Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

June 28, 1982

Mr. Darrell G. Eisenhut, Director
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
NUREG 0737 Item III.D.3.4
Control Room Habitability Studies
NRC Docket Nos. 50-237/249 and 50-254/265

References (a): L. O. DelGeorge letter to D. G. Eisenhut dated September 1, 1981

(b): E. D. Swartz letter to D. G. Eisenhut dated December 17, 1981

(c): E. D. Swartz letter to D. G. Eisenhut dated June 4, 1982

Dear Mr. Eisenhut:

References (a) and (b) provided the final Control Room Habitability Reports required by NUREG 0737 Item III.D.3.4 for our Dresden and Quad Cities Stations. Subsequently, Reference (c) provided our response to Generic Letter No. 82-10 for this Item III.D.3.4 and confirmed our schedule for completion of the proposed modifications that we identified as being necessary in these final control room habitability studies.

As stated in Reference (c), the Commonwealth Edison Company is proceeding with the design of these modifications to allow for our scheduled January 1, 1984 completion date. However, during the design process, we have discovered certain details of our proposed modifications that require changing. These changes do not represent a departure from the concept of our proposed modifications, but rather a change in actual details of implementing the proposed concepts.

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As a result, discussions were held with Messrs. Roby B. Bevan and Harry E. Krug on June 17, 1982 to discuss our desired changes. Attachment A, (Parts I and II) to this letter document these changes and provides the requisite page changes to our Reference (b) Dresden and Quad Cities Station control room habitability studies.

Additionally, the topics of hydrofluoric acid monitoring, redundancy of outside air intake and exhaust duct dampers, and qualification of toxic monitoring equipment were discussed concerning our Quad Cities Station study. The Attachment A, Part II to this letter also discusses these topics.

We believe that the enclosed information should not negatively impact the results of the NRC Staff evaluation of our Dresden and Quad Cities Station control room habitability studies. Additionally, we are hopeful that this submittal will aid the NRC Staff in their preparation of favorable SERs concerning our studies.

Please address any further questions that you or your staff may have concerning this matter to this office.

One (1) signed original and fifty-nine (59) copies of this letter with Attachment are provided for your use.

Very truly yours,

E. Douglas Swartz

E. Douglas Swartz
Nuclear Licensing Administrator

Attachment

cc: J. G. Keppler, Region III
RIII Inspector - Dresden
RIII Inspector - Quad Cities
Roby B. Bevan - ORB 2
Joseph D. Hegner - ORB 2
Paul W. O'Connor - ORB 5

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ATTACHMENT A

COMMONWEALTH EDISON COMPANY

DRESDEN STATION UNITS 2 and 3

QUAD CITIES STATION UNITS 1 and 2

NUREG 0737 Item III.D.3.4 Control Room Habitability Study - Revision 2 dated June 14, 1982.

PART I

DRESDEN STATION

The following pages and figure are attached:

1) Page 5-1, Revision 2 dated June 14, 1982

2) Page 5-2, Revision 2 dated June 14, 1982

3) Figure 1, Revision 2 dated June 14, 1982

Please remove Pages 5-1, 5-2 and Figure 1 from our Reference (b) Dresden Station control room habitability study and insert the above identified Revision 2 pages.

The basis for the above changes are as follows:

a) The Dresden Station Control Room Habitability Study prepared by Bechtel Power Corporation for Commonwealth Edison was originally offered to our Company as a proposed conceptual HVAC design. Our development of the actual design details required to implement the conceptual designs has necessitated certain changes.

   Figure 1, Revision 2 provides the schematic representation of our conceptual design. It is expected that further revisions will become necessary as P&IDs are finalized. If this activity results in a deviation from our proposed conceptual design, the NRC Staff will be so notified.

b) The new return air fan "B" as shown on Figure 1, Revision 1 and listed as a proposed modification in paragraph 5.3.d on page 5-2 has been shown to not be required. Detailed calculations now show that the supply fan of the new air handling unit "B" has sufficient static pressure capacity to provide the required air flow in all areas. Therefore, the new return air fan "B" is no longer considered necessary and has been eliminated from our proposed modifications.

c) Bubble tight and/or low leakage dampers will be used as deemed necessary and as conceptually shown on Figure 1, Revision 2. However, as designs are finalized, the actual configuration (use and location) may change.

5.0 DRESDEN STATION HVAC CONCEPTUAL DESIGN

Rev. 2

5.1 OVERVIEW

The following section presents proposed modifications to the existing control room HVAC system to meet the intent of NUREG 0737, Item III.D.3.4 and SRP 6.4, and to satisfy the requirements of General Design Criterion 19 regarding control room habitability following a radiological DBA. These modifications include the addition of a redundant system (train B) consisting of an air handling unit (AHU), , cooling system, associated piping, ducts, dampers, and appurtenances, and an air filtration unit (AFU) common to both air handling systems.

Rev. 2

5.2 EMERGENCY ZONE

SRP 6.4 defines the boundaries for a control room emergency zone. Within this zone, the plant operators are adequately protected against the effects of accidental radiological gas and toxic gas releases. This zone also allows the control room to be maintained as the center from which emergency teams can safely operate in a design basis radiological release.

To satisfy this requirement, the following areas are included in the emergency zone.

a. Main control room for Units 1, 2, and 3, which includes all critical documents and reference files, and toilet and locker rooms for Unit 1

b. Computer room for Units 2 and 3

c. New HVAC equipment room, which houses the new train B system

Areas outside the emergency zone, which are normally serviced by the existing AHU system (train A), shall be isolated in emergency conditions. Support rooms such as the kitchen and offices are accessible to operators with the aid of breathing equipment. The existing HVAC equipment room is also not included in the emergency zone.

5.3 PROPOSED MODIFICATIONS

The proposed HVAC system design modifications are described below. Figure 1 provides a schematic of the proposed system.

a. The Unit 1 control room will receive cooling from the Units 2 and 3 main control room HVAC system.

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b. Existing supply AHU train A, return air fan A, and all related ductwork will be utilized.

c. New supply AHU train B will be located in a new HVAC equipment room. AHU train B will be sized to supply the emergency zone as discussed in Section 5.2. Ducts from new AHU train B will be connected to the corresponding ducts of the existing air handling system. A suggested possible arrangement is outlined in Figure 1.

d. New AHU train B will also have outside air of 2,000 cfm. Rev. 2

e. A new AFU, sized to accommodate 2,000 cfm, will be located in the new HVAC equipment room. This unit will consist of a prefilter, electric heating coils, high-efficiency particulate air (HEPA) filter, charcoal filters, HEPA filter, and two full-capacity fans. The AFU will be in compliance with Regulatory Guide 1.52.

f. A new 100%-capacity cooling system for train B will be installed in the new HVAC equipment room.

g. Bubbletight and low-leakage dampers will be used as required. Rev. 2

5.4 MODIFIED SYSTEM OPERATION

For normal conditions, the AHU train A system will operate as discussed in Section 2.0.

For an emergency condition, as determined by radiation monitors in the reactor building ventilation manifold, system operation will be as follows. Within 8 hours, the isolation dampers will isolate the normal outside air intake to the AHUs and all ventilation zones which are not mentioned in Section 5.2 above. Rev. 2 The outside air damper to the new AFU will be remote manually opened and an AFU fan will begin supplying filtered air to one AHU train. Rev. 2 Barring component failures in the operating AHU train, the system will continue to operate in this manner for the duration of the emergency.

On failure of airflow in the operating AHU train system, that train will be isolated and the redundant train energized. Rev. 2 Outside air will be supplied to the redundant AHU train by an AFU fan in this operating mode.

DRESDEN FIGURE-1

CONTROL RM HVAC SCHEMATIC

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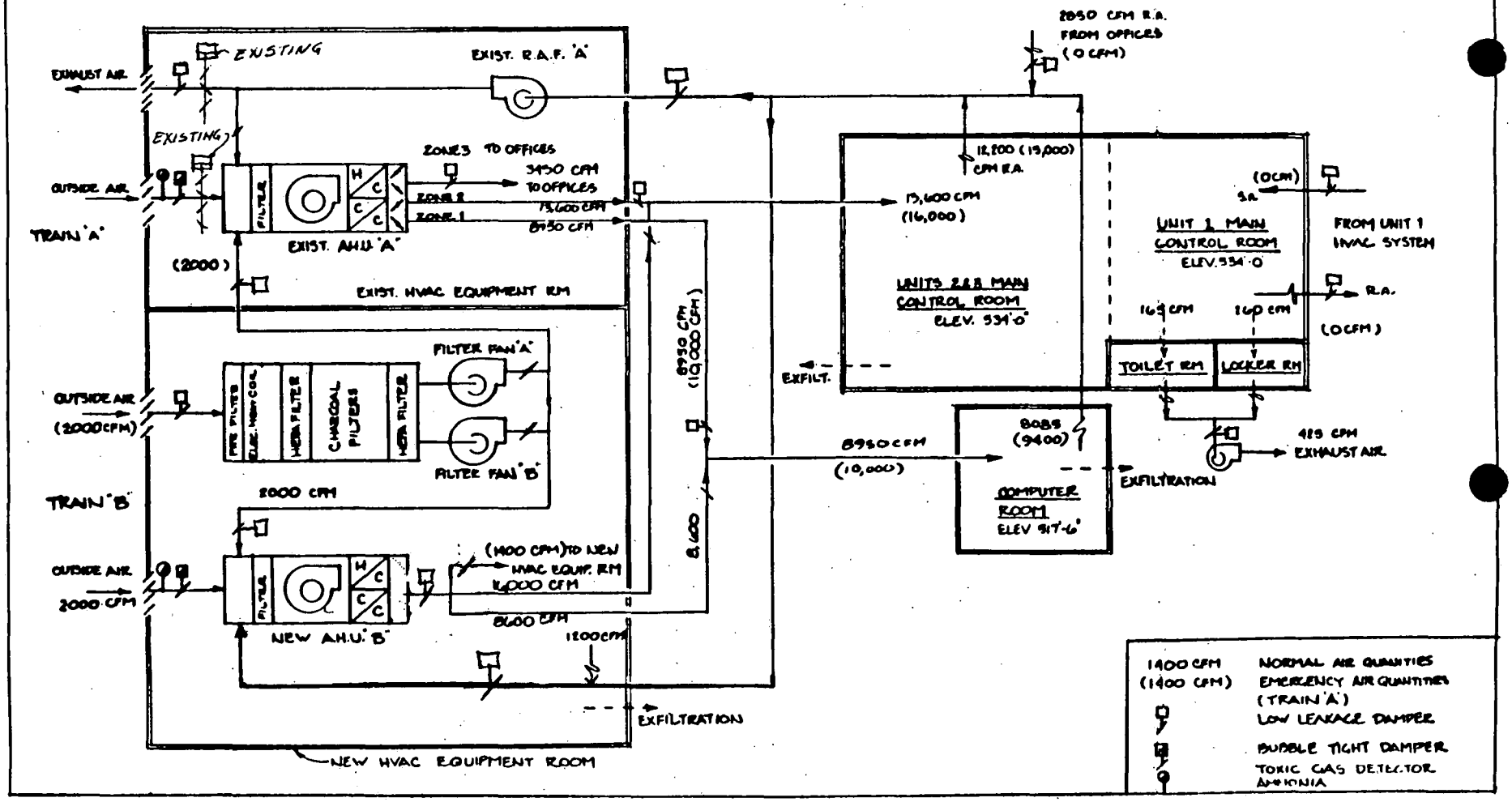

PART II

QUAD CITIES STATION

The following pages and figure are attached:

1) Page 5-1, Revision 2 dated June 14, 1982

2) Page 5-2, Revision 2 dated June 14, 1982

3) Page 5-3, Revision 2 dated June 14, 1982

4) Figure 1, Revision 2 dated June 14, 1982.

Please remove Pages 5-1, 5-2, 5-3, and Figure 1 from our Reference (b) Quad Cities Station Control Room Habitability Study and insert the above identified Revision 2 pages.

The basis for the above changes are as follows:

a) The Quad Cities Station Control Room Habitability Study prepared by Bechtel Power Corporation for Commonwealth Edison was originally offered to our Company as a proposed conceptual HVAC design. Our development of the actual design details required to implement the conceptual designs has necessitated certain changes.

   Figure 1, Revision 2 provides the schematic representation of our conceptual design. It is expected that further revisions will become necessary as P&IDs are finalized. If this activity results in a deviation from our proposed conceptual design, the NRC Staff will be so notified.

b) The new return air fan "B" as shown on Figure 1, Revision 1 and listed as a proposed modification in paragraph 5.3.c. on page 5-2 has been shown to not be required. Detailed calculations now show that the supply fan of the new air handling unit "B" has sufficient static pressure capacity to provide the required air flow in all areas. Therefore, the new return air fan "B" is no longer considered necessary and has been eliminated from our proposed modifications.

c) Bubble tight and/or low leakage dampers will be used as deemed necessary and as conceptually shown on Figure 1, Revision 2. However, as designs are finalized, the actual configuration (use and location) may change.

d) The new 100% capacity chilled water system for train "B" listed as a proposed modification in paragraph 5.3.e on page 5-2 cannot be installed due to space limitations, excess weight, additional power requirements, and equipment availability. In lieu of the above, a water cooled condensing unit will be utilized to fulfill our requirements.

The following topics were discussed with Messrs. Roby B.Bevan and Harry E. Krug on June 17, 1982 concerning the Quad Cities Study:

1) Redundancy of the outside air intake and exhaust dampers - The figure 1 schematic representation of the Quad Cities Control Room HVAC has been revised. Revision 2 dated June 14, 1982 now contains more detail as to existing plant dampers. As can be seen, by taking credit for existing dampers, redundancy of dampers will exist concerning the intake and exhaust of outside air.

2) Hydrofluoric acid monitoring - Concerning our conclusion that hydrofluoric monitoring is not necessary (paragraph 3.5.a.5 on page 3-5 of the Quad Cities study), our consultants have re-reviewed this item. Utilizing the conservative NRC Staff meteorological criteria, it has been determined that our control room personnel will have 114 seconds to act from their threshold of odor sensation to the time when the concentration reaches the toxicity limit.

   We understand that the 120 second time limit chosen by the NRC Staff was arbitrarily set. It is our judgment that the six (6) second difference between the results of our Quad Cities Station study and the NRC Staff time limit does not present a safety concern to our control room personnel. However, the Commonwealth Edison Company will re-review the conservatisms included in our calculations and parameters (including review of the actual Quad Cities site meteorological data base versus NRC criteria) used to arrive at our 114 second results. We will commit to providing hydrofluoric acid monitoring if the results show that less than two (2) minutes is available from the time of control room personnel threshold perception of odor to the time when concentration reaches the toxicity limit.

3) Qualification of toxic monitoring equipment - We have reviewed the availability of qualified detectors and to our knowledge, only chlorine and ammonia detectors can be procured as safety-related. For the detectors that have been identified as being necessary, we will procure the most reliable toxic detector available. It is our intent to provide equipment that is qualified consistent with the system qualification requirements.

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5.0 QUAD CITIES STATION HVAC CONCEPTUAL DESIGN

Rev. 2

5.1 OVERVIEW

The following section presents proposed modifications to the existing control room HVAC system to meet the intent of NUREG 0737, Item III.D.3.4 and SRP 6.4, and to satisfy the requirements of General Design Criterion 19 regarding control room habitability following a radiological DBA. These modifications include the addition of a redundant system (train B) consisting of an air handling unit (AHU), cooling system , associated piping, ducts, dampers, and appurtenances, and an air filtration unit (AFU) common to both air handling systems.

Rev. 2

5.2 EMERGENCY ZONE

SRP 6.4 defines the boundaries for a control room emergency zone. Within this zone, the plant operators are adequately protected against the effects of accidental radiological gas releases. This zone also allows the control room to be maintained as the center from which emergency teams can safely operate in a design basis radiological release.

To satisfy this requirement, the following areas are included in the emergency zone.

a. Main control room, which includes all critical documents and reference files

b. Cable spreading room

c. Auxiliary electrical equipment room

d. Computer room

e. New HVAC equipment room, which houses the new train B system

Areas outside the emergency zone, which are normally serviced by the existing AHU system (train A), shall be isolated in emergency conditions. Support rooms such as the kitchen, offices, and washrooms are accessible to operators with the aid of breathing equipment. The existing HVAC equipment room is also not included in the emergency zone.

5.3 PROPOSED MODIFICATIONS

The proposed HVAC system design modifications are described below. Figure 1 provides a schematic of the proposed system.

a. Existing supply AHU train A, return air fan A, and all related ductwork will be utilized.

b. New supply AHU train B will be located in a new HVAC equipment room. AHU train B will be sized to supply the emergency zone as discussed in Section 5.2. Ducts from new AHU train B will be connected to the corresponding ducts of the existing air handling system. A suggested possible arrangement is outlined in Figure 1.

c. New AHU train B will also have outside air of 2,000 cfm. Rev. 2

d. A new AFU, sized to accommodate 2,000 cfm, will be located in the new HVAC equipment room. This unit will consist of a prefilter, electric heating coils, high-efficiency particulate air (HEPA) filter, charcoal filters, HEPA filter, and two full-capacity fans. The AFU will be in compliance with Regulatory Guide 1.52.

e. A new 100%-capacity cooling system for train B will be installed in the new HVAC equipment room. Rev. 2

f. Bubbletight and low-leakage dampers will be used as required. Rev. 2

5.4 MODIFIED SYSTEM OPERATION

For normal conditions, the AHU train A system will operate as discussed in Section 2.0.

For an emergency condition, as determined by radiation monitors in the reactor building ventilation manifold, system operation will be as follows. Within 8 hours, isolation dampers will isolate the normal outside air intake to the AHUs and all ventilation zones which are not mentioned in Section 5.2 above. Rev. 2

Within 8 hours, the outside air damper to the new AFU will be remote manually opened and an AFU fan will begin supplying filtered air to one AHU train. Rev. 2

Barring component failures in the operating AHU train, the system will continue to operate in this manner for the duration of the emergency.

On failure of airflow in the operating AHU train system, that train will be isolated and the redundant train energized. Outside air will be supplied to the redundant AHU train by an AFU fan in this operating mode. Rev. 2

In the event that toxic gases are detected as discussed in Section 3.5 of this report, all outside air intakes and all ventilation zones which are not mentioned in Section 5.2 will be isolated. The AHU will supply 100% recirculated air to the emergency zone.

FIGURE 1

QUAD CITIES

CONTROL RM HVAC SCHEMATIC

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