



Commonwealth Edison

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October 29, 1984

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

Subject: Byron Generating Station Unit 1
Request for Exemptions from 10 CFR 50
NRC Docket No. 50-454

Reference (a): October 18, 1984 letter from T. M. Novak
to D. L. Farrar

Dear Mr. Denton:

This letter documents the justification provided by Commonwealth Edison in support of License Conditions 4, 6, 12 and 18 (Reference a). Although it is not clear that the matters covered by these conditions are such that exemptions from 10 CFR 50 are required, Commonwealth Edison judges it to be prudent in light of NRC Staff guidance to request, in accordance with 10 CFR 50.12(a), that the justification for those License Conditions be confirmed by the issuance of specific exemptions to the requirements of 10 CFR 50 Appendix A, General Design Criteria 2, 3, 13 and 17, as well as 19 respectively.

NRC regulations provide for specific exemptions in 10 CFR 50.12(a). The Commission has provided additional guidance regarding this regulation in an order in the Shoreham proceeding, as modified by Commission action on July 25, 1984.

In view of the standards in 10 CFR 50.12(a) and the Commission guidance regarding the issuance of exemptions, one may synthesize the circumstances in which the requested exemption is warranted as follows: (1) the activities to be conducted are authorized by law, (2) operation with the exemption does not endanger life of property because such would not involve undue risk to the health and safety of the public, (3) the common defense and security are not endangered, and (4) the exemption is in the public interest because, on balance, there is good cause for granting it and the public health and safety are adequately protected.

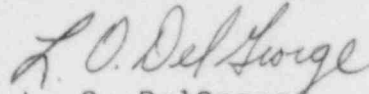
Attachments A through D to this letter demonstrate that exemptions from GDC's 2, 3, 13 and 17, as well as 19 are warranted with respect to the matters discussed in License Conditions 4, 6, 12 and 18.

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Please address further questions regarding this matter to this office.

Very truly yours,



L. O. DelGeorge
Assistant Vice President

Attachments

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ATTACHMENT A

JUSTIFICATION FOR EXEMPTION FROM GDC 2

LICENSE CONDITION 4: SEISMIC QUALIFICATION

Exemption: As identified in the October 16, 1984 letter from T. R. Tramm to H. R. Denton, certain circuit boards require modification to reduce the instrument error that may be induced under dynamic loads during a seismic event. The requested exemption would allow this work to be completed prior to startup following the first refueling outage.

I. The Requested Exemptions and the Activities Which Would Be Allowed Thereunder are Authorized by Law

If the criteria established in 10 CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition of law exists to preclude the activities which would be authorized by the requested exemption, and there is no such prohibition, then the Commission is authorized by law to grant this exemption request.^{1/}

II. The Requested Exemptions Will Not Endanger Life or Property

10 CFR 50, Appendix A, General Design Criterion 2 states that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena such as earthquakes without loss of capability to perform their safety functions.

The Reactor Protection System at Byron Station includes the Westinghouse 7300 Process Protection System. Draft License Condition 4 requires that the licensee complete seismic qualification of the Westinghouse 7300 Process Protection System prior to startup following the first refueling outage.

Previous seismic qualification testing of the Westinghouse 7300 Process Protection System resulted in acceptable performance at Byron seismic levels with few exceptions. Components that did not perform acceptably underwent additional seismic qualification testing. The results of the supplemental seismic testing are discussed in the October 16, 1984 letter from T. R. Tramm to H. R. Denton. During this supplemental testing some circuit cards performed outside of their expected range. For one of these circuit cards, the additional error was evaluated and found not to affect any safety related circuits. A temporary modification has been made to another affected card to eliminate its abnormal performance under seismic conditions.

Two other circuit cards that experienced additional error during this seismic testing provide a flux penalty input to the Overtemperature Delta T reactor trip setpoint. During an abnormal operation of the plant with a flux offset, a concurrent seismic event, and the worst case circuit card error in the least conservative direction, a slight delay in the reactor trip function may occur. The scenario outlined above is highly improbable. For these reasons, operating the plant for the first fuel cycle without permanent circuit card modifications in place will not endanger life or property.

III. The Requested Exemptions Will Not Endanger The Common Defense and Security

The common defense and security are not implicated in these exemption requests. Only the potential impact on public health and safety is at issue.

IV. The Requested Exemptions Are in the Public Interest

The requested exemptions are in the public interest because any delay in commencement of low power testing and power ascension would cause a delay in the attainment of commercial operation and because, as shown above, the health and safety of the public will be adequately protected.

Byron Unit 1 is physically complete in all essential respects and is ready for low power testing and ascension to full power. Upon satisfactory completion of the power ascension testing program in accordance with the license and technical specifications, the facility will be placed in commercial operation.

Unless the requested exemption to General Design Criterion 2 is granted there will be a substantial delay in the startup and operation of Byron Unit 1. As detailed in the September 27, 1984 affidavit of Ralph L. Heumann, Vice President of Commonwealth Edison Company,^{2/} the principal costs affected by such a delay are Allowance for Funds Used During Construction ("AFUDC"), continuing overhead and standby costs, and additional fuel and purchased power costs. Presently, these costs of delay in the startup of Byron total approximately \$40 million per month of delay.

Denial of the requested exemption would have a substantial financial impact on Commonwealth Edison and its customers and is not warranted in as much as, as shown above, the public health and safety are adequately protected.

1/ See U.S. vs. Allegheny-Ludlum Steel Corp., 406 U.S. 742, 755 (1972).

2/ Mr. Heumann's affidavit is attachment 2 to Commonwealth Edison Company's Answer to Intervenors' Motion to Reopen the Record, submitted to the Licensing Board on October 2, 1984.

ATTACHMENT B

JUSTIFICATION FOR EXEMPTION FROM GDC 3

LICENSE CONDITION 6: FIRE PROTECTION

Exemption: The requested exemption would allow several modifications to fire protection systems to be completed prior to exceeding 5% power. These modifications are:

- a) modifications required for conformance with NFPA codes as delineated in Amendment 4 to the Fire Protection Report and in CECO. letters dated August 20, 1984, October 11, 1984 and October 15, 1984,
- b) modifications to the carbon dioxide fire suppression system as described in the CECO. letter dated September 19, 1984,
- c) installation of the "fire hazards panel" as described in the CECO. letter dated October 11, 1984,
- d) analysis and modification, as necessary, of the pressurizer PORV control circuitry with respect to spurious operation because of fire damage as described in the CECO. letter dated October 15, 1984.

I. The Requested Exemptions and the Activities Which Would Be Allowed Thereunder are Authorized by Law

If the criteria established in 10 CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition of law exists to preclude the activities which would be authorized by the requested exemption, and there is no such prohibition, then the Commission is authorized by law to grant this exemption request.^{1/}

II. The Requested Exemptions Will Not Endanger Life or Property

10 CFR 50, Appendix A, General Design Criterion 3 states that structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Appendix R of 10 CFR 50 sets forth guidance for fire protection features required to satisfy General Design Criterion 3. When considering the effects of fire, Appendix R emphasizes the importance of systems associated with achieving and maintaining safe shutdown conditions.

Draft license conditions 6d, e, f, and g require the remaining features of the Byron fire protection program to be completed prior to exceeding 5% power.

During the short period of operating time between initial criticality of the reactor and 5% power, there will be a very low fission product inventory accumulated within the reactor. The consequences of fire damage to safe shutdown equipment are much less severe because of this. Considering the low probability of a fire occurring during this short time frame, this limited number of incomplete features of the overall fire protection program at Byron Station should not affect the ability to safely shutdown the plant from 5% power or less.

License condition 6d requires all remaining modifications related to conformance with National Fire Protection Association Codes referenced in BTP CMEB 9.5-1 to be completed prior to exceeding 5% power. These modifications involve minor improvements to existing fire detection and suppression systems that have already been tested to demonstrate their proper operation. The systems associated with achieving and maintaining safe shutdown conditions are not affected by these modifications.

License condition 6e requires the modifications to the carbon dioxide fire suppression system for the lower cable spreading room to be completed prior to exceeding 5% power. The modifications to be implemented will enhance the reliability of the CO₂ system by ensuring system operation even when single active failures are assumed. The existing CO₂ system is actuated automatically and has the capability to be manually re-actuated if necessary. The lower cable spreading room fire areas are enclosed by 3-hour rated fire barriers. The safe shutdown analysis has demonstrated that loss of all cables in any of the cable spreading room fire zones will not prevent safe shutdown of the plant. The multiple levels of fire protection features in the lower cable spreading room provide adequate assurance that the plant could be safely shutdown in the event a fire during the short operating time of Byron Unit 1 up to 5% power.

License condition 6f requires the fire hazards panel and associated instrumentation to be installed prior to exceeding 5% power. This panel, which contains redundant safe shutdown instrumentation, is being installed to address NRC concerns regarding the consequences of a fire in the auxiliary electric equipment room or control room.

We consider interim operation of Byron 1 without this panel to be acceptable based upon: 1) the relatively low likelihood of a damaging fire in either the control room or the auxiliary electric equipment room during operation up to 5% power, (2) the circuits involved serve monitoring functions, not control functions, and (3) our commitment to implement a fire watch in the auxiliary electric equipment room and to sample reactor coolant boron concentration if source range indication is lost due to a control room fire.

License condition 6g requires the analysis of spurious operation of the pressurizer PORV's due to fire, and any necessary modifications, to be completed prior to exceeding 5% power. The applicant has completed a preliminary analysis of the potential for spurious operation of the pressurizer PORV's. In order for this spurious operation to occur, a fire must damage the control power cable to the PORV, the control cable to the block valve limit switch, and the power cable to the block valve. The cable failure must be such that:

- a) the block valve control cable either shorts or opens and,
- b) the PORV control power cable has a sustained short to another cable such that the solenoid power conductor shorts to a positive DC source conductor and,
- c) the block valve power cable either shorts or opens.

Due to the number of events that must occur simultaneously, the applicant considers the potential for spurious operation of a pressurizer PORV due to a fire during the short operating time up to 5% power to be extremely unlikely.

Based on the preceding discussions, we believe that life nor property will be endangered by operation of Byron Station up to 5% power with a limited number of fire protection features incomplete.

III. The Requested Exemptions Will Not Endanger The Common Defense and Security

The common defense and security are not implicated in these exemption requests. Only the potential impact on public health and safety is at issue.

IV. The Requested Exemptions Are in the Public Interest

The requested exemptions are in the public interest because any delay in commencement of low power testing and power ascension would cause a delay in the attainment of commercial operation and because, as shown above, the health and safety of the public will be adequately protected.

Byron Unit 1 is physically complete in all essential respects and is ready for low power testing and ascension to full power. Upon satisfactory completion of the power ascension testing program in accordance with the license and technical specifications, the facility will be placed in commercial operation.

Unless the requested exemption to General Design Criterion 3 is granted there will be a substantial delay in the startup and operation of Byron Unit 1. As detailed in the September 27, 1984 affidavit of Ralph L. Heumann, Vice President of Commonwealth Edison Company,^{2/} the principal costs affected by such a delay are Allowance for Funds Used During Construction ("AFUDC"), continuing overhead and standby costs, and additional fuel and purchased power costs. Presently, these costs of delay in the startup of Byron total approximately \$40 million per month of delay.

Denial of the requested exemption would have a substantial financial impact on Commonwealth Edison and its customers and is not warranted in as much as, as shown above, the public health and safety are adequately protected.

^{1/} See U.S. vs. Allegheny-Ludlum Steel Corp., 406 U.S. 742, 755 (1972).

^{2/} Mr. Heumann's affidavit is attachment 2 to Commonwealth Edison Company's Answer to Intervenors' Motion to Reopen the Record, submitted to the Licensing Board on October 2, 1984.

ATTACHMENT C

JUSTIFICATION FOR EXEMPTION FROM GDC 13 and 17

LICENSE CONDITION 12: RELIABILITY OF DIESEL GENERATORS

Exemption: Changes may be necessary to reduce the vibration of instrumentation on the local diesel generator control panels. If changes are found to be necessary, the requested exemption would allow them to be implemented prior to startup following the first refueling.

I. The Requested Exemptions and the Activities Which Would Be Allowed Thereunder are Authorized by Law

If the criteria established in 10 CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition of law exists to preclude the activities which would be authorized by the requested exemption, and there is no such prohibition, then the Commission is authorized by law to grant this exemption request.^{1/}

II. The Requested Exemptions Will Not Endanger Life or Property

10 CFR 50, Appendix A, General Design Criterion 13 states that instrumentation shall be provided to monitor variables and systems over their anticipated ranges for normal operation, for anticipated operational occurrences, and for accident conditions as appropriate to assure safety. In addition, 10 CFR 50, Appendix A, General Design Criterion 17 states that an onsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety.

Draft license condition 12 states that there must be reasonable assurance that any induced vibration due to diesel generator operation will not result in cyclic fatigue failure of the instruments and controls within the floor mounted diesel generator panels. It requires the licensee to implement modifications or submit an evaluation that demonstrates the design objective described above has been achieved, prior to startup following the first refueling outage.

The applicant has submitted an evaluation of the design of the diesel generator panels in a letter dated October 16, 1984 from T. R. Tramm to H. R. Denton. This evaluation was based upon actual vibration measurements taken on the panels during diesel generator operation. These results were compared to previous seismic tests on the panels and to vibration aging tests performed on similar control panels. Our conclusion was that the panels and instruments should not experience significant vibration aging that would affect reliable operation of the diesel generators over the life of the plant.

NRC staff review of this information is not complete. However, vibration aging due to cyclic fatigue is a cumulative, long term effect that is not anticipated to prevent reliable operation of the diesel generator during the first fuel cycle.

Based on the foregoing reasons, the applicant believes that life nor property will be endangered by operation of Byron Unit 1 for the first fuel cycle in this unresolved condition.

III. The Requested Exemptions Will Not Endanger The Common Defense and Security

The common defense and security are not implicated in these exemption requests. Only the potential impact on public health and safety is at issue.

IV. The Requested Exemptions Are in the Public Interest

The requested exemptions are in the public interest because any delay in commencement of low power testing and power ascension would cause a delay in the attainment of commercial operation and because, as shown above, the health and safety of the public will be adequately protected.

Byron Unit 1 is physically complete in all essential respects and is ready for low power testing and ascension to full power. Upon satisfactory completion of the power ascension testing program in accordance with the license and technical specifications, the facility will be placed in commercial operation.

Unless the requested exemptions to General Design Criterion 13 and 17 is granted there will be a substantial delay in the startup and operation of Byron Unit 1. As detailed in the September 27, 1984 affidavit of Ralph L. Heumann, Vice President of Commonwealth Edison Company,^{2/} the principal costs affected by such a delay are Allowance for Funds Used During Construction ("AFUDC"), continuing overhead and standby costs, and additional fuel and purchased power costs. Presently, these costs of delay in the startup of Byron total approximately \$40 million per month of delay.

Denial of the requested exemption would have a substantial financial impact on Commonwealth Edison and its customers and is not warranted in as much as, as shown above, the public health and safety are adequately protected.

1/ See U.S. vs. Allegheny-Ludlum Steel Corp., 406 U.S. 742, 755 (1972).

2/ Mr. Heumann's affidavit is attachment 2 to Commonwealth Edison Company's Answer to Intervenors' Motion to Reopen the Record, submitted to the Licensing Board on October 2, 1984.

ATTACHMENT D

JUSTIFICATION FOR EXEMPTION FROM GDC 19

LICENSE CONDITION 18: CONTROL ROOM VENTILATION

Exemption: Changes may be necessary to the control room ventilation system to assure that operator doses during postulated accidents are kept acceptably low. The requested exemption would allow whatever changes are necessary to be completed prior to exceeding 25% power.

I. The Requested Exemptions and the Activities Which Would Be Allowed Thereunder are Authorized by Law

If the criteria established in 10 CFR 50.12(a) are satisfied, as they are in this case, and if no other prohibition of law exists to preclude the activities which would be authorized by the requested exemption, and there is no such prohibition, then the Commission is authorized by law to grant this exemption request.^{1/}

II. The Requested Exemptions Will Not Endanger Life or Property

10CFR50, Appendix A General Design Criterion 19 requires that the control room be habitable under normal and accident conditions, including the loss-of-coolant accident, such that operators can safely operate the nuclear power unit under those conditions. Radiation protection should be provided which prevents personnel from receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body during the occupancy of the control room for the duration of the accident. Our calculations indicate that the habitability systems will limit the control room operators' whole body dose to less than 5 rem. Conservative analyses of the effectiveness of these systems indicate that they may not meet the equivalent dose limit of 30 rem for radioiodine under all circumstances.

Additional testing may demonstrate that the installed systems are adequate. Modifications or repairs may also be necessary. This additional work will be completed prior to exceeding 25% power. In the interim, operation of Byron 1 is acceptable because:

1. The fission product inventory at power levels below 25%, resulting from the startup test program, is very small and poses no real risk to control room operators. (The reactor

will have experienced roughly 30 days of critical operation at power levels generally below 10% during this period.)

2. The likelihood of a major LOCA during this time frame at these low power levels is extremely small.

On this basis this exemption will not endanger life or property.

III. The Requested Exemptions Will Not Endanger The Common Defense and Security

The common defense and security are not implicated in these exemption requests. Only the potential impact on public health and safety is at issue.

IV. The Requested Exemptions Are in the Public Interest

The requested exemptions are in the public interest because any delay in commencement of low power testing and power ascension would cause a delay in the attainment of commercial operation and because, as shown above, the health and safety of the public will be adequately protected.

Byron Unit 1 is physically complete in all essential respects and is ready for low power testing and ascension to full power. Upon satisfactory completion of the power ascension testing program in accordance with the license and technical specifications, the facility will be placed in commercial operation.

Unless the requested exemption to General Design Criterion 19 is granted there will be a substantial delay in the startup and operation of Byron Unit 1. As detailed in the September 27, 1984 affidavit of Ralph L. Heumann, Vice President of Commonwealth Edison Company,^{2/} the principal costs affected by such a delay are Allowance for Funds Used During Construction ("AFUDC"), continuing overhead and standby costs, and additional fuel and purchased power costs. Presently, these costs of delay in the startup of Byron total approximately \$40 million per month of delay.

Denial of the requested exemption would have a substantial financial impact on Commonwealth Edison and its customers and is not warranted in as much as, as shown above, the public health and safety are adequately protected.

1/ See U.S. vs. Allegheny-Ludlum Steel Corp., 406 U.S. 742, 755 (1972).

2/ Mr. Heumann's affidavit is attachment 2 to Commonwealth Edison Company's Answer to Intervenors' Motion to Reopen the Record, submitted to the Licensing Board on October 2, 1984.

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