

**Florida
Power**
CORPORATION

September 24, 1984
3F0984-06

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Crystal River Unit 3
Docket No. 50-302
Operating License No. DPR-72
Appendix R Exemption Requests

Dear Sir:

On May 25, 1984, several members of Florida Power Corporation's (FPC's) Fire Protection Task Force met with members of your staff. This meeting was scheduled to discuss both evolving NRC Staff guidance and FPC's developing program for overall improvement in all facets of our Fire Protection Program, including Appendix R required activities. At that time, we identified several major milestones. These include:

| | |
|--------------------|--------------------------------------------------------------------------|
| July 18, 1984 | Submittal of a draft Appendix R Exemption for format and content review. |
| September 30, 1984 | Submittal of actual exemption requests. |
| October, 1984 | Meeting with Staff to discuss exemptions. |
| February, 1985 | Submittal of Revised Fire Hazard's Analysis and Fire Protection Plan. |
| March 9, 1985 | Beginning of Refuel V. |
| July, 1985 | Completion of Refuel V. |

Florida Power was informed in August 1984 that your staff had not been able to dedicate resources to the review of our July 18, 1984 submittal and would begin their review the first week of September 1984. FPC, therefore, proceeded with the development of exemptions based on information available on other dockets but without the benefit of any direct feedback. FPC did receive feedback on September 18, 1984, just prior to this first of two sets of exemption submittals. FPC has incorporated the results of this feedback in the attached exemption requests.

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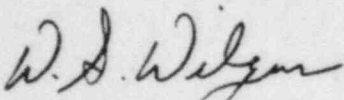
Pursuant to 10 CFR 50.12, Florida Power Corporation hereby requests exemption from certain requirements of 10 CFR 50.48 and Appendix R identified herein. A check for \$150 for the initial application fee, required by 10 CFR 170, is included with this submittal. The attached includes: six specific technical exemption requests; a section involving general information concerning definitions and FPC's interpretation of certain Appendix R requirements; and an evaluation of our existing Decay Heat Pump Fire Protection capabilities. A second submittal with additional technical exemptions, as well as a schedular exemption addressing several aspects of our modification activities will be submitted by October 5, 1984.

In addition, FPC requests a meeting on October 17, 1984 to discuss the technical content of FPC's exemption requests and a meeting on October 18, 1984 with appropriate Senior Staff personnel to discuss our schedular exemption and the impact of Appendix R on our Refuel V schedule. If the Staff can provide conceptual approvals at these meetings, FPC will commit the resources necessary to improve the level or quality of detailed information in the requests to support Staff approval. This will allow FPC management to make several purchasing and manpower decisions, based on the results of these discussions, to support modification activities during Refuel V.

This program is of utmost importance to FPC. Should these exemptions be denied, Refuel V will be extended several weeks beyond the 20-week outage currently planned. In addition, the impact on manpower and material costs will be substantial.

FPC has concluded that, with the approval of these exemption requests, a very high degree of fire protection will be achieved, without unnecessary and unreasonable costs and schedule delays simply to meet the letter of the requirements. The additional expenditures necessary to provide full compliance would not provide commensurate improvements in fire protection.

Sincerely,



W. S. Wilgus, Vice President
Nuclear Operations

WSW/feh

Attachments

GENERAL INFORMATION

The following information is provided to establish a basis for Appendix R exemption requests for Crystal River Unit 3 (CR-3). These factors apply to all exemption requests, and are presented here to eliminate the need to repeat them in individual exemption requests. The following definitions apply to these terms as used in the exemption requests.

HOT SHUTDOWN EQUIPMENT OR COMPONENT: Those components designated for use to shutdown and cooldown the plant under the conditions specified by Appendix R. This is a limited list of equipment which has been chosen from the full complement of equipment that could be used for plant shutdown. Hot shutdown components have been evaluated for the effects of fire and Appendix R modifications have been designed to protect them.

COLD SHUTDOWN EQUIPMENT OR COMPONENT: Those components designated for use to achieve and maintain cold shutdown conditions in combination with hot shutdown equipment following a fire. Cold shutdown components need not be operable immediately following a fire.

SAFE SHUTDOWN EQUIPMENT OR COMPONENTS: The combination of hot shutdown equipment and cold shutdown equipment.

SAFE SHUTDOWN CIRCUITS: Electrical circuits which are needed for operability of safe shutdown equipment.

FIRE HAZARDS ANALYSIS (FHA)

The fire hazards analysis for Crystal River Unit 3 is currently being updated.

Fire hazards data presented in the enclosed exemption requests is based on field walkdowns conducted since May 1984 and although the entire update is not completed, combustible loadings for the exemption areas or zones are completed and verified. The results are listed as preliminary, however, because the entire FHA update is not complete. The fire hazards analysis identifies both fire areas and fire zones. Fire areas are defined as areas of the plant bounded on all sides by 3-hour rated fire barriers or exterior walls. In specific instances where total boundary sealing with a rated barrier is impossible, impractical, or evaluated as unnecessary, exemptions will be requested and alternative measures to prevent fire propagation will be proposed.

Fire zones have been used in the fire hazards analysis to identify subdivisions within a fire area. Zones have been chosen according to the layout of existing walls, floors, ceiling, and clear spaces. Zone walls, floors, or ceilings may contain unsealed penetrations, and thus cannot be classified as rated barriers. They are in most cases of reinforced concrete construction. No credit has been taken, or is assumed for zone boundaries providing protection functionally redundant components or cable in adjacent zones. Where protection of functionally redundant components by zone boundaries is considered defensible, exemptions will be requested.

Cable tray and conduit protection has been designed without consideration for fire zone boundaries, and considers fire damage a potential anywhere within a fire area. Tray and conduit protection has been designed to assure that within a given fire area at least one train of hot shutdown equipment will remain free of fire damage. Further, an integrated

set of shutdown systems, which are capable of performing the required shutdown functions to take the plant to hot standby and maintain the plant in that mode, will remain free of fire damage. Systems necessary for cold shutdown of the plant are either provided with protection to assure operability of one train after a fire, or can be repaired within the time allowed with dedicated materials which exist on-site, using post fire repair procedures.

In assessing combustible materials loading for the fire hazards analysis, the following assumptions were applied.

- o In the case of cable trays, trays with less than 50% actual fill were conservatively assumed to contain 50% fill. Where cable trays were filled to greater than 50%, the actual fill amount was used. This is extremely conservative, since very few trays are filled to greater than 50% and the actual plant average tray fill is significantly lower than 50%. Cable tray fill is tracked and controlled by a computer based engineering design program. When subsequent plant modifications increase tray fill above 50%, the actual combustible loading will be re-evaluated to determine continued adequacy of the existing protection features.
- o Where lubricants are contained in pumps, motors, compressors, chillers or motor-operated valves, the total lubricant volume is assumed to be available for combustion, and is included in the area or zone fire loading. This is extremely conservative since these lubricants must leak or be discharged from the equipment in order to be available for combustion.

- o Cables in conduit, interlocked armor, and fire rated envelopes are not considered to be available for combustion and are not added to the area or zone fire loading.
- o Final cable tray wrapping design has not been completed. Combustible material loading data presented in the exemption requests is based on current plant configuration, i.e., no cable tray wraps installed. When wrapping design is complete, combustible material loading will be reduced to reflect the amount of wrapped tray in each zone.
- o Fire severity calculations conservatively assume all combustibles are simultaneously involved in a fire within a fire zone or area. This assumes no credit for fire detection during the incipient stage of a fire, or for the response of automatic suppression systems or manual fire fighting.

FIRE DOORS

Many of the plant fire areas which contain equipment needed for safe shutdown are also classified as vital areas for security. To comply with security regulations, it was necessary to add door alarms, and in many cases, electric door locks in these areas. In most cases, these were added by modifying existing fire doors, thereby voiding fire listings. As a part of our ongoing Appendix R analysis, individual fire doors will be evaluated to determine if security or other modifications have reduced fire resistance capabilities. If modifications have degraded the capability of individual fire doors to function equivalently to their former rating, the doors will be upgraded or exemptions will be pursued.

- o ASTM E-119 equivalent fire severity calculations are based upon the "E" fire severity curve. Heat rate calculations are based upon the fire severity for the amount and type of combustible present.

AUTOMATIC FIRE SUPPRESSION

Florida Power Corporation is aware of the controversy that exists regarding automatic fire suppression system coverage "in" areas containing safe shutdown equipment. The approach used for suppression system design at CR-3 is provided to aid staff fire protection reviewers in understanding the integrated design concepts applied to fire protection at CR-3 during their review of individual exemption requests. Depending upon the outcome of ongoing staff deliberations on the appropriate interpretation of requirements for fire suppression system coverage, Florida Power Corporation will pursue additional exemptions in this area, if necessary.

Protection of safe shutdown equipment in the Auxiliary and Intermediate Buildings is based on an integrated design incorporating a combination of the options offered in Appendix R Section III.G.2 with exemptions requested where appropriate. Based on this integrated approach, Florida Power Corporation believes that our suppression system design coverage meets the requirement of 10 CFR 50 Appendix R, and provides excellent protection from the effects of potential fires.

Fire areas in the Auxiliary Building at CR-3 are quite large and contain numerous fire zones. Many zones contain only radioactive waste processing equipment and are defined by radiation shield walls and cubicles with offset entrances. Most of these zones contain

no safe shutdown equipment; many zones have low combustible material loading and present no significant threat of fire damage to safe shutdown equipment. In zones which have been determined to contain no safe shutdown equipment or cables, and which present no real threat to safe shutdown equipment, automatic fire suppression is not planned. Figures A and B illustrate the planned suppression coverage in the Intermediate and Auxiliary Buildings at CR-3.

SPURIOUS OPERATION

The potential for spurious operation of equipment which could produce deleterious effects on safe shutdown systems was considered in the safe shutdown analysis. Where spurious fire induced operation of equipment could create an unrecoverable plant condition that would disrupt planned safe shutdown evolutions, protection in the form of separation, wrapping, valve position locking or fail-safe modifications have been designed. Other potential spurious operations have been evaluated which will not produce an unrecoverable plant condition. These are manageable utilizing procedural controls and manual operations.

ASSOCIATED CIRCUITS

The component and circuit analysis included not only principal components, but also considered support sub-systems such as lubrication and cooling that are required to assure the principal components will remain functional for the period they are required for safe shutdown. Associated circuits as defined in NRC Generic Letter 81-12, dated February 20, 1981, were also included in the analysis and, where necessary, protection of those circuits or modifications have been provided.

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ALTERNATIVE SHUT DOWN

Appendix R, Section III.L.1 requires, in part, that alternative shutdown capability include the ability to achieve cold shutdown conditions within 72 hours. Alternative shutdown equipment at CR-3 will, in fact, provide that capability. During a loss of offsite power when reactor cooldown will be accomplished using reactor coolant system natural circulation, void formation may occur if cooling is too rapid. Ongoing safety analyses will determine appropriate natural circulation cooldown limits. Those limits will determine the minimum interval from initiation of reactor shutdown due to fire, to entry into cold shutdown conditions. That interval will be specified in CR-3 natural circulation shutdown procedures, and may be greater than 72 hours. Regardless of the minimum interval specified in our procedures, it is our position that Florida Power Corporation meets the intent of Section III.L.1 and no formal exemption in this area is required.

REVIEW PROCESS DESCRIPTION

Based on Florida Power Corporation's (FPC's) understanding of the importance that the NRC staff gave to the quality of our own review of submittals to the NRC (in general, and specifically, for Appendix R Analyses/Exemptions), we established what we consider to be an extremely thorough review process. This subjective review process is the cornerstone of the basis for our exemption requests and demonstrates that the quantitative information contained herein is valid and, in fact, supports the conclusion that these exemptions should be granted.

This process included, but is not limited to, the following:

- (1) Identification of areas where reasonable basis existed and where significant positive impact could be realized was done by our Licensing and Engineering staff in consultation with the legal staff associated with the Nuclear Utility Fire Protection Group. This eliminated frivolous requests, as well as those with a poor chance of resolution based on review of exemptions granted, to date, for the industry as a whole.
- (2) Each exemption was reviewed by FPC's Fire Protection Task Force, which consists of Licensing, Compliance, Quality Assurance, Engineering, Fire Protection, Project Management, Operations, Maintenance, and other groups of FPC staff who are cognizant of Appendix R intent and requirements, as well as other facets of Fire Protection, in general.
- (3) In addition to the above committee review, individual reviews were performed by Operations (including SRO licensed personnel), Engineering (Plant and Corporate), Fire Protection (certified fire protection engineer), and others who are cognizant of Appendix R intent and requirements.
- (4) As part of the necessary contractor support to accomplish various aspects of Appendix R, several independent contractors are utilized. Some of these contractors also reviewed our exemption requests in the following stated level of detail.

- o Contract Project Manager (Fluor) reviewed all requests in great detail including walkdowns, etc.
- o Architect/Engineering firms (SWECO and Gilbert) reviewed applicable details associated with circuit routing, equipment and structural layout, etc.
- o Contractor developing revised Fire Hazards Analysis (Impell) reviewed exemptions in minute detail including content and format, fire analysis details, etc. Reviews included separate independent walkdowns by two certified fire protection engineers and several walkdowns and analyses by other staff personnel.
- o Contractors used to supplement licensing staff (SAI) were very cognizant of the necessary level of detail and quality necessary for such submittals, in general, and management of the project was accomplished by an individual responsible for the original CR-3 Fire Hazards Analysis and a former ACRS Fellow.

As the above demonstrates, FPC utilized several avenues to assure that these exemptions represented good fire protection practices and were supported by necessary and sufficient technical detail. After this technical review, normal FPC management review for NRC submittals was supplemented by special reviews by all Nuclear Operations Directors through delegation to staff not previously involved in the exemption development. Therefore, FPC is confident the resulting requests are reasonable, and show a good faith effort to meet the intent of Appendix R through alternate forms of protection or conservative analyses.

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EXEMPTION REQUEST #1

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.2, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirements to separate redundant hot shutdown components, located in the same fire area, with a rated fire barrier. The fire area is IB-95-200, in the Intermediate Building at the 95 foot elevation. This exemption request applies to the separation of redundant Emergency Feedwater System pumps and valves which are located in this fire area.

B. REDUNDANT HOT SHUTDOWN COMPONENTS/CIRCUITS IN FIRE ZONES

IB-95-200A and IB-95-200B

Fire Zone IB-95-200A

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|-------------------------------|--------------|----------------|
| Motor Driven EFW Pump | A | EFP-1 |
| EFW to OTSG A Isolation Valve | A | EFV-14 |
| EFW to OTSG B Isolation Valve | A | EFV-33 |

Fire Zone IB-95-200B

| | | |
|-----------------------------------|---|--------|
| EFW to OTSG B Flow Control Valve | A | EFV-57 |
| *EFW to OTSG A Flow Control Valve | A | EFV-58 |
| Turbine Driven EFW Pump | B | EFP-2 |
| EFW to OTSG A Isolation Valve | B | EFV-11 |
| EFW to OTSG B Isolation Valve | B | EFV-32 |
| EFW to OTSG A Flow Control Valve | B | EFV-56 |
| EFW to OTSG B Flow Control Valve | B | EFV-55 |

*Circuits only - component located in a separate fire area.

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

The fire area is bounded by the following 3-hour rated walls:

| <u>Boundary</u> | <u>3-Hour Wall</u> |
|-----------------|-----------------------------|
| North | Turbine Building |
| East | Auxiliary Building |
| South | Reactor Building |
| West | Exterior Wall (below grade) |

The ceiling is constructed of reinforced concrete with piping and ventilation penetrations to the area above. There are also other openings covered by large gratings. These openings will be sealed. Ventilation penetrations are provided with 3-hour fire dampers. Piping penetrations are not sealed. There are tendon access penetrations and other openings which are sufficiently removed from combustible materials and safe shutdown equipment to present no hazard. Seismic "rattle spaces" between adjacent buildings are sealed with a non-rated material.

The floor in this area is reinforced concrete and no rooms exist below it. (There are, however, access pits to the Reactor Building tendon system and floor drains that communicate with the Turbine Building.)

Fire zones IB-95-200A and IB-95-200B are adjacent zones in a larger fire area as shown in Figures 1-1 and 1-2.

Fire zone IB-95-200A is bounded by 3-hour rated fire walls on the south, and partially on the west side. The remainder of the west side is the tendon access gallery which contains virtually no combustibles. The zone is bounded on the north by a reinforced concrete wall with numerous penetrations which will be sealed. The east boundary of zone IB-95-200A is shared with the west boundary of fire zone IB-95-200B.

Fire zone IB-95-200B is bounded by 3-hour rated fire walls on the south and east sides. The north boundary is a reinforced concrete wall. The shared boundary between zones IB-95-200A and IB-95-200B, which separates redundant hot shutdown equipment, includes a two foot thick, eight foot high, concrete wall. This wall extends from the north wall of the fire area south for a distance of 17 feet. The remaining portion (above and beyond the end of the wall) of the shared boundary is open and traversed by pipes and conduits.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that one train of Emergency Feedwater components will remain free of fire damage in fire area IB-95-200.

- o The automatic ionization detection system will provide early warning of fire in the area,
- o Automatic sprinklers to control or suppress a fire will be installed,
- o The eight foot high, two foot thick reinforced concrete wall separating redundant components provides an effective fire barrier,

- o One train of redundant cables will be protected with a 1-hour fire barrier.
- o The fire loading for the fire area IB-95-200 corresponds to a fire severity, on the ASTM E-119 time-temperature curve of less than 25 minutes.

E. CONCLUSION

The installed and planned fire protection features (ionization detectors, automatic sprinklers and 1-hour cable tray enclosures) combined with the existing configuration and intervening wall provide reasonable assurance that one train of hot shutdown equipment in the area will remain free of fire damage.

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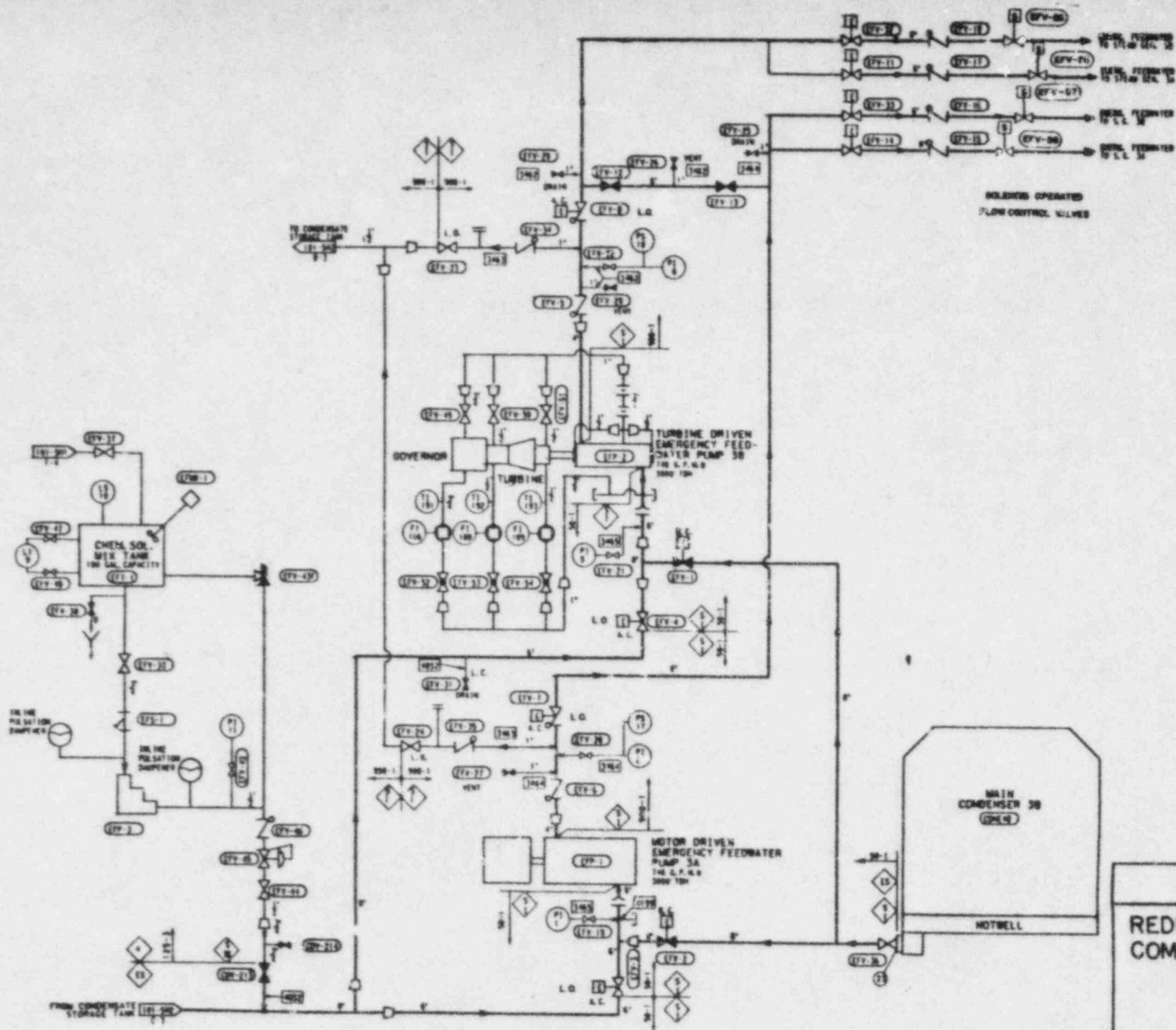
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FIGURE I-3
REDUNDANT SHUTDOWN
COMPONENT FUNCTION
FIRE ZONES:

IB-95-200A
IB-95-200B

EXEMPTION REQUEST #2

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.2, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirements to separate redundant safe shutdown components, located in the same fire area, with a rated fire barrier.

The fire area is AB-95-3, on the 95 foot elevation of the Auxiliary Building. This exemption request applies to the separation of the redundant Nuclear Services Closed Cycle Cooling System (SW) pumps, Nuclear Services Seawater System (RW) pumps, Decay Heat Closed Cycle Cooling System (DC) pumps and Air Handling Fans located in a smaller fire zone within this fire area. (See Figures 2-1 & 2-2).

B. REDUNDANT SAFE SHUTDOWN COMPONENTS/CIRCUITS IN FIRE ZONE AB-95-3Z

HOT SHUTDOWN COMPONENTS

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|------------------------------------------------------------------|--------------|----------------|
| Emergency Nuclear Services Seawater Pump 3A | A | RWP-2A |
| Emergency Nuclear Services Seawater Pump 3B | B | RWP-2B |
| Emergency Nuclear Services Closed Cycle Cooling Water Pump 3A | A | SWP-1A |
| Emergency Nuclear Services Closed Cycle Cooling Water Pump 3B | B | SWP-1B |

The Emergency Nuclear Services Seawater Pumps (RWP-2A and RWP-2B) supply cooling water from the Plant intake canal to the Nuclear Services closed cycle cooling water heat exchangers. The pumps supply the heat exchangers through a common header so either pump can serve all required cooling loads.

The Emergency Nuclear Services closed cycle cooling water pumps (SWP-1A and SWP-1B) utilize a closed cooling loop to transfer heat from essential components to the ultimate heat sink through the Nuclear Services closed cycle cooling water heat exchangers. The hot shutdown components cooled by this system are the motor driven emergency feedwater pump motor, the makeup and purification pumps, the Reactor Building air coolers, the Control Complex air coolers, the Nuclear Services seawater pump motors, and its own pump motors. The pumps supply the heat exchangers through a common header so either pump can serve all the listed hot shutdown components.

COLD SHUTDOWN COMPONENTS

| <u>COMPONENT</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|---------------------------------------------------------------------|--------------|----------------|
| Decay Heat Service Seawater Pump 3A | A | RWP-3A |
| Decay Heat Service Seawater Pump 3B | B | RWP-3B |
| Decay Heat Closed Cycle Cooling Water Pump 3A* | A | DCP-1A |
| Decay Heat Closed Cycle Cooling Water Pump 3B* | B | DCP-1B |
| Decay Heat Closed Cycle Cooling Water Pump Air Handling System** | A | AHF-15A |
| Decay Heat Closed Cycle Cooling Water Pump Air Handling System** | B | AHF-15B |

* Protection other than sprinkler coverage from loss of these pumps is not provided. Repair or replacement of one pump can be achieved within 72 hours of a fire with dedicated spare parts maintained on site.

** Temporary portable air handling equipment will be used if these components are unavailable.

The decay heat service seawater pumps (RWP-3A and RWP-3B) supply cooling water from the Plant intake canal to the decay heat closed cycle heat exchangers. The decay heat closed cycle cooling water pumps (DCP-1A and DCP-1B) transfer heat from the decay heat removal heat exchangers, the decay heat pump motors, the decay heat pump air handling unit, and the decay heat service seawater pump motor to the ultimate heat sink through the decay heat closed cycle heat exchangers.

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

The Fire Zone, in the southwest corner of the Auxiliary Building, is comprised of two rooms arranged in an "L" configuration. The boundaries for the zone are the Auxiliary Building exterior walls (below grade) on the west and south, the reinforced concrete Reactor Coolant Bleed Tank Room wall on the east and the Reactor Building Penetration Area on the north. (See Figure 2-2.) The ceiling and floor in this Fire Zone are constructed of reinforced concrete, with no rooms above or below.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that at least one train of safe shutdown components will remain free of fire damage in Fire Zone AB-95-3Z.

- o The zone is provided with an early warning ionization detection system which alarms locally and in the continuously manned Control Room.

- o Installation of a wet pipe sprinkler system designed to meet the objectives of NFPA Standard No. 13, (1983) for an Ordinary Hazard, Group II Occupancy Classification is planned.
- o One train of redundant cables in the zone will be enclosed in a 1-hour rated fire barrier.
- o The fire loading is very low for Fire Zone AB-95-3Z and corresponds to a fire severity on the ASTM E-119 time-temperature curve of 12 minutes.
- o A Manual Suppression System and Portable Extinguishers are available in the zone.
- o Protection from the loss of both trains of Nuclear Services Water (RW & SW) to a single fire is provided by the existing separation of redundant components and physical configuration of the room.

E. CONCLUSION

The installed and planned fire protection features (ionization detectors, automatic sprinklers, 1-hour cable tray enclosures, manual hose stations and portable extinguishers) combined with the low combustible loading and existing configuration provides reasonable assurance that one train of shutdown equipment in this zone will remain free of fire damage.

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EXEMPTION REQUEST #3

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.2, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirements to provide a 3-hour barrier to separate fire areas containing redundant safe shutdown equipment.

The fire areas are AB-95-3, the 95 foot elevation of the Auxiliary Building and AB-119-6, the 119 foot elevation of the Auxiliary Building. This exemption request applies only to the separation of the 95 foot elevation from the 119 foot elevation at the open stairway connecting zones AB-95-3B and AB-119-6A, in the northeast corner of the Auxiliary Building. (Figures 3-1 and 3-2)

B. REDUNDANT SAFE SHUTDOWN COMPONENTS/CIRCUITS IN FIRE ZONES

AB-95-3B and AB-119-6A

The two fire areas involved are very large, comprising two levels of the Auxiliary Building. These two large areas contain components or cables for most safe shutdown systems. However, the fire zones in the immediate vicinity of the stair opening (Fire Zones AB-95-3B and AB-119-6A) contain A and B train shutdown cables only and no components.

1.

Fire Zone AB-95-313

Safe Shutdown System Circuits

| <u>SYSTEM</u> | <u>CABLES*</u> | <u>TRAIN</u> |
|---------------------------------------|----------------|--------------|
| Electrical Power Distribution | P | A, B |
| Air Handling | C | B |
| Emergency Feedwater | C | B |
| Makeup and Purification | P, C | A, B |
| Nuclear Services Seawater | P | A, B |
| Nuclear Services Closed Cycle Cooling | P, C | A, B |
| Decay Heat Removal | P, C | A, B |
| Decay Heat Services Seawater | P | A, B |
| Auxiliary Steam | C | B |

2.

Fire Zone AB-119-6A

Safe Shutdown System Circuits

| <u>SYSTEM</u> | <u>CABLES*</u> | <u>TRAIN</u> |
|-------------------------------|----------------|--------------|
| Electrical Power Distribution | P, C | A, B |
| Air Handling | P, C | A, B |
| Decay Heat | C | B |
| Emergency Feedwater | C, I | A, AB |
| Makeup & Purification | P, C | A, B, AB |
| Reactor Coolant | C | AB |
| Secondary Plant | I | A |
| Condensate | I | A |

-
- * P = Power
C = Control
I = Instrumentation

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

Fire Zone AB-95-3B

Fire Zone AB-95-3B is a hallway which runs the length of the Auxiliary Building north end on the 95 foot elevation. There is an open stairway at the east end of the hallway which leads up to the 119 foot elevation. The zone is bounded by an exterior wall (below grade), with no penetrations, on the east and reinforced concrete walls on the north, south, and west. An HVAC duct penetrates the north wall. The duct will be equipped with a 3-hour rated fire damper. There are openings to adjacent fire zones to the south at the east and west ends of the hall. There are two additional doorways providing access to the zone; they are protected with 3-hour rated doors or doors of equivalent construction. The ceiling and floor are constructed of reinforced concrete. (See Figure 3-1 for location and layout of the zone.)

Fire Zone AB-119-6A

Fire Zone AB-119-6A is a hallway which runs the length of the Auxiliary Building north end on the 119 foot elevation. There is an open stairway at the east end of the hallway which leads down to the 95 foot elevation. The zone is bounded by 3-hour rated walls on the north, east, and west. The south wall is reinforced concrete with unsealed penetrations. There are openings to adjacent fire zones to the south in the east and west ends of the hall. The ceiling and floor are constructed of reinforced concrete. (See Figure 3-2 for location and layout of this zone.)

Other ceiling/floor penetrations between these two zones will be sealed.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that at least one train of safe shutdown components will remain free of fire damage in either of these areas and that fire will not propagate from safe shutdown cables in one area to safe shutdown cables in the other.

- o A wet pipe sprinkler system designed to meet the objectives of NFPA Standard No. 13 (1983) for an Ordinary Hazard, Group II Occupancy Classification will be provided on each level in these zones.
- o Draft stops in combination with closely spaced sprinklers will be designed and installed at the stairway opening which will meet the objectives of NFPA Standard No. 13 (1983), Section 4.4.8.2.3.
- o Automatic ionization detectors are installed in both areas, which alarm locally and in the continuously manned Control Room providing early warning of fire to aid manual fire fighting activities.
- o One train of functionally redundant shutdown cables in each zone will be enclosed in approved 1-hour rated barriers.
- o 1-hour rated fire barriers will be provided for the vertical space defined by the stairwell opening, and for 10 feet horizontally from the opening for cables with unprotected functionally redundant counterparts.

- o The fire loading for fire zone AB-119-6A (the upper elevation) corresponds to a fire severity on the ASTM E-119 time-temperature curve of 4.6 hours. This is a very conservative value based on the assumptions given in the attached general information.
- o The fire loading for fire zone AB-95-3B (the lower elevation) corresponds to a fire severity on the ASTM E-119 time-temperature curve of 1.6 hours.
- o Access to each zone is available from multiple points to allow choice of the most effective fire fighting strategy.
- o Hose stations and portable fire extinguishers are available for use in both zones.

E. CONCLUSION

The installed and planned fire protection features (automatic fire suppression systems, ionization detectors, 1-hour rated cable enclosures, hose stations and portable fire extinguishers) provide reasonable assurance that fire will not propagate from one fire area to the other, and that one train of safe shutdown equipment will remain free of fire damage.

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EXEMPTION REQUEST #4

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.2, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirements to separate redundant hot shutdown components, located in the same fire area, with rated fire barriers.

The fire area is AB-95-3 on the 95 foot elevation of the Auxiliary Building. This exemption request applies to separation of the redundant makeup pumps and their supporting lubrication oil pumps located in adjacent fire zones within Fire Area AB-95-3 (See Figure 4-1.)

B. REDUNDANT HOT SHUTDOWN COMPONENTS/CIRCUITS IN FIRE ZONES AB-95-3E,
AB-95-3AA AND AB-95-3F

Fire Zone AB-95-3E

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|---------------------------|--------------|----------------|
| Makeup Pump 3A | A | MUP-1A |
| Main Lube Oil Pump (AC) | A | MUP-2A |
| Backup Lube Oil Pump (DC) | A | MUP-3A |
| Main Gear Oil Pump (AC) | A | MUP-4A |
| Backup Gear Oil Pump (DC) | A | MUP-5A |

Fire Zone AB-95-3AA

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|---------------------------|--------------|----------------|
| Makeup Pump 3B | A,B | MUP-1B |
| Main Lube Oil Pump (AC) | AB | MUP-2B |
| Backup Lube Oil Pump (DC) | A,B | MUP-3B |
| Main Gear Oil Pump (AC) | AB | MUP-4B |
| Backup Gear Oil Pump (DC) | A,B | MUP-5B |

Fire Zone AB-95-3F

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|---------------------------|--------------|----------------|
| Makeup Pump 3C | B | MUP-1C |
| Main Lube Oil Pump (AC) | B | MUP-2C |
| Backup Lube Oil Pump (DC) | B | MUP-3C |
| Main Gear Oil Pump (AC) | B | MUP-4C |
| Backup Gear Oil Pump (DC) | B | MUP-5C |

The Makeup Pumps (MUP-1A, MUP-1B, and MUP-1C) supply motive force to the makeup system which controls reactor coolant inventory. Each pump provides 100% capacity to perform these functions. Makeup pump MUP-1B can be powered and controlled by either A or B Train hot shutdown circuits. The remaining pumps in these zones (MUPs 2A-5A, 2B-5B, and 2C-5C) supply lubrication to the three makeup pumps and gear drivers.

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

The three fire zones are adjacent rooms located in the northwest corner of the Auxiliary Building on the 95 foot elevation (see Figure 4-1). The makeup pump area is enclosed by reinforced concrete walls with offset doorways at the northeast and southeast corners. The makeup pump area is divided into three smaller rooms by

reinforced concrete walls which extend from the west boundary wall eastward to within 3 feet of the east boundary wall. (Each smaller room contains a single makeup pump and its supporting lube oil and gear oil pumps.) There is communication between the adjacent zones at the eastern end of the dividing walls. (See Figure 4-2 for equipment arrangement in each zone). The ceilings in zones AB-95-3AA and AB-95-3F are 3-hour rated. The ceiling in zone AB-95-3E is constructed of reinforced concrete with penetrations to the floor above. The penetrations will be sealed. Ventilation exhaust ducts in these zones will be equipped with 3-hour rated dampers. A single cable tray traverses all three zones. The cable tray penetrations will be sealed at the zone boundaries.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that at least one train of redundant makeup system pumps will remain free of fire damage following a fire in any of these zones.

- o The zones will be provided with an early warning ionization detection system which will alarm locally and in the continuously manned Control Room.
- o Substantial pump separation, enhanced by the reinforced concrete dividing walls, is provided by the physical arrangement of the equipment and the rooms.
- o The fire loading for the three zones is very low. The combined fire loading for the zones corresponds to a fire severity on the ASTM E-119 time-temperature curve of 5 minutes.

- o Manual suppression systems and portable extinguishers are available in adjacent zones.
- o An extra level of redundancy is provided by the three, 100% capacity makeup pumps.

E. CONCLUSION

The installed and planned fire protection features (ionization detectors, existing separation, intervening reinforced concrete walls, manual hose stations and portable extinguishers) combined with the low combustible loading provides reasonable assurance that at least one train of hot shutdown equipment, in these zones, will remain free of fire damage.

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EXEMPTION REQUEST #5

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.2, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirements to separate redundant hot shutdown components, located in the same fire area, with a rated fire barrier. The fire area is AB-95-3, on the 95 foot elevation of the Auxiliary Building which contains fire zone AB-95-3C. This exemption request applies to the separation of makeup system valves, which are located in the zone and provide redundant makeup flow paths.

B. REDUNDANT HOT SHUTDOWN COMPONENTS/CIRCUITS IN FIRE ZONE AB-95-3C

| <u>COMPONENT/CIRCUIT</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|----------------------------|--------------|----------------|
| Makeup System Valve | B | MUV-23 |
| Makeup System Valve | B | MUV-25 |
| Makeup System Valve A | MUV-27 | |

The function of the Makeup System valves (MUV-23, MUV-25, and MUV-27) is to provide redundant flow paths to loops A and B of the Reactor Coolant System from the makeup pumps.

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

The fire zone is a hallway bounded on the west by the Reactor Building and a reinforced concrete Auxiliary Building wall on the east. The north, northeast, and south portions of the zone are open to adjacent fire zones. (See Figure 5-1). The floor of this zone is constructed of reinforced concrete with no rooms below it, except in the south portion of the zone. This portion of the zone contains a covered hatchway which leads to the A decay heat pit. The portion of the hatchway in the zone is covered by precast concrete shield blocks. The ceiling is reinforced concrete with two small openings to the 119 foot elevation. The openings will be sealed. The equipment arrangement in this zone is provided in Figure 5-2.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that at least one train of makeup supply will remain free of fire damage in Fire Zone AB-95-3C.

- o The zone is provided with an early warning smoke detection system which alarms locally and in the continuously manned Control Room.
- o Installation of a wet pipe sprinkler system designed to meet the objectives of NFPA Standard No. 13 (1983) for an Ordinary Hazard, Group II Occupancy Classification.
- o All conduit in Fire Zone AB-95-3C associated with redundant valve, MUV-27, will be wrapped with an approved 1-hour fire barrier.

- o The fire loading is very low for Fire Zone AB-95-3C and corresponds to a fire severity on the ASTM time-temperature curve of less than 2 minutes.
- o A manual hose station is located immediately adjacent to the zone and a portable extinguisher is located within the zone.

E. CONCLUSION

The installed and planned fire protection features (ionization detectors, automatic sprinklers, 1-hour conduit wrap, a manual hose station and a portable extinguisher) combined with the low combustible loading provides reasonable assurance that one train of hot shutdown equipment in the zone will remain free of fire damage.

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EXEMPTION REQUEST #6

A. EXEMPTION REQUEST

Florida Power Corporation (FPC) requests exemption from certain technical requirements of 10 CFR 50, Appendix R, Section III.G.3, at Crystal River Unit 3 (CR-3). Specifically, exemption is requested from the requirement to provide a fixed suppression system in the HVAC area of the Control Complex (Fire Area CC-164-121).

The fire area, CC-164-121, is located on the 164 foot elevation of the Control Complex. This area contains both A and B train control complex HVAC equipment. An alternate system for removing hot shutdown equipment heat loads in the Control Complex is being provided. The alternate HVAC system is located outside of this fire area.

B. REDUNDANT SAFE SHUTDOWN COMPONENTS/CIRCUITS IN FIRE AREA

CC-164-121

This fire area contains the HVAC equipment for the control complex which provides cooling for hot shutdown equipment in the Control Room, cable spreading room, essential switchgear rooms, battery rooms, and inverter rooms. Specific equipment for hot and cold shutdown located in this fire area is listed below.

| <u>COMPONENT/CIRCUITS</u> | <u>TRAIN</u> | <u>TAG NO.</u> |
|--------------------------------------------|--------------|----------------|
| Control complex normal air supply fans | A,B | AHF-17A,B |
| Control complex return air fans | A,B | AHF-19A,B |
| Water chillers | A,B | CHHE-1A,B |
| Control complex emergency supply fans | A,B | AHF-18A,B |
| Control complex emergency charcoal filters | A,B | AHFL-4A,B |
| Control complex chilled water pumps | A,B | CHP-1A,B |

C. PHYSICAL DESCRIPTION OF AFFECTED AREA

Fire area CC-164-121 occupies almost the entire floor at the 164 foot elevation of the Control Complex. (See Figure 6-1.) The remainder of the floor is occupied by the Control Complex elevator and stairwell and a small vestibule. The area is bounded by 3-hour rated or exterior walls on all four sides with an equivalent A rated fire door opening to the vestibule. This area is the highest elevation of the Control Complex and no shutdown equipment exists on the Control Complex roof. The floor and dampers in ventilation ducts (penetrating the floor) will be 3-hour rated. The elevation below is occupied by the plant Control Room, Instrument Shop, and offices.

The area consists of four fire zones as indicated on Figure 6-1. Fire zones CC-164-121B and CC-164-121C are of similar configuration and house the filter units. Reinforced concrete walls for radiation shielding enclose each filter unit and are constructed with an offset doorway. The equipment arrangement in the area is shown in Figure 6-2.

D. JUSTIFICATION FOR PROPOSED EXEMPTION

The following information shows that the level of protection provided will ensure that an HVAC system will remain free of fire damage and fire cannot spread beyond the boundaries of this fire area.

- o An area wide early warning ionization detection system which alarms locally and in the control room is installed.
- o Fixed water spray systems are provided for the charcoal filter banks . (The charcoal filter banks are the major combustible load in this Fire Area.)
- o Combustible loading for this area corresponds to an ASTM E-119 curve fire severity level of less than 13 minutes.
- o Loss of the Control Complex HVAC system will not adversely affect the safe shutdown capability at CR-3 because a alternate ventilation cooling system is being provided for Control Complex areas required for safe shutdown of the plant.
- o The Fire Area is completely bounded by 3-hour rated barriers.

E. CONCLUSION

The installed and planned fire protection features (ionization detection and spray systems for the charcoal filters) combined with the low combustible loading, 3-hour fire barriers in the area and the proposed alternate ventilation cooling system for the Control Complex ensure that one train of HVAC will remain available for safe shutdown and that fire will not spread beyond this fire area.

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EVALUATION OF DECAY HEAT PUMP PROTECTION

A. PURPOSE

The purpose of this evaluation is to show that adequate separation or protection exists, and assures that the redundant decay heat pumps, DHP-1A and DHP-1B (cold shutdown components) will not be lost to a single fire anywhere in the plant. This will relieve Florida Power Corporation of the need to maintain a dedicated spare pump, on-site, specifically for complying with Appendix R requirements.

B. REQUIREMENT

10 CFR 50, Appendix R, paragraph II.G.1.b states:

"Fire protection features shall be provided for structures, systems, and components important to safe shutdown. These features shall be capable of limiting fire damage so that;"

"Systems necessary to achieve and maintain cold shutdown from the Control Room or emergency control station(s) can be repaired within 72 hours."

Specific fire protection features necessary to achieve this goal are not specified by Appendix R.

C. DESCRIPTION

The redundant decay heat pumps are located in individual, adjacent rooms (decay heat pits) separated by a 3-hour rated barrier on the 75 foot elevation of the Auxiliary Building (Fire Zones AB-75-4 and AB-75-5). Each decay heat pit has a hatchway open to a common fire area, AB-95-3 (95 foot elevation of the Auxiliary Building). The hatchways are approximately 50 feet apart without a rated fire barrier separating them. The decay heat pumps are powered by independent ES switchgear units. (See Figure E-1 for area location.)

D. ANALYSIS

1) SPREAD OF FIRE BETWEEN HATCHWAYS

The open hatchways are located approximately 50 feet apart, around a corner from each other, in the main corridor of the Auxiliary Building 95 foot elevation. The hatchways are surrounded by 24 inch high curbs. The spatial separation and the low combustible loading in the area makes it unlikely that a single fire could involve both hatchways. The curbs around the openings provide additional protection by assuring that liquid combustibles will not enter the pits from a spill above. There will also be automatic sprinklers installed through this area of the 95 foot elevation of the Auxiliary Building which will suppress or limit the spread of fire between the two hatchways.

In addition to the automatic suppression system, there are ionization detectors and manual fire fighting equipment in the vicinity.

Combination of the above features provides assurance that a single fire on the 95 foot elevation of the Auxiliary Building is extremely unlikely to spread between the two decay heat pit hatchways and affect operability of the decay heat pumps.

2) PROTECTION OF CIRCUITS FROM FIRE

The circuits supplying both decay heat pumps leave the decay heat pits and traverse the 95 foot elevation of the Auxiliary Building to the Control Complex. The "B" train decay heat circuits will be enclosed in an approved 3-hour rated fire barrier for its entire transit of the 95 foot elevation of the Auxiliary Building, and at least one of the redundant trains will be provided with similar protection in the Control Complex. This protection provides reasonable assurance that power to both pumps will not be lost to a single fire in the plant.

3) EFFECT OF FIRE IN ONE DECAY HEAT PIT ON ADJACENT DECAY HEAT PIT

The decay heat pumps are located below grade and are entirely enclosed by reinforced concrete walls. The floors and ceilings are also constructed of reinforced concrete. The pits are separated from each other by a reinforced concrete wall. All penetrations in the common wall will be sealed.

The only shutdown equipment in either pit, that cannot be manually operated, is the decay heat pump. (See Figure E-2 for equipment location.)

The Table below presents the combustible loading and fire characteristics of each of the pits.

Fire Zone AB-75-5, "A" Decay Heat Pit

| | |
|-------------------------------------|-----------------|
| Zone Size: | 2193 sq. ft. |
| Combustible Loading | |
| Oil & Grease | 1.5 gal. |
| Cable Insulation | 2278 lbs. |
| Fire Loading | 5271 BTU/sq.ft. |
| Heat Rate | E/850°F |
| ASTM E-119 Equivalent Fire Severity | 8 min. |

Fire Zone AB-75-4, "B" Decay Heat Pit

| | |
|-------------------------------------|-----------------|
| Zone Size: | 1733 sq. ft. |
| Combustible Loading | |
| Oil & Grease | 1.5 gal. |
| Cable Insulation | 718 lbs. |
| Fire Loading | 3708 BTU/sq.ft. |
| Heat Rate | E/725°F |
| ASTM E-119 Equivalent Fire Severity | 6 min. |

The fire characteristics of these zones are sufficiently minimal to conclude that the reinforced concrete wall with rated seals, separating the two decay heat pits, provides adequate separation.

E. CONCLUSION

The fire protection features described above provide assurance that both decay heat pumps will not be damaged by a single fire. It is our position that the requirements of Appendix R are met, and it is not necessary to maintain spare parts or establish repair/replacement procedures for the decay heat pumps, or provide additional protection over that already specified.

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SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #1

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE IB-95-200A
MOTOR DRIVEN EFW PUMP ROOM
ELEVATION: 95 FT., INTERMEDIATE BUILDING
SIZE: 1188 Sq. Ft.

Combustibles:

Oil and Grease 21 gal.

Fire Loading 2347 BTU/sq.ft.

Heat Rate E/500 °F

ASTM E-119 Equivalent Fire Severity 2 min.

Fire Protection

Suppression (Type) Wet pipe sprinkler (planned)

FIRE ZONE IB-95-200B
TURBINE DRIVEN EFW PUMP ROOM
ELEVATION: 95 FT., INTERMEDIATE BUILDING
SIZE: 1769 Sq. Ft.

Combustibles:

| | |
|------------------|------------|
| Oil and Grease | 2 gal. |
| Cable Insulation | 11,299 lb. |

| | |
|--------------|--------------------|
| Fire Loading | 54,710 BTU/sq. ft. |
|--------------|--------------------|

| | |
|-----------|----------|
| Heat Rate | E/1625°F |
|-----------|----------|

| | |
|-------------------------------------|---------|
| ASTM E-119 Equivalent Fire Severity | 41 min. |
|-------------------------------------|---------|

Fire Protection

| | |
|--------------------|------------------------------|
| Suppression (Type) | Wet pipe sprinkler (planned) |
|--------------------|------------------------------|

| | |
|------------------|------------|
| Detection (Type) | Ionization |
|------------------|------------|

2. ANALYSIS

The maximum severity fire for zone IB-95-200A is a fast burning fire that could create an ultimate room temperature of 500°F. This fire is conservatively based on the simultaneous combustion of all combustibles in the zone.

The maximum severity fire for zone IB-95-200B is a slow burning fire that could create an ultimate room temperature of 1625°F, and would involve cable insulation and oil. This fire is conservatively based on the simultaneous combination of all combustibles in the zone.

Figure 1-2 shows the approximate location of redundant components in the area. Figure 1-3 shows the function of the listed redundant components.

Access to the area is available from two directions as is evident in Figure 1-2. This configuration provides the opportunity for manual fire suppression activities for a fire in either zone, in a manner which would be most effective in assuring redundant components are not damaged.

The concrete wall which separates the redundant emergency feedwater pumps provides an effective barrier to fire propagation from components in one zone to components in the other. Since the most likely source of a fire in the area would be one of the emergency feedwater pumps, the wall separating the pumps provides an effective shield for the redundant pumps and valves.

Construction of a rated fire barrier to enclose one or the other sets of redundant Emergency Feedwater components would be impractical due to obstructions in the area, and would not significantly increase the level of protection provided by the existing wall.

SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #2

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE AB-95-3Z
SEAWATER PUMP ROOM
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 8959 Sq. Ft.

Combustibles:

| | |
|------------------|---------------------------------|
| Oil and Grease | 72 gal. (contained in 12 pumps) |
| Cable Insulation | 16,416 lb. |
| Class A | 80 lbs. |

| | |
|-------------------------------------|-------------------|
| Fire Loading | 16,798 BTU/sq.ft. |
| Heat Rate | E/1325°F |
| ASTM E-119 Equivalent Fire Severity | 12 min. |

Fire Protection

| | |
|--------------------------------------|-------------------------------|
| Suppression (Type) | Wet Pipe Sprinklers (planned) |
| Detection (Type) | Ionization |
| Hose Stations (Number) | 1 |
| Portable Extinguishers (Type/Number) | ABC/2 |

2. ANALYSIS

The maximum severity fire in this zone is a fast burning fire that could create an ultimate room temperature of 1325°F. This fire is conservatively based upon the simultaneous combustion of all combustibles in the zone. Planned wrapping of cable trays with fire resistant barriers will further reduce the combustible loading in the zone.

Figure 2-1 shows the arrangement of redundant components in the area. The minimum separation between redundant SW pumps (SWP-1A and SWP-1B) is approximately 10 feet.

The minimum separation between redundant RW pumps (RWP-2A and RWP-2B) is approximately 20 feet.

The low combustible loading in this zone and high ceiling, combined with the spatial separation of redundant components and circuits provides effective defense against the loss of both trains of RW or SW pumps to a single fire. In addition to the separation of the pumps, automatic fire detection equipment which alarms in the continuously manned Control Room, portable extinguishers and a manual fire hose station are installed in the vicinity. Construction of a rated fire wall to separate the redundant pumps would not significantly increase the level of protection afforded by the existing separation, detection and suppression systems.

SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #3

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE AB-95-3B
NORTHEAST HALLWAY
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 1021 Sq. FT.

Combustibles:

| | |
|------------------|-------------|
| Cable Insulation | 10,803 lbs. |
| Class A | 3,110 lbs. |
| Plastics | 400 lbs. |
| Miscellaneous | 300 lbs. |

| | |
|-------------------------------------|--------------------|
| Fire Loading | 127,176 BTU/sq.ft. |
| Heat Rate | E/1900°F |
| ASTM E-119 Equivalent Fire Severity | 1.6 hr |

Fire Protection

| | |
|--------------------------------------|-------------------------------|
| Suppression (Type) | Wet Pipe Sprinklers (planned) |
| Detection (Type) | Ionization |
| Hose Stations (Number) | 1 |
| Portable Extinguishers (Type/Number) | ABC/2 |

FIRE ZONE AB-119-6A
NORTHEAST HALLWAY
ELEVATION: 119 FT., AUXILIARY BUILDING
SIZE: 918 Sq. Ft.

Combustibles:

| | |
|------------------|-------------|
| Cable Insulation | 37,162 lbs. |
| Class A | 150 lbs. |
| Plastics | 400 lbs. |
| Miscellaneous | 400 lbs. |

| | |
|-------------------------------------|--------------------|
| Fire Loading | 364,237 BTU/sq.ft. |
| Heat Rate | E/1875°F |
| ASTM E-119 Equivalent Fire Severity | 4.6 hr |

Fire Protection

| | |
|--------------------------------------|-------------------------------|
| Suppression (Type) | Wet Pipe Sprinklers (planned) |
| Detection (Type) | Ionization |
| Hose Stations (Number) | 1 |
| Portable Extinguishers (Type/Number) | ABC/1 |

2. ANALYSIS

The maximum severity fire in each of these zones is a fast burning fire that could create an ultimate room temperature of 1900°F. These fires are conservatively based on the simultaneous combustion of all combustible materials in the area.

Each of the zones is equipped with ionization type smoke detectors which alarm in the continuously manned Control Room to provide early warning of an incipient fire. Manual fire fighting equipment is available in or immediately adjacent to each zone, and each zone is accessible through multiple routes to facilitate manual fire fighting.

The combustible materials in these zones are not concentrated near the stairwell.

- o This area provides the main point of access to the Auxiliary Building; erection of a physical barrier around the stairway would interfere with movement of equipment and personnel between plant levels.
- o A fire wall enclosing the stairwell may produce detrimental effects on the balanced Auxiliary Building ventilation system which is designed to sweep air from areas of low radioactive contamination potential to areas of high contamination potential.

Additionally, construction of a rated fire wall around the stairway would not significantly increase the level of protection provided by existing systems when combined with the proposed modifications.

SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #4

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE AB-95-3E
"A" MAKEUP PUMP ROOM
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 412 Sq. Ft.

Combustibles:

Oil and Grease 19 gal.

Fire Loading 6124 BTU/sq.ft.

Heat Rate E/900°F

ASTM E-119 Equivalent Fire Severity 4.2 min.

Fire Protection

Detection (Type) ionization (planned)

Hose Stations (Number) 2 (immediately adjacent to zone)

Portable Extinguishers (Type/Number) ABC/4 (immediately adjacent to zone)

FIRE ZONE AB-95-3AA
"AB" MAKEUP PUMP ROOM
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 350 Sq. Ft.

Combustibles:

Oil and Grease 19 gal.

Fire Loading 7209 BTU/sq.ft.

Heat Rate E/950°F

ASTM E-119 Equivalent Fire Severity 5.4 min.

Fire Protection

Detection (Type) ionization (planned)

Hose Stations (Number) 2 (immediately adjacent to zone)

Portable Extinguishers (Type/Number) ABC/4 (immediately adjacent to zone)

FIRE ZONE AB-95-3F
"B" MAKEUP PUMP ROOM
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 362 Sq. Ft.

Combustibles:

Oil and Grease 19 gal.

Fire Loading 6970 BTU/sq.ft.

Heat Rate E/950°F

ASTM E-119 Equivalent Fire Severity 4.8 min.

Fire Protection

Detection (Type) ionization (planned)

Hose Stations (Number) 2 (immediately adjacent to zone)

Portable Extinguishers (Type/Number) ABC/4 (immediately adjacent to zone)

2. ANALYSIS

The maximum severity fires for zones AB-95-3E, AB-95-3AA and AB-95-3F are fast burning fires that could create ultimate room temperatures of 900°F, 950°F, and 950°F, respectively. These fires are conservatively based on the simultaneous combustion of all combustible materials in each zone.

Figure 4-2 shows the arrangement of the fire zones and their contained equipment. As shown, substantial separation exists between the pumps. This separation is enhanced by the walls between the pumps. It is highly unlikely that a fire in one zone could affect equipment or circuits in an adjacent zone due to the combination of low combustible loading and existing separation between equipment. This is especially true when the maximum severity fire characteristics are considered. In addition to the existing separation, each of the three zones will be equipped with ionization type smoke detectors which alarm locally and in the continuously manned Control Room. Fire hose stations and portable extinguishers are available adjacent to the fire zones and access to the zones is available via two routes to aid in fire fighting activities.

These characteristics and the level of redundancy provided by three 100% capacity pumps combine to provide reasonable assurance that a makeup water supply will be available to achieve and maintain hot shutdown conditions following a fire in any one of these zones.

Erection of rated physical barriers to provide separation of these pumps, in accordance with the criteria of Appendix R, would interfere with the ability to access or remove these pumps for operations, maintenance or repair.

SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #5

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE AB-95-3C
WEST HALLWAY
ELEVATION: 95 FT., AUXILIARY BUILDING
SIZE: 901 Sq. Ft.

Combustibles:

Plastics 30 lbs.

Fire Loading 399 BTU/sq.ft.

Heat Rate E/475°F

ASTM E-119 Equivalent Fire Severity less than 2 min.

Fire Protection

Suppression (Type) Wet Pipe Sprinklers (planned)

Detection (Type) Ionization

Hose Stations (Number) 1 (immediately adjacent to zone)

Portable Extinguishers (Type/Number) ABC/1

2. ANALYSIS

The maximum severity fire in this zone is a fast burning fire that could create an ultimate room temperature of 475°F. This fire is conservatively based upon the simultaneous combustion of all combustibles in the zone.

The extremely low combustible loading in the zone and the wrapping of all conduit associated with MUV-27 with a 1-hour fire barrier provides an effective defense against the loss of both trains of makeup system block valves. In addition, automatic fire suppression and detection equipment, a portable extinguisher and a manual fire hose station are installed in the vicinity. Construction of a rated fire wall to separate the redundant block valves would not significantly increase the level of protection afforded by the existing separation, detection, and suppression systems.

SUPPLEMENTAL INFORMATION FOR EXEMPTION REQUEST #6

1. FIRE ZONE CHARACTERISTICS

FIRE ZONE CC-164-121
HVAC ROOM
ELEVATION: 164 FT., CONTROL COMPLEX
SIZE: 2866 Sq. Ft.*

Combustibles:

| | |
|------------------|-------------|
| Oil | 19 gal. |
| Cable Insulation | 548 lbs. |
| Charcoal | 15,840 lbs. |
| Class A | 1,669 lbs. |
| Miscellaneous | 250 lbs. |

| | |
|-------------------------------------|-------------------|
| Fire Loading | 8262 BTU/sq.ft.** |
| ASTM E-119 Equivalent Fire Severity | 13 min. |

Fire Protection

| | |
|--------------------------------------|----------------------------------------------|
| Suppression (Type) | Fixed Spray (Zones CC-164-121B, CC-164-121C) |
| Detection (Type) | Ionization |
| Portable Extinguishers (Type/Number) | ABC/3 |

* Less the charcoal filter rooms.

** Fire Load less the sprinklered charcoal filters.

2. ANALYSIS

The major combustible in this fire area is the charcoal filter media in zones CC-164-121B and CC-164-121C. The charcoal filters are housed in heavy gauge, closed, steel housings which are in turn enclosed behind the concrete shield walls extending from floor to ceiling. Each filter bank is protected by a fixed water spray system with spray heads mounted inside the steel filter housing. The fixed water spray systems are actuated by thermal detectors mounted inside the housings. The ventilation fans associated with each filter bank are not normally in service and are designed for emergency use. When not in use, the emergency system is automatically isolated from the normal system by ventilation dampers. This configuration assures that fire spread from the filter banks to the remainder of the area or from one filter bank to the other is highly unlikely.

Zone CC-164-121D is an office used by HVAC technicians on an 8 hour per day basis. A smoke detector is located just outside the zone for early warning of a fire, permitting rapid response for manual fire fighting.

Zone CC-164-121A is the remaining portion of the fire area. This zone is an open room with very low combustible loading. The combustibles in the zone are mainly lubricants housed in the closed water chillers, and exterior chiller insulation. These chillers are located on the opposite side of the room from the office with very low amounts of intervening combustibles. The chillers are separated from each other by approximately 6 feet. Since there are no pieces of equipment in the area except ventilation equipment and no other areas except the vestibule communicate with it, there is a very low probability for traffic or work involving significant transient combustibles or ignition sources.

The area is protected with smoke detectors which alarm locally and in the continuously manned Control Room, and provides open access for fire fighting activities.

Ventilation requirements for the Control Complex can be supplied by either the 100% capacity normal duty fan units or the 100% capacity emergency fan units in combination with the chiller units. All equipment is powered from on-site power sources.