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50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
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VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Forwards addl info re NUREG-0737,Item III.D.3.4, "Control Room Habitability Requirements," per 830106 request.Design changes made & justification provided for unsubstantial backfit items,per 830307 ltr.

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FLORIDA POWER & LIGHT COMPANY

August 9, 1983
L-83-441

Office of Nuclear Reactor Regulation
Attention: Mr. Steven A. Varga, Chief
Operating Reactor Branch #1
Division of Licensing
U.S. Nuclear Regulatory Commission

Dear Mr. Varga:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
Post TMI Requirements
Control Room Habitability
NUREG-0737 Item III.D.3.4

The attachment to this letter contains FPL's response to your letter of January 6, 1983, requesting additional information on NUREG-0737 Item III.D.3.4 "Control Room Habitability Requirements". As discussed in our letter of March 7, 1983 (L-83-128), FPL has chosen the option of making design changes we feel necessary and justifying present design for those backfit items that do not provide substantial, additional protection for the public health and safety.

Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems and Technology

REU/GJK/mrl

Attachment

cc: J. P. O'Reilly, Region II
Harold F. Reis, Esquire

A046

ATTACHMENT

Re: Turkey Point Units 3 & 4
Post TMI Requirements
Control Room Habitability
NUREG-0737 Item III.D.3.4

References:

(a) FPL Letter No. L-81-285 dated July 9, 1981

(b) FPL Letter No. L-82-298 dated July 22, 1982

(c) Letter from D. W. Murphy, Battelle Pacific Northwest Laboratories to L. G. Hulman, NRC, March 15, 1982. (Attachment to Ref. (d))

(d) NRC letter dated April 28, 1982

(e) FPL Letter No. L-82-240 dated June 9, 1982

(f) NRC letter dated January 6, 1983

(g) NRC letter dated May 3, 1982

In NUREG-0660, NRC Action Plan Developed as a Result of the TMI-2 Accident, the staff outlined an approach to ". . . assure that workers are adequately protected from radioactivity, radiation, and other hazards, and that the control room can be used in the event of an emergency." This review was to judge conformance with Regulatory Guides 1.78 and 1.95 and Standard Review Plan Sections 2.2.1, 2.2.2, 2.2.3, and 6.4 and establish a schedule for necessary modifications. Clarification of this Action Plan item was subsequently issued in NUREG-0737 Clarification of TMI Action Plan Requirements. The staff position for this issue (III D.3.4) was that operating licensees comply with General Design Criterion 19 "Control Room" of Appendix A to 10CFR50. As such, licensees that did not meet current guidance criteria were required to perform necessary evaluations and identify appropriate modifications. This review was not intended to require backfitting operating reactors to present day standards, but rather to ensure that the Control Room Habitability System was sufficiently designed to afford a safe level of protection.

FPL submitted the Control Room Habitability Study for Turkey Point Units 3 and 4 in July 1981. This study was performed as required by the Action Plan and identified appropriate modifications which should be made to meet GDC 19 and to reduce the exposure to the control room operators. These modifications were described in detail in Reference (a) and have been implemented.

A review of the Turkey point Control Room Habitability Study was conducted by Battelle Pacific Northwest Laboratories for the NRC (Reference (c)). This review concluded that the Turkey Point Control Room would meet the requirements of SRP 2.2.1, 2.2.3, and 6.4 and GDC 4, 5 and 19 upon completion of FPL proposed modifications and implementation of changes recommended by Battelle. The recommended changes were:

1. Install redundant dampers at all intakes and outlets that have direct access to the outside.

2. Install airborne radiation monitors in each emergency air intake.

3. Provide additional self-contained breathing apparatus (SCBA) for control room personnel.

At that time the staff agreed with the Battelle recommendations and concluded ". . . that the control room habitability systems are acceptable" with the inclusion of the previously identified modifications (Reference (d)). In May 1982 (Reference (g)) the NRC modified and expanded their position to require justification why a radiation detection and isolation system in the control room normal air intakes was not necessary. References (b) and (e) were FPL's response to these NRC concerns.

After review of references (b) and (e), the NRC raised additional concerns regarding the adequacy of the Turkey Point Control Room HVAC system. Specifically, the NRC was concerned that failure of the emergency supply fan (SF-1) could result in the loss of required ventilation system function. As described in previous correspondence, it is FPL's intent to comply with the requirements of GDC-19. This intent should not be construed to mean the system will meet the "single-failure" criteria stipulated in the guidance documents the NRC and contractors used in their review. The General Design Criteria for which Turkey Point was licensed do not require that emergency systems, of which the Control Room HVAC is a part, be single-failure proof. The HVAC system with current modifications provides a substantial level of safety. The incremental increase in safety margin to completely "single-failure proof" the present design cannot be justified based on the additional expenditures required.

The following provides specific responses to the NRC concerns expressed in Reference (f).

NRC Staff Position

"The control room habitability systems, as engineered safety features, must be capable of performing their safety-related function given the failure of any single active component. It appears, based on the information provided, that the failure of any one of the following active components could result in the loss of the required ventilation system functions:

a) normal intake isolation damper, D-1
b) emergency supply fan, SF-1
c) volume control damper, D-20

In addition, it would be necessary to close volume control damper D-20, if either emergency intake damper D-2 and D-3 were unable to close when isolation and recirculation were demanded. The July 22, 1982, response refers to D-20 as "fixed".

Provide justification that the failure of any one of the active components identified above will not result in the loss of the required ventilation system safety functions or provide proposed design modifications".

FPL Response

The design of the Control Room HVAC system, which is an emergency system and not an engineered safety system, is not single-failure proof, nor would there be a sufficient increase in safety to justify the additional expense of making it so. Following the Control Room Habitability Study, FPL began an extensive program upgrading the HVAC system to allow pressurization of the control room following an accident to reduce potential in-leakage and keep operator exposure below the limits of GDC-19. This modification includes the replacement of the multiple blade normal intake damper (D-1) with a single blade, tight sealing damper. The replacement is a reliable, low leakage, tight fitting, qualified damper with a back-up handwheel. This handwheel provides for back-up operation in the event that an electrical malfunction results in a failure to isolate the normal intake. If indeed the damper should fail during the unlikely event of a design basis accident, electrical failure would clearly be the most likely failure mode and the HVAC system functional capability would be preserved through manual operation. Since the cost to install an additional normal intake damper is in excess of $100,000, FPL does not consider this modification to be cost-effective and does not intend to backfit the HVAC system to accommodate this item.

The installation of an additional emergency supply fan would also go far beyond the original license design basis regarding redundancy. The cost to backfit this item is in excess of $235,000 and not justified by the very small incremental increase in safety margin obtained.

Damper D-20 is a fixed position, volume control damper that performs no active function once it is positioned during initial HVAC balance. In order to maintain operator exposures below the requirements of GDC-19 this damper is adjusted to provide a predetermined filtered emergency air intake following an accident. It does not serve an isolation function since filtered intake is provided to remain within the dose limits of GDC-19. On an isolation signal dampers D-2 and D-3 open to provide emergency intake air and thus D-20 is not needed as a redundant isolation damper. See Figure 1.

NRC Staff Position

"To comply with GDC-19, the staff requires radiation monitors in the normal air intake to initate isolation of that intake upon detecting radiation well above background and for radiation monitors in the emergency intakes to permit operators to minimize control room doses in the event of an accident.

You have indicated that any onsite release would either cause control room ventilation isolation by other signals, or would result in doses in the control room under normal ventilation that were below GDC-19 limits. The staff requires that GDC-19 limits do not supercede 10 CFR Part 20 requirements except for the most severe accidents, nor do we believe that failure to protect the control room against contamination from minor accidental releases is an acceptable risk. In addition, you have indicated that the emergency intakes are used only during accidents and radiation monitors there would only serve to quantify what the control room operators would expect. Our position is that radiation monitors in the emergency intakes provide information which would be of value to the operators in minimizing their doses, and constitute sources of information useful in responding to accidents of much greater value than that obtainable from detectors within the control room itself.
Provide additional justification or a commitment to install radiation monitors in the normal and emergency air intakes".

FPL Response

FPL proposes to install a radiation monitor in the normal air intake that will automatically isolate and pressurize the control room through the filtered emergency intake. As discussed above the licensing criteria to which Turkey Point was licensed does not require single failure criteria be applied to the Control Room HVAC. Therefore, only a single reliable radiation monitor and instrument channel will be used in the design. This is considered adequate since the operator still has several other local control room indications of a radiological accident and is able to take manual actions to protect the control room atmosphere if necessary.

FPL does not intend to install radiation monitors in the emergency air intakes. The basis for the regulatory guidance to install these detectors is embodied in the preliminary review of the Turkey Point Control Room Habitability Study conducted by Battelle Pacific Northwest Laboratories (Reference (c)). The review recommended that ". . . airborne radiation monitors need to be installed in each of the emergency air intakes so that the operator can readily identify which air intake can be utilized without compromising the habitability of the control room".

This statement implies a misunderstanding of the operation of the control room HVAC system. The following is a description of the operation of this equipment. (See Figure 1 for details).

Upon receipt of an isolation signal (containment Phase A isolation, high radiation at plant stack, or normal HVAC intake high radiation) the control room HVAC will automatically isolate the normal intakes and exhausts, open the emergency intakes, and line up and start the emergency supply fan (SF-1). This provides a filtered intake that is used to pressurize the control room. Additionally, some of the recirculated control room atmosphere is routed through the filters for purification.

Damper D-20 is a fixed volume control damper adjusted to provide a predetermined flow (250 cfm) of outside air to the filter. This flow is required to maintain control room pressure to prevent infiltration of unfiltered air. Damper D-21 is also a fixed volume control damper adjusted to provide a constant recirculated purification flow (750 cfm). Neither of these dampers is positioned after the initial ventilation system balance.

The operation of the emergency air intake during the Maximum Hypothetical Accidental (MHA) is not optional. The control room atmosphere is maintained in a safe condition by operation of a filtered intake. If the emergency air intake is not utilized, then unfiltered bypass leakage will occur which may create a potentially hazardous condition. Our radiation analysis performed for the Control Room Habitability Study based on the MHA showed that doses would be within GDC-19 limits only through the use of the emergency air intake and it is our position that the emergency intake be used. There is no total recirculation mode for Turkey Point.

Apparently Battelle's concern about radiation monitors in the emergency intake originates from the assumption that the operator should have information available to indicate which emergency intake is supplying more contaminants so that isolation of that intake can be initiated. From a meteorological viewpoint, there is no significance as to which emergency intake is open since both draw

from approximately the same atmospheric location. Therefore, the radiation monitors in the two emergency intake lines would not provide the operator with meaningful information from which to perform any isolation function.

In Reference (f) the NRC expressed the position that emergency intake radiation monitors provide information for the operators to minimize their doses and information useful for responding to accidents. As discussed above no operator action after Control Room isolation and pressurization is necessary to further reduce exposure.

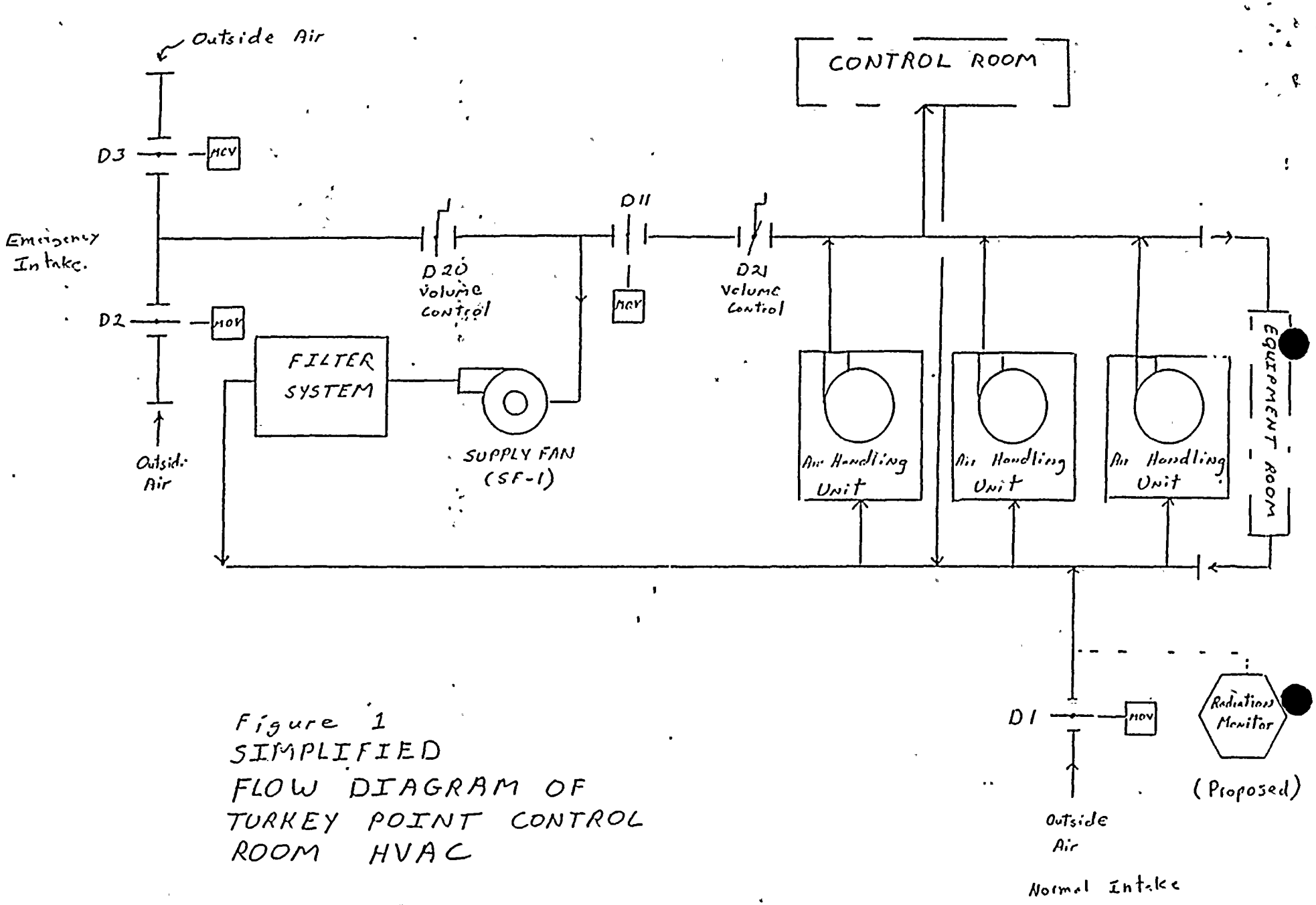

Figure 1
SIMPLIFIED
FLOW DIAGRAM OF
TURKEY POINT CONTROL
ROOM HVAC

Ref: Dwg. 5177-181-M-1 Rev 4