



September 1, 1995

U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attn: Document Control Desk

Subject: Dresden Station Units 2 and 3  
Quad Cities Station Units 1 and 2  
**Proposed Scheduling Exemption for Commitments Related  
to 10 CFR 50.63, Station Blackout (SBO) Rule**  
NRC Docket Nos. 50-237/249 and 50-254/265

- References: (1) B.L. Siegel to T.J. Kovach letter dated December 11, 1990  
(2) L.N. Olshan to T.J. Kovach letter dated July 18, 1991

This letter transmits Commonwealth Edison Company's (ComEd's) request for NRC Staff approval of a one-time scheduling exemption from the requirements of 10 CFR 50.63, the "Station Blackout Rule," for Dresden Station and Quad Cities Station. This proposed scheduling exemption request is provided as an Attachment to this letter.

In order to meet the requirements of 10 CFR 50.63, ComEd committed to install two AAC-DGs at both Dresden and Quad Cities Stations by December 31, 1995. The NRC Staff reviewed and approved these commitments in the Reference (a) and (b) Safety Evaluations. The proposed scheduling exemption requests an additional 6 months (June 30, 1996) to complete the necessary electrical tie-ins and testing for one of two AAC-DGs at both Dresden and Quad Cities Stations.

ComEd has evaluated the current circumstances related to SBO modifications at Dresden and Quad Cities Stations and has determined that a one-time scheduling exemption from the requirements (and associated commitments) of 10 CFR 50.63 is appropriate under the current circumstances, based upon the criteria established in 10 CFR 50.12 (a)(1).

The proposed one-time scheduling exemption is necessary to safely complete the installation of electrical tie-ins and operability testing of the Dresden Unit 3 and Quad Cities Unit 1 AAC-DG systems during the scheduled refuel outages (D3R14 and Q1R14). These refuel outages are necessary in order to safely complete the remaining actions, due to the required configuration of the auxiliary electric system (i.e. consecutive and extended outages of both 4 kV safety buses for the applicable unit).

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The electrical tie-ins and operability testing activities were originally scheduled to be completed during D3R14 and Q1R14, with outage start dates during the Fall of 1995. These refuel outages were extended beyond 1995 due to unanticipated extensions of the previous refuel outages (D3R13 and Q1R13), and unplanned forced outages to implement improvement initiatives.

ComEd has evaluated the deterministic and probabilistic impact of the one-time schedular exemption upon the safety and health of the public, as well as the overall risk to nuclear safety. This evaluation has indicated that the proposed exemption does not present an undue risk to the public health and safety. This evaluation is described in the Attachment to this letter.

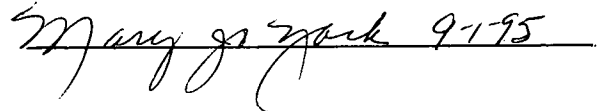
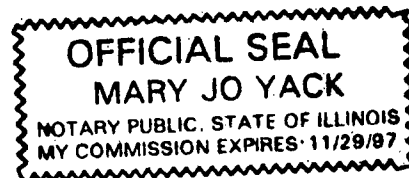
To the best of my knowledge and belief, the statements contained above are true and correct. In some respect these statements are not based on my personal knowledge, but obtained information furnished by other Commonwealth Edison employees, contractor employees, and consultants. Such information has been reviewed in accordance with Company practice, and I believe it to be reliable.

If there are any comments or questions pertaining to this exemption request, please direct them to this office.

Respectfully,



John L. Schrage  
Nuclear Licensing Administrator



Attachment: Proposed Schedular Exemption from 10 CFR 50.63, Station Blackout Rule; Dresden Station, Units 2 and 3 & Quad Cities Station, Units 1 and 2

cc: H.B. Miller, Regional Administrator - RIII  
J.F. Stang, NRR Project Manager - Dresden  
M.N. Leach, Senior Resident Inspector - Dresden  
R.M. Pulsifer, NRR Project Manager - Quad Cities  
C.G. Miller, Senior Resident Inspector - Quad Cities  
Office of Nuclear Facility Safety - IDNS

## Attachment

### Proposed Scheduler Exemption from 10 CFR 50.63 Station Blackout Rule Dresden Station, Units 2 and 3 & Quad Cities Station, Units 1 and 2

#### A. References

- (1) M.H. Richter to T.E. Murley letter dated April 17, 1989
- (2) M.H. Richter to T.E. Murley letter dated May 18, 1990
- (3) B.L. Siegel to T.J. Kovach letter dated December 11, 1990
- (4) M.H. Richter to T.E. Murley letter dated February 15, 1991
- (5) L.N. Olshan to T.J. Kovach letter dated July 18, 1991
- (6) M.H. Richter to T.E. Murley letter dated September 9, 1991
- (7) P.L. Piet to USNRC letter dated October 28, 1994

#### B. Proposed Exemption

Pursuant to 10 CFR 50.12 (a), ComEd is requesting a one-time scheduler exemption from the requirements of 10 CFR 50.63, the "Station Blackout Rule," for Dresden Station and Quad Cities Station.

In order to meet the requirements of 10 CFR 50.63, ComEd committed to install two AAC-DGs at both Dresden and Quad Cities Stations by December 31, 1995. The proposed scheduler exemption requests an additional 6 months (June 30, 1996) to complete the necessary electrical tie-ins and testing for one of two AAC-DGs at both Dresden and Quad Cities Stations.

A one-time scheduler exemption from the requirements (and associated commitments) of 10 CFR 50.63 is appropriate under the current circumstances, based upon the criteria established in 10 CFR 50.12 (a)(1). This regulation states that the Commission may grant exemptions from the requirements of the regulations of 10 CFR 50, which are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security. In addition, 10 CFR 50.12 (a)(2) states that the Commission will not grant an exemption from the regulations unless special circumstances are present. These special circumstances are defined in 10 CFR 50.12 (a)(2)(v), which stipulates that the requested exemption would provide only temporary relief from the applicable regulation and the licensee has made good faith efforts to comply with the regulations.

The proposed one-time scheduler exemption is necessary to safely complete the installation of electrical tie-ins and operability testing of the Dresden Unit 3 and Quad Cities Unit 1 AAC-DG systems during the scheduled refuel outages (D3R14 and Q1R14). These refuel outages are necessary in order to safely complete the remaining actions, due to the required configuration of the auxiliary electric system (i.e. consecutive and extended outages of both 4 kV safety buses for the applicable unit).

The electrical tie-ins and operability testing activities were originally scheduled to be completed during D3R14 and Q1R14, with outage start dates during the Fall of 1995. These refuel outages were extended beyond 1995 due to unanticipated extensions of the previous refuel outages (D3R13 and Q1R13), and unplanned forced outages to implement extensive management improvement initiatives.

ComEd has evaluated the deterministic and probabilistic impact of the one-time scheduler exemption upon the safety and health of the public, as well as the overall risk to nuclear safety. This evaluation has indicated that the proposed exemption does not present an undue risk to the public health and safety. This evaluation is described in Section F of this Attachment.

### C. Original ComEd Commitments to 10 CFR 50.63

In 1988, the NRC published the Station Blackout Rule (10 CFR 50.63). The rule required that each light water cooled nuclear power plant be able to withstand, for a specified duration, and recover from, a station blackout. The rule defined a station blackout as the loss of AC power to the essential and non-essential switchgear buses in the plant, resulting from the loss of all offsite and onsite power sources.

The rule provided two basic approaches for demonstrating compliance, through Coping or an Alternate AC (AAC) source. "Coping" was defined as the ability to achieve and maintain the plant in a safe shutdown condition, independent of AC power, for a specified period of time (dependent upon the site-specific off-site and onsite emergency power configuration). If the plant could not demonstrate compliance with the SBO rule through coping, an AAC source, independent from the normal Class 1E emergency AC power sources, would be required to power the necessary equipment to achieve and maintain the plant in a safe shutdown condition.

In Reference (1), ComEd provided a response to the Station Blackout (SBO) rule for Dresden and Quad Cities Station. This response classified Dresden and Quad Cities stations as 4-hour coping duration plants and presented ComEd's approach to address this duration by AC-independent coping. Following the NRC Staff's initial review of, and negative response to, the original ComEd submittal, the NRC Staff initiated working group meetings with ComEd in late October and December of 1989.

During a presentation to the NRC Staff on March 28, 1990, ComEd provided a revised response for Dresden and Quad Cities stations. In the presentation, ComEd indicated that each station would be provided with a non-Class 1E diesel generator as the AAC power source, which could be connectable to any of the four safety buses and capable of carrying full shutdown loads for the blacked-out units. In accordance with the rule, the EDG target reliability requirement for the stations would still be 0.975.

ComEd then initiated a discussion with the NRC Staff during the meeting, pertaining to the actions or requirements which would be necessary to change the target reliability from 0.975 to 0.95. The NRC Staff agreed to consider lowering the target reliability to 0.95, if the AAC

diesel generator was sized to achieve and maintain safe shutdown for both units at the site in the event of a LOOP (while also crediting the flexibility in the connection capability to the safety buses).

Based on the discussion during the March 1990 meeting with the NRC Staff, ComEd submitted a revised SBO response for Dresden and Quad Cities stations in the Reference (2) letter. In that revised response, ComEd committed to installation of a single non-Class 1E AAC diesel generator, rated at 5700 kw (2000 hour rating), available within one hour, and connectable to any of the four safety buses in the two units at each station. The capacity of the AAC power source would have at least twice the capacity of the existing EDGs (to provide the NRC Staff with the basis to reduce the target reliability to 0.95). In addition, ComEd outlined a commitment to: (1) implement a Diesel Generator reliability program incorporating the 5 elements in Reg Guide 1.155, (2) perform a 1-hour coping assessment considering condensate inventory, Class 1E Battery capacity, compressed air requirements, loss of ventilation, and ability to maintain containment integrity, and (3) develop plans to update procedures and implement modifications (including the AAC) which would reduce risk associated with a station blackout event.

In the Reference (3) letter, the NRC Staff issued Safety Evaluations (SEs) for Dresden and Quad Cities stations, approving the modifications and EDG target reliability. However, the SEs also requested information pertaining to the implementation schedule of the modifications and procedure revisions.

ComEd responded to the NRC Staff request in References (4) and (6). In the Reference (4) letter, ComEd indicated that the implementation schedule for installation of the AAC source at Dresden and Quad Cities stations would be December 1995. ComEd also stated that two AAC-DGs would be installed at each station (as opposed to one AAC-DG at each station).

The NRC Staff issued a supplemental SE in Reference (5). This supplemental SE provided the NRC Staff approval for the two-DG AAC configuration and the associated implementation schedule.

In Reference (6), ComEd indicated that the implementation schedule for SBO procedure revisions and the emergency diesel generator reliability program would be August 1992 and December 1992, respectively.

#### D. Description of Modifications

Each of the AAC-DGs at Dresden and Quad Cities is rated at 4785 kw (2000 hour rating)(total AAC installed capacity of 9570 kw). These are available and controllable within one hour from the Main Control Room, and connectable to the safety buses at each site (Bus 23, 24, 33, and 34 at Dresden and Buses 13-1, 14-1, 23-1, 24-1 at Quad Cities). Each AAC-DG will be primarily dedicated to a specific unit and the safety buses within that unit and will be tested as such, but each generator can also power the safety buses of the opposite unit, up to the current limitation of the safety-related feeds and cross-ties. The AAC power source at Dresden and

Quad Cities will be capable of powering one division of normal safe shutdown systems and equipment for each unit and attaining safe shutdown from the control room. Safe shutdown equipment includes decay heat removal, battery charging, HVAC in dominant areas of concern, and emergency lighting.

The AAC modifications at Dresden and Quad Cities Stations will meet all of the requirements of NUMARC 87-00, Appendix B. With respect to the diversity requirement, the AAC-DGs, and all associated auxiliary electrical and mechanical systems, are completely independent from any existing plant systems, including the existing EDG systems. This independence of systems includes the separate housing facility, the fuel oil storage and transfer system, the jacket water cooling system (independent of the station service water), the starting air system, the DC power source, and the normal building power source. The only interfaces with the existing plant are at the necessary ties to the 4 kV safety buses and the control and monitoring connections to the Main Control Room. In addition, ComEd will implement the NRC Staff recommendation to install the connection from the AAC-DG to the safety buses as Class 1E grade.

## **E. Basis for Proposed Exemption**

### **1. ComEd Efforts to Comply with the Requirements**

ComEd has, in good faith, undertaken efforts to complete all actions necessary to meet the requirements of, and scheduler commitments to 10 CFR 50.63. The information below provides a description of the actions which will be completed by the end of 1995 at Dresden and Quad Cities Stations, as well as the remaining actions which will be completed during the first six months of 1996.

#### **a. Projected Status of SBO Modifications - December 1995**

ComEd will complete the installation and testing of the Dresden Station Unit 2 and Quad Cities Station Unit 2 AAC-DGs, and the necessary electrical tie-ins by the end of 1995. At that time, both sites will be provided with a new source of on-site emergency power (up to 4780 kw) with which to cope with a station blackout event, as well as other potential plant transients. This source of on-site emergency power can be started, controlled, and loaded from the control room within the required one hour. However, ComEd anticipates that the actual response time will be much less than one hour.

In addition to the availability of the AAC-DG to Dresden Unit 2 and Quad Cities Unit 2, the new Division I Cross-tie modification at each site is complete and will provide the ability to supply emergency onsite (and offsite) power between both Units, at each site, on two separate 4 kV bus-ties. These Division I bus-ties are rated at 600 amps. While this is not enough capacity to power the complete set of safe shutdown loads for both units, it can still serve to increase safety margin when used in conjunction with the operable AAC-DG.

By the end of 1995, ComEd will also complete all necessary operator training, simulator upgrades, appropriate operating and maintenance procedures, and establishment of the necessary spare parts inventory for the new equipment.

The Dresden Unit 3 and Quad Cities Station Unit 1 AAC-DGs, and all required diesel generator auxiliaries, will be installed and modification/acceptance tested by the end of 1995. The following actions will be completed during D3R14 (scheduled to start in March 1996) and Q1R14 (scheduled to start in first quarter of 1996).

- Installation of the 4kv ties from the AAC-DG to the existing station safety bus.
- Modification and upgrade of safety-related breakers.
- Post-modification/operability testing of the AAC-DG system.

**b. Status of Other SBO Commitments**

In addition to the AAC-DG modifications, ComEd committed to implement other analyses and procedure revisions, all of which were intended to mitigate the consequences of a station blackout event. The status of these commitments were reviewed by the NRC staff during site inspections at both Quad Cities and Dresden in early 1993.

The following procedures have been updated since the original commitment:

- **Partial or Complete Loss of AC Power**  
*Revised to confirm correct position of containment isolation valves, ensure diesel driven fire pump condensate supply to Isolation Condenser is not clogged, and non-essential battery loads are removed.*
- **Ventilation System Failure**  
*Revised to identify room and panel doors to be opened in the Main Control Room and Auxiliary Electrical Room to maintain equipment below 120°F during SBO event.*
- **Tornado Warnings/Severe Winds**  
*Revised to verify availability of EDGs, return safe shutdown equipment to operating status if out of service, and secure potential missiles if warnings of severe weather have been issued.*
- **Restoration of AC Power**  
*Revised to provide guidance to load dispatcher to prioritize restoration of off-site power to the affected nuclear stations.*
- **Station Battery Performance Tests**  
*Revised to ensure battery aging margin is accounted for when evaluating battery capacity requirements*

The following program has been established and implemented at both Dresden and Quad Cities Stations, thereby conforming to the five elements of a diesel generator reliability program as defined by Regulatory Guide 1.155:

- o NOD-TS.20  
Emergency Diesel Generator Reliability Program (This program applies to both SBO DGs and Class 1E EDGs)

## 2. Basis for Schedular Delay of Modifications

By the end of 1995, all of the AAC modifications associated with Unit 2 at both Dresden and Quad Cities will be complete and operational. The SBO AAC modifications for Dresden Station Unit 3 and Quad Cities Station Unit 1 will be complete, except for the final tie-in to the plant 4kv safety-related buses, installation of higher rated breakers that cannot otherwise be installed pre-outage, construction and modification testing of these breakers, and the final operability test. These final actions will require placing the reactors in a defueled condition.

In order to complete the 4 kv electrical tie-ins and the final operability testing of the AAC-DGs, each site will be required to completely and consecutively de-energize both safety buses (buses 33/34 at Dresden and 13-1/14-1 at Quad Cities). ComEd has determined that this configuration is unacceptable from a nuclear safety perspective, in all but a defueled condition.

It should also be noted that these auxiliary electrical configuration considerations were the primary reason for not completing the required electrical tie-ins and post-modification testing during the forced outage on Dresden Unit 3 during the summer of 1995.

The electrical tie-ins and operability testing activities were originally scheduled to be completed during D3R14 and Q1R14, with outage start dates during the Fall of 1995. These refuel outages were extended beyond 1995 due to unanticipated extensions of the previous refuel outages (D3R13 and Q1R13), and unplanned forced outages to implement improvement initiatives.

## F. Supporting Justification and Safety Evaluation for the Proposed Exemption

ComEd has evaluated the deterministic and probabilistic impact of the one-time schedular exemption upon the safety and health of the public, as well as the overall risk to nuclear safety. This evaluation has indicated that the proposed exemption satisfies the criteria of 10 CFR 50.12.(a)(1) at Dresden and Quad Cities; that is, the proposed exemption does not present an undue risk to the public health and safety.

Based upon the current project status, ComEd will complete the commitments related to the Division I bus-tie, both AAC-DGs (and all associated auxiliaries), electrical tie-ins and operability testing for the Dresden Unit 2 and Quad Cities Unit 2 AAC systems, all required



procedure revisions, and the diesel generator reliability program by December 31, 1995 (the original commitment date), at both Dresden and Quad Cities stations. These actions will provide an additional on-site alternate AC source to each site, as well as increased operational flexibility with respect to the cross-tie of 4 kV safety buses. These enhancements will increase safety margins.

From a risk perspective, ComEd has evaluated the probabilistic impact of a six month delay for completion of both AAC-DGs (as a bounding case), upon the Core Damage Frequency (CDF) and the Core Damage Probability (CDP) at both Dresden and Quad Cities stations. This evaluation indicated that the impact upon CDF and CDP at Dresden and Quad Cities is significantly less than accepted industry guidelines.

## 1. Dresden Station Probabilistic Evaluation

A recent sensitivity study using ComEd's enhanced PRA model for Dresden Station [which is described in the Reference (7) letter to the USNRC] indicated that the maximum benefit of adding perfect AAC-DGs would be a  $3.0 \text{ E-7/yr}$  reduction in core damage frequency (CDF). This reduction in CDF corresponds to an 8% reduction of the total CDF of  $3.67 \text{ E-6/yr}$  for the Dresden Unit 2 model, and a 7% reduction of the total CDF of  $4.36 \text{ E-6/yr}$  for the Dresden Unit 3 model. Therefore, the maximum benefit from the SBO DGs would be a  $3.0 \text{ E-7/yr}$  reduction in CDF.

Delaying the SBO modifications at Dresden by six months does not change the CDF for the current plant configuration, and Nuclear Energy Institute (NEI) guidelines do not explicitly address such delays. However, the NEI guidelines do address temporary increases in risk. In order to assess the impact of delaying the SBO modifications, ComEd applied the NEI guidelines as if the 6 month delay caused a temporary CDF increase of  $3.0 \text{ E-7/yr}$ .

A CDF increase of  $3.0 \text{ E-7/yr}$  for 6 months (0.5 year) corresponds to an increase in core damage probability (CDP) of  $1.5 \text{ E-7}$ . Under the current NEI guidelines, temporary plant changes giving a CDP increase of less than  $1 \text{ E-6}$  are not risk significant. Therefore, a 6 month delay in the operability of one AAC-DG at Dresden Station is not risk significant.

## 2. Quad Cities Station Probabilistic Evaluation

ComEd's IPE for Quad Cities Station included sensitivity studies related to the benefits of hardware and procedure changes at Quad Cities Station:

- One of these sensitivity studies concluded that a procedure to permit RCIC operation in a manual mode that is independent of DC power sources would lead to a 43% reduction in core damage frequency (CDF), giving a new value of  $6.81 \text{ E-07/yr}$ . This procedure is now implemented.
- An additional sensitivity study concluded that this RCIC procedure, combined

with the addition of an SBO DG for each unit, and use of station maintenance batteries or a portable DC generator (to maintain DC power for a longer period in SBO events), would lead to a 47% reduction in core damage frequency (CDF), giving a new value of  $6.38 \text{ E-07/yr}$ .

The difference between the CDF values for these two cases (i.e., a  $4.3 \text{ E-8/yr}$  reduction, equaling 4% of the total CDF of  $1.20 \text{ E-6/yr}$  as noted in the Quad Cities IPE) is a bounding value for the decrease in CDF that will be achieved by completion of the SBO DG modifications (since the necessary RCIC procedure has been implemented). This CDF difference is a bounding value because it represents the benefit of not only the SBO DGs, but also the benefit of a procedure to extend the period during which DC power would be available should an SBO occur.

Delaying the SBO modifications at Quad Cities by six months does not change the CDF for the current plant configuration, and NEI guidelines do not explicitly address such delays. However, the NEI guidelines do address temporary increases in risk. In order to assess the impact of delaying the SBO modifications, ComEd applied the NEI guidelines as if the 6 month delay caused a temporary CDF increase of  $4.3 \text{ E-8/yr}$ .

A CDF increase of  $4.3 \text{ E-8/yr}$  for 6 months (0.5 year) corresponds to an increase in core damage probability (CDP) of  $2.2 \text{ E-8}$ . Under the current NEI guidelines, temporary plant changes giving a CDP increase of less than  $1 \text{ E-6}$  are not risk significant. Therefore, a six month delay in the operability of one AAC-DG at Quad Cities Station is not risk significant.