can perform as evaluated. The charcoal adsorber efficiency test procedure should allow for the removal of a sample from one adsorber test cannister. Each sample should be at least two inches in diameter and a length equal to the thickness of the bed. The in-place test criteria and laboratory test criteria for activated charcoal will meet the guidelines of ANSI-N510-1980. If test results are unacceptable, all adsorbent in the system shall be replaced with an adsorbent qualified in accordance with ANSI-N509-1980. Any HEPA filters found defective will be replaced with filters qualified in accordance with ANSI-N509-1980.

Pressure drop across the entire filtration unit of less than 7.0 inches of water at the system design flow rate will indicate that the filters and adsorbers are not clogged by excessive amounts of foreign matter.

Operation of the system for 10 hours every month will demonstrate operability of the filters and adsorber system and remove excessive moisture buildup on the adsorbers and HEPA filters.

If significant painting, steam, fire, or chemical release occurs such that the HEPA filter or charcoal adsorber could become contaminated from the fumes, chemicals or foreign material, the same tests and sample analysis shall be performed as required for operational movement of irradiated fuel . The determination of what is significant shall be made by the TMI-1 Operations & Maintenance Director.

TABLE 4.21-2 (continued)

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	SOURCE CHECK	CHANNEL CALIBRATION	CHANNEL TEST	APPLICABILITY
5. Auxiliary and Fuel Handling Building Air Treatment System					
a. Noble Gas Activity Monitor (RM-A8) or (RM-A4 and RM-A6)	D	M	R(3)	Q(1)	*
b. Iodine Sampler (RM-A8) or (RM-A4 and RM-A6)	W	N/A	N/A	N/A	*
c. Particulate Sampler (RM-A8) or (RM-A4 and RM-A6)	W	N/A	N/A	N/A	*
d. System Effluent Flow Rate Measurement Devices	D	N/A	R	Q	*
e. Sampler Flow Rate Measurement Device	D	N/A	R	Q	*
6. Fuel Handling Building ESF Air Treatment System					
a. Noble Gas Activity Monitor (RM-A14)	D	M	R(3)	Q(2)	****
b. System Effluent Flow Rate (UR-1104 A/B)	D	N/A	R	Q	****
c. Sampler Flow Rate Measurement Device	D	N/A	R	Q	****

TABLE 4.21-2 (Continued)

TABLE NOTATION

* At all times.
** During waste gas holdup system operation.
*** Operability is not required when discharges are positively controlled through the closure of WDG-V47, and RM-A8 and FT-151 are operable.
**** During Fuel Handling Building ESF Air Treatment System Operation.

(1) The CHANNEL TEST shall also demonstrate that automatic isolation of this pathway for the Auxiliary and Fuel Handling Building Air Treatment System, the supply ventilation is isolated and control room alarm annunciation occurs if the following condition exists:

1. Instrument indicates measured levels above the high alarm/trip setpoint. (Includes circuit failure)

2. Instrument indicates a down scale failure. (Alarm function only) (Includes circuit failure)

3. Instrument controls moved from the operate mode. (Alarm function only)

(2) The CHANNEL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exist:

1. Instrument indicates measured levels above the alarm setpoint. (Includes circuit failure)

2. Instrument indicates a down scale failure (Includes circuit failure)

3. Instrument controls moved from the operate mode.

(3) The initial CHANNEL CALIBRATION for radioactivity measurement instrumentation shall be performed using one or more of the reference standards certified by the National Bureau of Standards or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards should permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration should be used. (Operating plants may substitute previously established calibration procedures for this requirement.)

(4) The CHANNEL CALIBRATION shall include the use of standard gas samples containing a nominal:

1. One volume percent hydrogen, balance nitrogen, and

2. Four volume percent hydrogen, balance nitrogen.

TABLE 4.22-2

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml)[a]
A. Waste Gas Storage Tank	P Each Tank Grab Sample	P Each Tank	Principal Gamma Emitters [g]	1×10^{-4}
B. Containment Purge	P Each Purge [b] Grab Sample	P Each Purge [b]	H-3 Principal Gamma Emitters [g]	1×10^{-6} 1×10^{-4}
C. Auxiliary and Fuel Handling Building Air Treatment System	M[c,e] Grab Sample	M	H-3 Principal Gamma Emitters [g]	1×10^{-6} 1×10^{-4}
D. Fuel Handling Building ESF Air Treatment System	M (during system operation) Grab Sample	M (during system operation)	H-3 Principal Gamma Emitters [g]	1×10^{-6} 1×10^{-4}
E. Condenser Vacuum Pumps Exhaust [h]	M[b,h] Grab Sample	M[b,h]	H-3 Principal Gamma Emitters [g]	1×10^{-6} 1×10^{-4}

TABLE 4.22-2 (Continued)

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

Gaseous Release Type	Sampling Frequency	Minimum Analysis Frequency	Type of Activity Analysis	Lower Limit of Detection (LLD) (uCi/ml) [a]
F. All Release Types as Listed Above in A, B, C and D (during System Operation)	Continuous [f]	W[d] Charcoal Sample	I-131 I-133	1×10^{-12} 1×10^{-10}
	Continuous [f]	W[d] Particulate	Principle Gamma Emitters [g] (I-131, Others)	1×10^{-11}
	Continuous [f,i]	Q Composite Particulate Sample	Gross Alpha	1×10^{-11}
	Continuous [f,i]	Q Composite Particulate Sample	Sr-89, Sr-90	1×10^{-11}

TABLE 4.22-2 (Continued)

d. Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing (or after removal from sampler).

e. Tritium grab samples shall be taken weekly from the ventilation exhaust from the spent fuel pool area whenever spent fuel is in the spent fuel pool.

f. The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Specifications 3.22.2.1, 3.22.2.2, and 3.22.2.3.

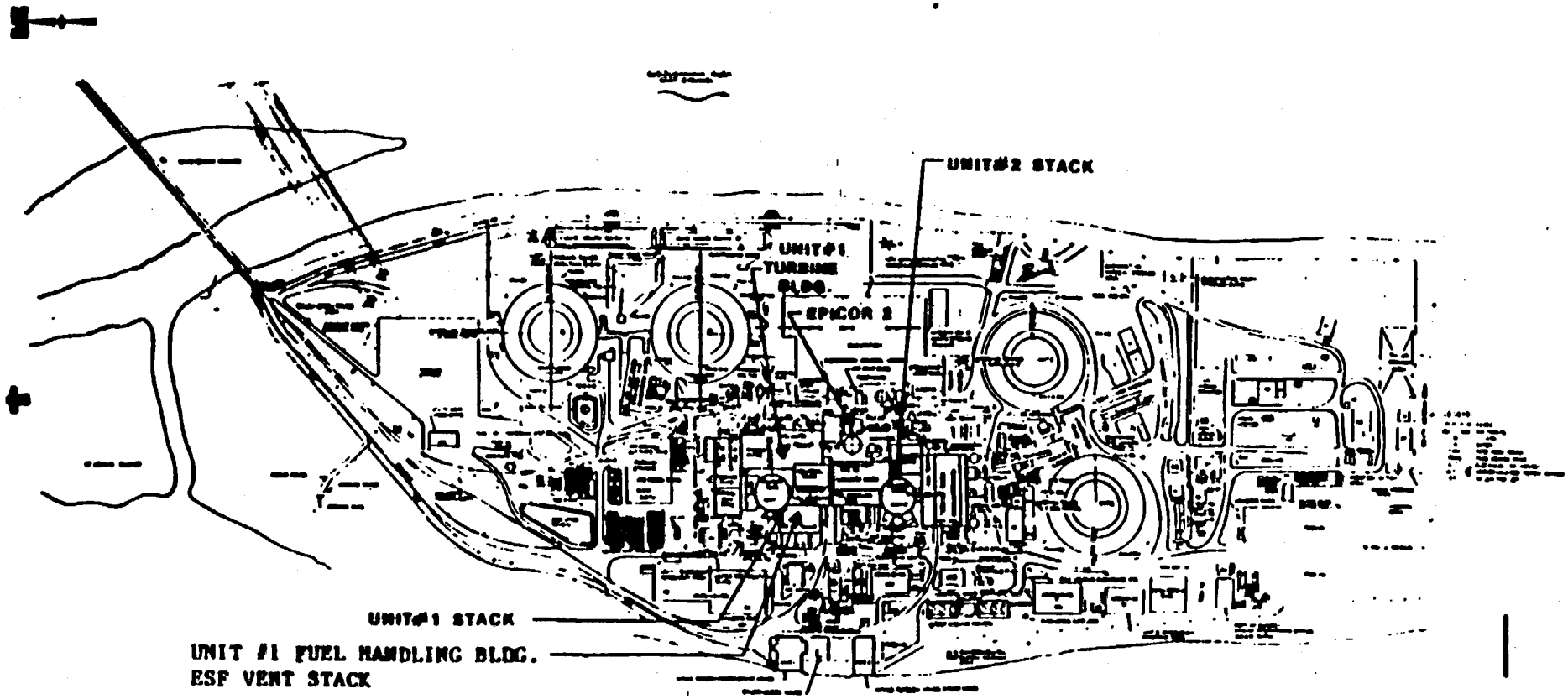
g. The principal gamma emitters for which the LLD specification applies exclusively are the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135 and Xe-138 for gaseous emmissions and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-137, Ce-141 and Ce-144 for particulate emissions. This list does not mean that only these nuclides are to be detected and reported. Other peaks which are measurable and identifiable, together with the above nuclides, shall also be identified and reported. Nuclides which are below the LLD for the analyses shall be reported as "less than" the nuclide's LLD, and shall not be reported as being present at the LLD level for that nuclide. The "less than" values shall not be used in the required dose calculations.

h. Applicable only when condenser vacuum is established. Sampling and analyses shall be performed within 4 hours following each shutdown, startup or thermal power level change exceeding 15% of Rated Thermal Power in one hour.

i. Gross Alpha, Sr-89, and Sr-90 analyses do not apply to the Fuel Handling Building ESF Air Treatment System.

ELEVATIONS FOR GASEOUS EFFLUENT RELEASE POINTS

Unit 1 Stack	483' 7"
Unit 1 Turbine Building	425' 4"
Unit 2 Stack	483' 0"
Epicor II	359' 6"
Unit 1 Fuel Handling Building ESF Vent Stack	348'



Site Boundary for Gaseous Effluents

Figure 5-3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 122 TO FACILITY OPERATING LICENSE NO. DPR-50

METROPOLITAN EDISON COMPANY
JERSEY CENTRAL POWER AND LIGHT COMPANY
PENNSYLVANIA ELECTRIC COMPANY
GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

1.0 BACKGROUND

In a letter dated March 27, 1986, GPU Nuclear Corporation (GPUN or the licensee) submitted a description of their engineering design for a new Fuel Handling Building (FHB) Engineered-Safety-Feature (ESF) ventilation system in response to a commitment in the TMI Restart Hearing Partial Initial Decision (PID), Section III.B, paragraph 1265, Vol. I, dated December 14, 1981, and in the GPUN Letter 5211-83-103, R.C. Arnold to J.F. Stolz "Engineered-Safety-Feature (ESF) Filter System" dated March 31, 1983. Further descriptive information regarding the design and operation of the TMI-1 FHB ESF ventilation system and related aspects of the TMI-2 FHB ventilation system was provided by the licensee in their letter dated October 1, 1986. By letter dated August 25, 1986, the licensee also submitted Technical Specification Change Request (TSCR) No. 156 in order to comply with the condition of operation imposed by the Licensing Board as described in the NRC letter dated October 2, 1985 (Item 1.C). Subsequently, TSCR No. 156, Revision 1, was submitted by another letter dated October 1, 1986, to address NRC staff comments generated during review of the original TSCR 156. This letter also revised two previous commitments contained in the March 27, 1986 submittal.

Item 1.C of the NRC's October 2, 1985 letter states that: "After the restart of Unit 1 and prior to any movement within the Unit 1 fuel handling building of any irradiated Unit 1 fuel, GPU Nuclear Corporation shall install, and have operable, an engineered safety feature (ESF) filtration system for the Unit 1 fuel handling building. The ESF filtration system for Unit 1 shall be operable whenever irradiated Unit 1 fuel is moved within the Unit 1 fuel handling building." This item in the NRC letter was based on the aforementioned PID which states: "Prior to the first refueling outage, licensee will upgrade the system to include a new ESF filter system meeting the guidelines of Regulatory Guide (RG) 1.52, "Design, Testing, and Maintenance Criteria for Post-Accident ESF Atmosphere Cleanup System Air Filtration and Adsorption Units of Light-Water-Cooled Nuclear Power Plants, (Revision 2, March 1978)"; and ...the purpose of the ESF filter system is...to protect against Unit 1 fuel handling accidents."

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2.0 INTRODUCTION

The FHB ESF Air Treatment System (i.e., FHB ESF ventilation system) is being installed to contain, confine, control, mitigate, monitor and record the radiation release resulting from a TMI-1 postulated spent fuel accident in the FHB as described in Final Safety Analysis Report (FSAR), Section 14.2.2.1, Update 4, 7/85. In general terms, the licensee has stated, "The functions of the FHB ESF Ventilation System are as follows:

1. Reduce the possibility of airborne radioactive releases to the environment by discharging the fuel handling floor exhaust air through a filtered, monitored, and controlled path.

2. Serve as a means of collecting the radioactive release and processing the radioactive iodine and particulates from the postulated fuel handing accident to levels acceptable for the release to the environment."

To comply with GPUN commitments, the TMI-1 FHB ESF Air Treatment System is required to be operable and operating whenever irradiated fuel is being moved within the FHB to protect against a fuel handling accident. Design, construction, operation, and testing of this new system in accordance with RG 1.52, Revision 2, 1978, were reviewed by the NRC staff.

Operability and surveillance requirements of TSCR 156 and Revision 1 were examined by the NRC staff. These requests provided specifications for the new FHB ESF Air Treatment System and modified the specifications for the existing Auxiliary and Fuel Handling Exhaust Air Treatment System. In addition, editorial and administrative TS changes were made to improve clarity and adopt later testing standards. Furthermore, appropriate TS bases and design features were also updated. In both requests, the name Auxiliary and Fuel Handling Exhaust Air Treatment System was replaced by the name Auxiliary and FHB Air Treatment System. For clarity, the latter name will be used in this evaluation.

The Auxiliary and FHB Air Treatment System is required to be operable at all times during power operation for accident mitigation as described in FSAR Chapter 14 and in order to ensure that doses to radiation workers and releases to offsite during power operation are filtered and maintained As Low As Reasonably Achievable (ALARA). With the addition of the new ESF ventilation system, the Auxiliary and FHB Air Treatment System will not be required to mitigate the offsite dose consequences of a fuel handling accident in the FHB.

3.0 EVALUATION

A. FHB ESF Air Treatment System Design

In this review, the NRC staff focused primarily on design of the TMI-1 FHB ESF ventilation system in accordance with the guidelines of RG 1.52, as prescribed by the PID. However, for review purposes, RG 1.52 does also reference RG 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low As Is

Reasonably Achievable," and other standards for use in design and testing of ESF atmosphere cleanup systems (e.g., ANSI N509-1976 "Nuclear Power Plant Air Cleaning Units and Components" and ANSI N510-1975 "Testing of Nuclear Air Cleaning Systems"). It should be noted, Standard Review Plan (SRP) Section 6.5.1, "ESF Atmosphere Cleanup Systems", Rev. 2, July 1981, has referenced the more recent revisions of the air cleaning standards than RG 1.52. Consequently, we have also accepted in our evaluation any appropriate references to ANSI-N509-1980 and ANSI-N510-1980, instead of ANSI-N509-1976 and ANSI-N510-1975.

RG 1.52 does not address the acceptability of ESF atmosphere cleanup systems with regard to the radiological consequences of postulated fuel handling accidents. Therefore, the NRC staff used the following acceptance criterion from SRP Section 15.7.4, "Radiological Consequences of Fuel Handling Accidents," Rev. 1, July, 1981, to evaluate the design of the FHB ESF ventilation system filter system:

> "The plant site and dose mitigating ESF systems are acceptable with respect to the radiological consequences of a postulated fuel handling accident if the calculated whole-body and thyroid doses at the exclusion area and low population zone boundaries are well within the exposure guideline values of 10 CFR Part 100, paragraph 11. 'Well within' means 25 percent or less of the 10 CFR Part 100 exposure guideline values, i.e., 75 rem for the thyroid and 6 rem for the whole-body doses."

The NRC staff did not review the FHB ESF ventilation system against the acceptance criteria of SRP Section 6.5.1 or SRP Section 9.4.2, "Spent Fuel Pool Area Ventilation System" since the PID referred only to the guidelines of RG 1.52.

In their March 27, 1986 letter, GPUN stated that "the FHB ESF ventilation system shall be designed in accordance with RG 1.52 and applicable sections of RG 8.8 using the guidelines of SRP Sections 6.5.1, 9.4.2 and 15.7.4. Specific design features shall be as identified in ANSI/ASME N509." The NRC staff has reviewed all applicable information submitted by the licensee and concludes that the design of the TMI-1 FHB ESF Air Treatment System meets the intent of the RG 1.52 guidelines. Specific aspects which warrant further detailed explanation are described below.

Section C.2.a of RG 1.52 recommends ESF atmosphere cleanup systems should be provided with demisters. In response, the licensee has stated that the ESF filter units are not provided with demisters because the presence of saturated steam or water droplets is not anticipated in the air stream during a fuel handling accident. The NRC staff agrees and concludes this design meets the intent of the RG 1.52 guidelines.

Section C.2.b of RG 1.52 recommends that the generation of missiles from high pressure equipment rupture and natural phenomena should be considered in the design of ESF atmosphere cleanup systems. In response, the licensee has stated there is no high energy pipe near the ESF filter system.

Furthermore, natural phenomena were addressed by procedural requirements which halt all fuel movement activity in the event of a hurricane or tornado warning. Therefore, no additional protection for high energy rupture and natural phenomena is needed. The NRC staff finds that high pressure missiles and natural phenomena have been adequately considered and concludes this design meets the intent of the RG 1.52 guidelines.

Section C.2.c of RG 1.52 recommends all components of an ESF atmosphere cleanup system should be designated Seismic Category I if failure of a component would lead to the release of significant quantities of fission products to working or outdoor environments. In response, the licensee stated that components of the ESF ventilation system and their enclosure are not required to be seismically qualified since their failure during a design basis seismic event would result in onsite and offsite doses below those of the criteria of SRP Section 15.7.4. This is based upon the TMI-1 FSAR design basis fuel handling accident of 56 damaged fuel rods. The NRC staff performed independent analyses of the dose consequences of this accident assuming failure of the FHB ESF Air Treatment System. In these analyses, the staff used the guidelines of RG 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handing and Storage Facility for Boiling and Pressurized Water Reactors," as referenced in SRP Section 15.7.4. In addition to the offsite dose consequences, the staff calculated doses to personnel in the TMI-1 and TMI-2 control rooms, assuming failure of the FHB ESF ventilation system during the design basis fuel handling accident. SRP Section 6.4, "Control Room Habitability System," provides doses to an individual in the control room that should not be exceeded for a postulated accident. The NRC staff concludes, based on these analyses, that the calculated doses to personnel in the TMI-1 and TMI-2 control rooms, and at the exclusion area boundary, for the design basis fuel handling accident without a functional ESF atmosphere cleanup system are below those of the acceptance criteria of SRP Sections 6.4 and 15.7.4 respectively. Thus, the corresponding releases of fission products to working and outdoor environments are not significant. Therefore, the NRC staff finds that a non-seismically qualified FHB ESF ventilation system design meets the intent of the RG 1.52 guidelines.

Section C.2.d of RG 1.52 recommends ESF filter systems should be protected from pressure surges resulting from postulated accidents. In response, the licensee has stated there are no pressure surges associated with the design basis fuel handling accident, therefore, protection from pressure surges is not provided. The NRC staff agrees and concludes this design meets the intent of RG 1.52.

Section C.2.g of RG 1.52 recommends ESF atmosphere cleanup systems should be instrumented to signal, alarm, and record pertinent pressure drops and flow rates in the control room. In response, the licensee stated that the ESF Ventilation System shall be operated continuously during fuel handling operations. The system will be provided with minimum instrumentation for local readout and alarm, and for readout and alarm at a remote manned control panel, as indicated in ANSI-N509-1980. Critical operating parameters shall be alarmed, indicated, and recorded at remote locations

(remote from the system filter components), which will only be manned (as required by plant procedure) if a fuel handling accident has occurred. Fuel handling accident indication by the Effluent Radiation Monitor shall be alarmed, indicated, and recorded in the Control Room. The NRC staff concludes the instrumentation design and provisions meet the intent of RG 1.52 guidelines.

Section C.2.h of RG 1.52 recommends the following:

> The power supply and electrical distribution system for ESF atmosphere cleanup systems should be designed in accordance with RG 1.32. All instrumentation and equipment controls should be designed to IEEE Standard 279. The systems should be qualified and tested under RG 1.89. To the extent practicable, RGs 1.30, 1.100 and 1.118, and IEEE Standard 334 should be considered in the design.

In response, the licensee has stated the electrical power and control system for the ESF ventilation system design complies with RG 1.52 provisions, including a reliable electrical power supply for effluent radiation monitoring capability. Redundant Class 1E power circuits for each ESF fan and filter preheater, as well as instrumentation circuits, also meet RG 1.52 requirements where applicable. However, due to bus loading limitations, the FHB ESF Air Treatment System will not be operated whenever one of the station auxiliary transformers (or 4160 V ESF bus) is out of service while Unit 1 is operating. During such conditions there will be no irradiated fuel movement. This restriction does not apply when Unit 1 is shutdown. In the event of a loss of offsite power, the capability to manually load the ESF ventilation system onto the diesel is provided. The NRC staff concludes the licensee's power and control system design meets the intent of RG 1.52 guidelines.

Section C.5.c of RG 1.52 recommends that HEPA filter sections should be leak tested in place at least once per 18 months; Section C.5.d recommends the activated carbon adsorber section should be leak tested at least once per 18 months; and Section C.6.a(3) recommends representative samples of used activated carbon should pass the laboratory tests given in Table 2 (of RG 1.52) at least once per 18 months for systems maintained in a standby status or after 720 hours of system operation. In response, the licensee has stated the expected service life of filters in the FHB ESF ventilation system is comparable to a standby system, and requiring testing at least once per refueling interval, rather than at least once per 18 months is justified. The NRC staff concludes that performing the above tests for TMI-1 ESF ventilation system filters at least once per refueling outage meets the intent of RG 1.52 (see the TS discussion on this same subject for more detail).

Section C.6.b of RG 1.52 recommends that representative samples of used ESF filter system activated carbon should pass the laboratory tests given in Table 2 of the RG. In response, the licensee has proposed a laboratory acceptance criterion of 90% minimum removal efficiency for methyl iodide by the ESF filter system carbon adsorbers. This is consistent with requirements for laboratory testing of carbon adsorbers for other atmosphere cleanup systems at TMI-1. The NRC staff concludes this acceptance criterion meets the intent of RG 1.52.

The NRC staff evaluated acceptability of the FHB ESF filter system with regard to the radiological consequences of postulated fuel handling accidents in accordance with the previously cited acceptance criterion of SRP Section 15.7.4. The licensee has maintained that, in accordance with the FSAR, the design basis accident consists of only 56 damaged fuel rods. However, the FHB ESF Air Treatment System has the capability to adequately monitor and mitigate the consequences of effluent resulting from a 208 rod accident, using RG 1.25 guidelines. We performed an independent analysis of the dose consequences of this accident using RG 1.25 guidelines as referenced in SRP Section 15.7.4. Based on this analysis, dose consequences are within the acceptance criterion. Therefore, the NRC staff concludes FHB ESF Air Treatment System filter system design capacity for removal of fission products from exhaust air is acceptable.

The licensee has stated the FHB ESF Air Treatment System shall include adequate air filtration and exhaust capacity to ensure that no uncontrolled radioactive release to the atmosphere occurs. RG 1.52 contains no statement regarding testing to demonstrate that ESF atmosphere cleanup systems are capable of maintaining a negative pressure in specified critical plant areas to ensure no uncontrolled radioactive releases to the atmosphere occur. Proposed TSs by the licensee (August 25 and October 1, 1986) for the FHB ESF ventilation system likewise contain no requirement for such testing. However, another GPUN letter of October 1, 1986 did propose a one time post-installation start-up test to demonstrate system capability of drawing a negative pressure in the fuel handling area. Furthermore, the licensee has committed to put procedures in place (before fuel handling operations commence) that preclude any significant or unevaluated changes in the arrangement of physical barriers relied upon by the FHB ESF ventilation system design (which were in place during initial verification testing of the system) to control releases of radioactive material during a fuel handling accident. The NRC staff concludes, based upon satisfactory implementation of startup testing and procedure commitments, that this aspect of the FHB ESF ventilation system meets the intent of RG 1.52.

The NRC staff determined from its review that prompt isolation of both the TMI-1 and the TMI-2 normal FHB ventilation systems and the prompt closure of the railway access door common to the FHBs, following an accident signal in the TMI-1 FHB, are required in order for the TMI-1 FHB ESF ventilation system to perform its intended function. The licensee has committed to impose procedures prior to Cycle 6 refueling which will require: 1) maintaining the railway access door closed during irradiated fuel handling operations, and 2) implementing prompt isolation of both TMI-1 and TMI-2 normal FHB ventilation systems following fuel handling accident indication in the TMI-1 FHB. The NRC staff considers these procedural instructions will be acceptable to address FHB isolation.

The Commonwealth of Pennsylvania and the NRC staff had some questions concerning the seismic capability of the roof supporting the new ESF ventilation system. These concerns are addressed herein. GPUN has evaluated the adequacy of the Auxiliary Building structure for the additional loadings resulting from components of the FHB ESF ventilation system. The licensee has indicated that the total added weight on top of the auxiliary building roof due to the FHB ESF ventilation system, and supporting concrete pad, is 216,000 pounds. Original weight of the roof used in the mathematic model for the auxiliary building seismic analysis was 43,871,000 pounds. Therefore, the added weight represents only 0.49% of the original weight. The NRC staff concurs with the licensee's evaluation that the effect of this additional weight is negligible with respect to seismic response. The NRC staff also concurs the effect of this additional weight is negligible with respect to the local supporting strength of the roof because the roof was designed for a concentrated load of 17,000,000 pounds. Based on the above, the NRC staff concludes the Auxiliary Building structure is adequate to support additional loadings resulting from the components of the FHB ESF Air Treatment System.

In summary, the NRC staff concludes that the design of the TMI-1 FHB ESF Air Treatment System, described in the aforementioned GPUN submittals, meets the intent of RG 1.52 for ESF filter systems designed to control radioactive releases and protect against unacceptable offsite doses following a FHB accident. Therefore, this system is acceptable provided the previously detailed procedural commitments are properly implemented (see also the following TS evaluation summary).

B. FHB ESF Air Treatment and Auxiliary and FHB Air Treatment Systems Technical Specifications (TSCR 156 & Revision 1)

The NRC staff reviewed the proposed addition of TS 3.15.4 and 4.12.4 (including bases) for operation and surveillance of the new FHB ESF Air Treatment System primarily for conformance with the guidelines of RG 1.52 as specified in the PID. Proposed changes to TS 3.15.3 and 4.12.3 (including bases) were reviewed for the existing Auxiliary and FHB Air Treatment System with respect to this system's reduced accident mitigation responsibility. Other TSCR 156 (Revision 1) changes to incorporate the new FHB ESF Air Treatment System in Section five ("Design Features"), Tables 3.21-2 and 4.21-2 ("Radioactive Gaseous Process and Effluent Monitoring Instrumentation" operability and surveillance requirements), and Table 4.22-2 ("Radioactive Gaseous Waste Sampling and Analysis Program") were also reviewed. Furthermore, additional editorial and administrative changes or corrections affecting the TSs to improve clarity, reflect newer standards, or delete inapplicable notes have been examined by the NRC staff.

Mitigation of a fuel handling accident (in the FHB) is now to be provided by the new FHB ESF Air Treatment System and will no longer depend on the operation of the Auxiliary and FHB Air Treatment System. However, in the proposed changes to the TS for the Auxiliary and FHB Air Treatment System, references to FSAR Sections 14.2.2.5 and 14.2.2.6 were added which describe the role of this system in mitigating the consequences of, respectively, engineered safeguards leakage external to the reactor building during the

recirculation phase for long-term core cooling following the maximum hypothetical accident, and the rupture of a waste gas tank. Therefore, the staff review considered the proposed TS changes for the Auxiliary and FHB Air Treatment System in accordance with its continuing role for mitigation of offsite dose consequences for the above postulated accidents.

The NRC staff has reviewed the proposed TS changes and safety analyses submitted by the licensee and finds the proposed changes and supporting rationale to be generally acceptable. Those specific aspects which warrant further detailed explanation are described below.

Section C.2.a of RG 1.52, recommends ESF atmosphere cleanup systems designed and installed for the purpose of mitigating accident doses should be redundant. Proposed TS 3.15.4 (FHB ESF Air Treatment System) would require both trains of the system to be operable (prior to fuel movement) for each refueling outage, with one train operating continuously whenever irradiated fuel handling operations in the FHB are in progress. With only one train operable and operating, fuel handling operations could still continue; but, with both trains inoperable, fuel handling operations could not continue except to complete any fuel assembly movement in progress. However, no limit is specified on the period of time during which fuel handling operations are allowed to continue with only one train operable and operating. In order to evaluate this proposal, the NRC staff performed an independent analysis of the dose consequences of the design basis fuel handling accident (56 damaged fuel rods), assuming the complete failure of the new FHB ESF Air Treatment System. In this analysis, the staff used the guidelines of RG 1.25, as referenced in SRP Section 15.7.4. Based on this analysis, the staff determined that the calculated doses to personnel in the TMI-1 and TMI-2 control rooms and at the exclusion area boundary are below those of the acceptance criteria of SRP Sections 6.4 and 15.7.4, respectively. Therefore, the NRC staff concludes TS 3.15.4 is acceptable. Fuel handling operations, once started, can continue indefinitely with only one train of FHB ESF Air Treatment System operable and operating. That is until the next refueling outage, when both trains are again required to be operable (prior to fuel movement).

Section C.4.d of RG 1.52 recommends that each ESF atmosphere cleanup train should be operated at least 10 hours per month, with the heaters on (if so equipped), to reduce the buildup of moisture on the adsorbers and HEPA filters. Proposed TS 4.12.4.3 for the FHB ESF Air Treatment System contains this requirement and is, therefore, acceptable. However, in the licensee's proposal, TS 4.12.3.2.d for the Auxiliary and FHB Air Treatment System, which contained this requirement, was deleted on the basis that the Auxiliary and FHB Air Treatment System is not (now) required to meet RG 1.52. Contrary to this, as described previously, the Auxiliary and FHB Air Treatment System continues to perform a post-accident function for mitigation of offsite dose consequences. Therefore, this change to TS 4.12.3.2.d is not acceptable, and the 10 hours per month testing requirement has been retained.

Section C.5.c of RG 1.52 recommends that HEPA filter sections should be leak-tested inplace at least once per 18 months. Section C.5.d recommends that the activated carbon adsorber section should be leak-tested at least once per 18 months, and section C.6.a(3) recommends that

representative samples of used activated carbon should pass the laboratory tests given in Table 2 (of the RG), which indicates that tests should be performed at least once per 18 months for systems maintained in a standby status or after 720 hours of system operation. ERDA 76-21, "Nuclear Air Cleaning Handbook", referred to in ANSI N509-1980 and ANSI N510-1980 states that regular in-place testing of standby systems is necessary because deterioration (and leaks) can take place even when systems are not being operated. Further, because of the uncertain life of activated carbon under normal operating conditions, ERDA 76-21 indicates that the NRC recommends adsorbent samples from ESF systems be taken for laboratory testing every 720 hours of fan operation, and for standby systems, at least once per 18 months. However, proposed TS 4.12.3 for the Auxiliary and FHB Air Treatment System and TS 4.12.4 for the FHB ESF Air Treatment System require the above test at least once per refueling outage, rather than at least once per 18 months. These TSs represent a revision in the commitment contained within the GPUN submittal of March 27, 1986. In response, the licensee has stated the expected service time of the FHB ESF Ventilation System filter system approaches that of a standby system. Therefore, requiring the HEPA filter and carbon adsorber leak testing and carbon laboratory testing at least once per refueling interval rather than at least once per 18 months is justified since, under current circumstances, this would not result in less frequent testing. Furthermore, actual results of GPUN operational experience with the TMI-1 Auxiliary and FHB Air Treatment System have demonstrated that very little degradation of the system filter's methyl iodide removal efficiency has resulted even after approximately five years of continuous use. Based on the above, the NRC staff finds that performing the above tests for the Auxiliary and FHB Air Treatment System and the FHB ESF Air Treatment System at least once per refueling outage meets the intent of RG 1.52, and, therefore, this aspect of proposed TS 4.12.3 and 4.12.4 is acceptable.

Section C.6.b of RG 1.52 recommends that representative samples of used ESF filter system activated carbon should pass the laboratory tests given in Table 2 of the RG. Proposed TS 3.15.3.2.b for the Auxiliary and FHB Air Treatment System and TS 3.15.4.2.b for the FHB ESF Air Treatment System require that the results of laboratory carbon sample analysis show greater than 90% radioactive methyl iodide decontamination efficiency when tested at 30°C, 95% relative humidity. This is consistent with requirements for laboratory testing of carbon adsorbers for other atmosphere cleanup systems at TMI-1. The NRC staff finds that this requirement meets the intent of RG 1.52 and is, therefore, acceptable.

Proposed TS 4.12.4 for the FHB ESF Air Treatment System includes requirements to operate each train for at least 10 hours each month, but does not require the system to be operated for two hours prior to movement of irradiated fuel as was discussed in the licensee's March 27, 1986 submittal. This constitutes a revision of a previous written statement. However, RG 1.52, Revision 2 of 1978, does not require the system to operate for two hours before declaring the system operable. Therefore, the NRC staff concludes this change in commitments does not represent an exception to RG 1.52 and is acceptable for the TSs.

TSCR 156 and Revision 1 did not propose any requirements in Table 4.22-2 for quarterly composite sampling and analysis of gross alpha, Sr-89, and Sr-90 from the FHB ESF Air Treatment System exhaust. Attachment 2, of the GPUN letter dated October 1, 1986 ("Responding to NRC questions on the TMI-1 FHB ESF Ventilation System") provided justification for not routinely analyzing FHB ESF Air Treatment System effluents for gross alpha, SR-89, and SR-90. The reasons given were that this ventilation system will not be operated continuously during TMI-1 operation; and even for those specific periods when it is, the majority of FHB ventilation flow will be through the Auxiliary and FHB Air Treatment System to the Unit 1 stack, which is sampled and analyzed quarterly for the radionuclides of concern. Furthermore, the licensee had not detected any significant levels of these radionuclides during Cycle 5 continuous composite sampling. Thus, the NRC staff concludes the TS for continuous composite sampling and routine analysis of gross alpha, Sr-89, and Sr-90 at the FHB ESF Air Treatment System exhaust are not warranted. However, the licensee should be sensitive to any indicators from their sampling program that suggest the significance of these radionuclides has changed, at which time additional analysis may be necessary.

RG 1.52 contains no guidelines regarding testing to demonstrate that ESF atmosphere cleanup systems are capable of maintaining negative pressures in specified critical plant areas to ensure that uncontrolled radioactive releases to the atmosphere will not occur. The existing TMI-1 TSs for the Auxiliary and FHB Air Treatment System, which were relied on to mitigate the consequences of a fuel handling accident in the FHB, contain no requirement for such testing. TSCR 156 and Revision 1 for the FHB ESF Air Treatment System and the Auxiliary and FHB Air Treatment System likewise contain no requirements for such testing. The proposed TSs for these systems just require periodic air distribution tests at specified design air flow rates. The licensee, however, has committed to establish procedures, before commencing fuel handling operations, that will preclude significant or unevaluated changes from being made to the physical barriers relied upon by the FHB ESF Air Treatment System design and initial start-up test. Therefore, the system's ability to maintain a negative pressure in the FHB will not be compromised due to relocation of barriers, which could result in uncontrolled release of radioactive materials during a fuel handling accident. Based on the above, the NRC staff concludes that this aspect of the proposed TSs for the FHB ESF Air Treatment System meets the intent of RG 1.52 and is, therefore, acceptable. Furthermore, the proposed TS amendments ensure a level of safety which is no less than that provided by the existing TSs and, therefore, are acceptable.

In summary, the NRC staff concludes, based on the review and evaluation detailed above, that proposed changes to TS 3.15.3, 3.15.4, 4.12.3, and 4.12.4; Tables 3.21-2, 4.21-2, and 4.22-2; Figures 5-3; and pages ii, iv, and 5-10 meet the intent of RG 1.52 and are acceptable. However, deletion of TS 4.12.3.2.d is denied and the following additional considerations apply to the new ESF FHB ventilation system (per GPUN commitments identified in letter dated December 5, 1986):

1. Pertinent procedures shall be implemented prior to fuel movement to preclude significant or unevaluated changes in physical barriers relied upon by system design and initial startup test, and

2. Pertinent procedures shall be in place prior to fuel movement which maintain the rail way access door closed during fuel handling, and assure prompt isolation of TMI-1 and TMI-2 normal FHB ventilation during a FHB accident.

ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and in surveillance requirements. We have determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

CONCLUSION

We have concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Dated: December 12, 1986

Principal Contributor:
C. Nichols

7590-01

UNITED STATES NUCLEAR REGULATORY COMMISSION

METROPOLITAN EDISON COMPANY

JERSEY CENTRAL POWER AND LIGHT COMPANY

PENNSYLVANIA ELECTRIC COMPANY

GPU NUCLEAR CORPORATION

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

DOCKET NO. 50-289

NOTICE OF DENIAL OF AMENDMENT TO FACILITY OPERATING LICENSE

AND OPPORTUNITY FOR HEARING

The U.S. Nuclear Regulatory Commission (the Commission) has denied in part, a request by GPU Nuclear Corporation, et al. (the licensees) for an amendment to Facility Operating License No. DPR-50 issued to GPU Nuclear Corporation, et al. for operation of the Three Mile Island Nuclear Station, Unit No. 1 (TMI-1) located in Dauphin County, Pennsylvania. Notice of consideration of issuance of this amendment was published in the FEDERAL REGISTER on October 22, 1986 (51 FR 37511).

The purpose of the licensee's amendment request was to incorporate new and revised Technical Specification (TS) requirements for operating and testing the Fuel Handling Building (FHB) Engineered Safety Feature (ESF) Air Treatment System and the Auxiliary and FHB Air Treatment System. Included in this request was a proposal to delete TS 4.12.3.2.d, which would eliminate the requirement for operating the Auxiliary and FHB Air Treatment System at least ten hours per month.

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The licensee considered deletion of TS 4.12.3.2.d was justified because the Auxiliary and FHB Air Treatment System was not required to meet the Regulatory Guide (1.52) for ESF ventilation systems, and furthermore, the subject surveillance was not recommended in Regulatory Guide (1.140) for normal ventilation systems. However, due to the accident mitigation role maintained by the Auxiliary and FHB Air Treatment System, even after installation of the new FHB ESF Air Treatment System, the Commission has determined the licensee's justification is insufficient. Consequently, the requirements for operating both ventilation systems at least ten hours per month has been retained.

All other provisions of the amendment request have been approved by Amendment No. 122 dated December 12, 1986. Notice of Issuance of Amendment No. 122 will be published in the Commission's biweekly FEDERAL REGISTER notice.

The licensees were notified of the Commission's denial of the proposed Technical Specification change by letter dated December 12, 1986.

By January 20, 1987, the licensees may demand a hearing with respect to the denial described above and any person whose interest may be affected by this proceeding may file a written petition for leave to intervene.

A request for hearing or petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, or may be delivered to the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C., by the above date.

A copy of any petitions should also be sent to the Office of the General Counsel-Bethesda, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, and to Ernest L. Blake, Jr., of Shaw, Pittman, Potts and Trowbridge, 2300 N Street, N.W., Washington, D.C. 20037, attorney for the licensees.

For further details with respect to this action, see (1) the application for amendment dated August 25, 1986, as revised on October 1, 1986, (2) the Commission's letter to GPU Nuclear Corporation dated December 12, 1986, and (3) the Commission's Safety Evaluation issued with Amendment No. 122 to DPR-50 dated December 12, 1986. These documents are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at the Government Publications Section, State Library of Pennsylvania, Education Building, Commonwealth and Walnut Streets, Harrisburg, Pennsylvania 17126. A copy of items (2) and (3) may be obtained upon request addressed to the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of PWR Licensing-B.

Dated at Bethesda, Maryland, this 12th day of December, 1986.

FOR THE NUCLEAR REGULATORY COMMISSION

John F. Stolz

John F. Stolz, Director
PWR Project Directorate #6
Division of PWR Licensing-B