



Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

October 8, 1993

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attn: Document Control Desk

Subject: Dresden Nuclear Power Station Units 2 and 3
Quad Cities Nuclear Power Station Units 1 and 2
Application for Amendment to Facility Operating Licenses
DPR-19, DPR-25, DPR-29, and DPR-30
NRC Docket Nos. 50-237/249 and 50-254/265

Reference: (a) L. DelGeorge letter to T. Murley, dated September 15,
1993.

Dr. Murley:

Pursuant to 10 CFR 50.90, Commonwealth Edison Company (CECo) proposes to amend Facility Operating Licenses DPR-19, DPR-25, DPR-29, and DPR-30, to disposition an Unreviewed Safety Question (USQ) related to proposed plant modifications associated with Reactor Vessel Level Instrumentation. These modifications have been initiated to mitigate the circumstances outlined in NRC Bulletin (IEB) 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs." The plant modifications are being installed per the schedules outlined in the Reference (a) letter. Based upon the CECo modification schedule, CECo requests approval of the USQ prior to November 22, 1993.

Attachment A to this letter provides a description and safety analysis of the proposed changes. Attachment B describes CECo's evaluation performed in accordance with 10 CFR 50.92(c), which confirms that no significant hazards consideration is involved. Attachment C provides an Environmental Assessment.

The proposed changes have been reviewed and approved by CECo On-Site and Off-Site Review in accordance with Commonwealth Edison procedures.

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.

k:\nla\dresden\rvlis6.wpf\1

120065

9310130459 931008
PDR ADCK 05000237
PDR

DEH 11/1

Dr. Murley

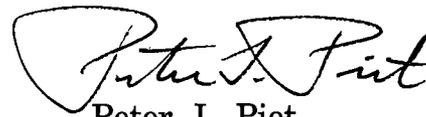
- 2 -

October 8, 1993

Commonwealth Edison is notifying the State of Illinois of this application for amendment by transmitting a copy of this letter and its attachments to the designated state official.

Please direct any questions you may have concerning this submittal to this office.

Sincerely,



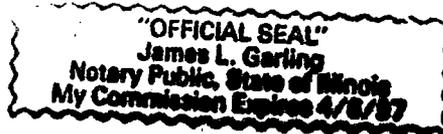
Peter L. Piet
Nuclear Licensing Administrator

Attachments:

- A. Description and Safety Analysis of the Proposed Changes
- B. Significant Hazards Consideration
- C. Environmental Assessment Statement Applicability Review

cc: J. B. Martin, Regional Administrator - RIII
T. Taylor, Senior Resident Inspector - Quad Cities
M. N. Leach, Senior Resident Inspector - Dresden
J. L. Kennedy, Project Manager - NRR
C. P. Patel, Project Manager - NRR
J. F. Stang, Project Manager - NRR
Office of Nuclear Facility Safety - IDNS

Signed before me on this 8TH day
of OCTOBER, 1993,
by James L. Garling
Notary Public



ATTACHMENT A

DESCRIPTION AND SAFETY ANALYSIS OF THE PROPOSED CHANGES

Schedule for Modification Installation and Review of License Amendment

CECo proposes to install Reactor Pressure Vessel Backfill Modifications to address the concerns discussed in NRC Bulletin (IEB) 93-03. The current schedule outlines the complete installation and implementation of the modifications during planned maintenance outages for Quad Cities Unit 1 (November 1993) and Quad Cities Unit 2 (December 1993). For Dresden Unit 2, CECO plans to implement the modifications during the first Cold Shutdown after December 1, 1993. For Dresden Unit 3, CECO plans to implement the modifications during the upcoming Refueling Outage (D3R13) currently scheduled to begin during March 1994.

The submittal of this proposed License Amendment is based upon CECO's determination that the proposed modifications involve an Unreviewed Safety Question (USQ). The proposed modifications increase the probability of a previously analyzed accident due to the potential for inadvertent closure of the Reference Leg root valve and subsequent pressurization of the Reactor Pressure Vessel (RPV) Level and Containment Pressure instrumentation. This potential event was first identified by the industry and communicated to CECO in August 1993. CECO incorporated this information into the design and evaluation of the proposed Backfill modification at Dresden and Quad Cities Stations. Therefore, CECO requests review and approval of the proposed amendment to Facility Operating Licenses DPR-19, DPR-25, DPR-29, and DPR-30 prior to November 22, 1993 in order to support the current implementation schedule.

Description of Proposed License Amendment

The Reactor Vessel Level Indication System (RVLIS) backfill modification is being installed at Dresden Units 2 and 3 and Quad Cities Units 1 and 2 in response to NRC Bulletin 93-03. The actual physical routing of the designs at both stations is similar to the design that has previously been installed within the industry. The proposed backfill subsystem will resolve the concern of inaccurate Reactor Pressure Vessel (RPV) level indication due to the presence of noncondensable gases in the RVLIS reference legs after a depressurization of the vessel.

Implementation of the modification creates the potential for pressurizing one of the RVLIS reference legs to CRD drive water header pressure in the event of a root

valve closure with the backfill subsystem in operation (see attached drawing). The condition could activate RPV low level safety features as well as RPV high pressure safety features depending on which valve is closed.

The likelihood of this event occurring is small due to the physical location of the valves and the administrative controls that govern the operation of the valves. For these reasons, the potential increase in the probability of a previously analyzed accident is not significant.

Description of the Proposed Modifications

As previously stated, a modification to RVLIS is currently planned for installation at Dresden and Quad Cities Stations to meet the requirements of NRC Bulletin 93-03. This modification includes the connection of a low flow, high pressure water supply to 4 reference legs to provide a continuous backfill through the reference leg, condensate pot and the reactor vessel. The source of the water supply is the CRD drivewater header, which currently has pressure control at approximately 300 psi above reactor pressure. The new backfill subsystem provides deaerated water to the reference leg to prevent the accumulation of dissolved gases that can later come out of solution during reactor vessel depressurization.

The new subsystem prevents degraded level indications commonly appearing as "notches" by 1) forming a barrier of degassed water that will prevent gases from dissolving in the condensate pot and being transported down the reference leg, 2) purging the reference leg with deaerated water to "sweep" dissolved gases from the reference leg, and 3) providing a continuous fill of the reference leg in case non-condensable gases prevent adequate condensation in the condensate pot to otherwise keep the reference leg full of water.

The new backfill subsystem utilizes water from the CRD drivewater header. This water supply flows to each of 2 instrument racks, 2201(2)-5 and 2201(2)-6 at Quad Cities and 2202(3)-5 and 2202(3)-6 at Dresden. Near these racks is a new panel with 2 flow stations and a water filter which acts as a pressure snubber. Each flow station consists of: needle valves for system startup and shutdown; metering valves for flow regulation; local flow indicators for setting flow rates through the backfill line for each reference leg; multiple check valves for SR-to-NSR and/or system separation; instrument taps for testing components; a vent connection for purging air from the lines; and isolation valves to isolate components for maintenance. A detailed isometric drawing of the preliminary design is attached.

During power operation, there exists a small potential for the inadvertent valve

manipulation error of a reference leg root valve. These valves currently exist and are located near the drywell penetration for the reference leg instrument lines. As previously stated, these valves are only occasionally closed to perform maintenance during outages.

If a reference leg root valve were to be inadvertently closed in the current unmodified configuration, the affected instruments using the reference leg would be inoperable. The pressure instruments would indicate the existent pressure at the time of isolation or show a declining pressure if there is leakage from the reference leg. Level instruments would also lose accuracy but would not immediately cause an ESF actuation. The following event is possible, though very unlikely, in the modified RVLIS system, if 1) the Unit is at power, 2) the reference leg root valve is inadvertently closed, and 3) the backfill system has not been first isolated and continues injecting CRD drivewater into the reference leg to pressurize it to approximately 1300 psig at normal vessel pressure. This event causes the affected pressure instruments to indicate a false high reactor pressure and the level instruments to indicate or trip on a false low level indication.

The speculated consequences of the inadvertent closing of each reference leg root valve without first isolating the backfill subsystem are estimated below.

Condensate Pot [Quad Cities 1(2)-0263-12A Dresden 2(3)-0263-12A]

- * All reactor vessel relief valves open immediately due to high indicated pressure (greater than 1135 psig)
- * High Pressure reactor SCRAM
- * Isolation Condenser initiation due to high pressure [Dresden]
- * Low water level reactor SCRAM
- * Low-low water level Group 1 isolation (MSIV's close)
- * HPCI starts and injects on the (false) low-low water level
- * RCIC starts and injects on (false) low-low water level [Quad Cities]
- * Low pressure ECCS systems start on low pressure permissive signal or after 8.5 minutes, whichever occurs first
- * Some false low water level indications in the Control Room, but most

are unaffected

NOTE: Normal feedwater level control, but feedwater pump and HPCI [turbine for Quad Cities] trips on high water level are inoperable. Turbine [HPCI for Quad Cities] and RCIC [Quad Cities] trips on high water level are still available from unaffected reference leg.

Condensate Pot [Quad Cities 1(2)-0263-12B Dresden 2(3)-0263-12B]

- * Same as 1(2)-0263-12A [Quad Cities] and 2(3)-0263-12A [Dresden], except that reactor vessel relief valves will not open immediately on high pressure but may open after 8.5 minutes to perform the function of ADS

Condensate Pot [Quad Cities 1(2)-0263-13A Dresden 2(3)-0263-13A]

- * If LT 1(2)-0646-A [Quad Cities] and 2(3)-0646A [Dresden] is selected for normal feedwater level control, feedwater flow will increase to makeup for the (false) low water level indication. Pumps will trip on high water level trips, if they are not secured manually or level control is not switched to other level channel.

If LT 1(2)-0646-B [Quad Cities] and 2(3)-0646B [Dresden] is selected for normal water level control, feedwater level control is unaffected.

- * Some false low water level indications in the Control Room, but most indicators are unaffected
- * Some false pressure indication in the Control Room, but most indicators are unaffected

Condensate Pot [Quad Cities 1(2)-0263-13B and Dresden 2(3)-0263-13B]

- * If LT 1(2)-0646-B [Quad Cities] and 2(3)-0646B [Dresden] is selected for normal feedwater level control, feedwater flow will increase to makeup for the (false) low water level indication. Pumps will trip on high water level trips, if they are not secured manually or level control is not switched to other level channel.

If LT 1(2)-0646-A [Quad Cities] and 2(3)-0646A [Dresden] is selected

for normal water level control, feedwater level control is unaffected.

- * Some false low water level indications in the Control Room, but most indicators are unaffected
- * Some false pressure indication in the Control Room, but most indicators are unaffected

The increased significance of the inadvertent valve closure described above causes these events to be similar to previously analyzed accidents and transients. For example, the event on the reference leg from the 12A condensate pot causes the Target Rock and Electromatic Relief Valves to immediately open causing a loss of coolant. Other ECCS systems and RCIC (for Quad Cities) start and inject into the vessel in a manner similar to a Loss of Coolant Accident (LOCA). If the reference leg from the 13A or 13B condensate pot is isolated and that loop is being used for feedwater level control, the response of the plant is similar to a failure open of a feedwater regulating valve. The feedwater pump runout trip would not occur, but the high water level trip of the feedwater pumps and turbine would still be operable. The potential valve manipulation errors, therefore, can be considered an "increase in the probability of occurrence or consequences of an accident or malfunction of equipment important to safety." The installation of the modification with this configuration represents an Unreviewed Safety Question under paragraph "a(2)i" of 10CFR50.59. NRC review and concurrence with the No Significant Hazards Analysis is required.

Justification of Proposed Modifications and License Amendment

The modifications described above are being installed in response to an issue identified in NRC Bulletin (IEB) 93-03, "Resolution of Issues Related to Reactor Water Level Instrumentation in BWRs." The installation of these modifications will enhance plant safety by assuring that the degassing phenomenon described in Bulletin 93-03 will not be encountered at Dresden and Quad Cities Stations.

The modifications are similar in design to modifications that have been installed at other plants. To date, Commonwealth Edison is unaware of any difficulties or operational concerns that other licensees have encountered as a result of implementing similar types of backfill modifications to address the degassing phenomenon described in IEB 93-03.

The potential safety issues (described in the Description of Proposed Modifications section above) associated with installation of these modifications are not significant for the following reasons:

The root valve(s) referred to above are installed so that the instrument lines can be isolated. Isolation of the instrument lines is required when the

excess flow check valves in those lines are repaired, tested, or when the instrument lines are taken out of service for other reasons. These administrative measures will be procedurally controlled at both Dresden and Quad Cities Stations. The testing and/or repair of the instrument lines almost exclusively occur when the reactor is not in an operational mode to which the phenomenon described in IEB 93-03 is applicable or a concern. The station procedural controls governing the out-of-service process lessens the possibility of a valve manipulation error. The out-of-service process also ensures that the valves are properly returned to service. This administrative control is performed in conjunction with the usage of valve checklists that are performed prior to a unit startup. In addition, the status of the safety lock that will be installed on the valves is checked at the end of each refuel outage prior to a unit startup.

The primary concern is a mismanipulation of the valves while the unit is at power. This scenario is unlikely because these valves are located at the penetration where there are no normally operated valves. To further minimize the possibility of a valve error, the valves will be locked in the open position with a lock, the keys for which are administratively controlled. In addition, labels that clearly identify the valves will be provided at the valve location indicating that operation of the valves will result in a plant transient and that they are not to be operated without permission of shift supervision.

To further guard against mismanipulation, the operators and Instrument Maintenance Technicians will be trained on the location and purpose of the valves and on the consequences of closing the valves without first taking the backfill system out of service. Also, the process of taking the backfill system out of service and returning it to service will be administratively controlled by station procedures.

Training will be provided to the control room operators as part of the modification. This training will include directions concerning how to recognize the indications that the root valves have been mispositioned, and what actions to take to control a possible resultant transient.

Schedule

CECo requests review and approval of the proposed amendment to Facility Operating Licenses DPR-19, DPR-25, DPR-29, and DPR-30 prior to November 22, 1993 in order to support the current implementation schedule.

ATTACHMENT B

SIGNIFICANT HAZARDS CONSIDERATION

Commonwealth Edison has evaluated the proposed License Amendment and determined that it does not represent a significant hazards consideration. Based on the criteria for defining a significant hazards consideration established in 10 CFR 50.92, operation of Dresden and Quad Cities Stations in accordance with the proposed amendment will not:

- 1) Involve a significant increase in the probability or consequences of an accident previously evaluated because:

The addition of the backfill instrumentation piping does not significantly increase the probability of an accident previously evaluated due to the low probability of the inadvertent closure of the root valve(s). CECO has evaluated the estimated frequency of the inadvertent closure of the root valve(s) at approximately $1E-08$ per reactor year given the implementation of administrative controls. The resulting condition (valve mis-manipulation) cycles the Reactor Pressure Vessel in a similar manner as a plant LOCA (i.e., simulates LOCA conditions). The current (pre-modification) LOCA initiation frequency is predicted to be approximately $1E-04$ per reactor year. Therefore, the proposed modifications do not significantly increase the probability of any previously evaluated accident.

The consequences of any previously evaluated accident are not increased by the proposed modifications. For example, the consequence of closing the root valve for the reference leg from condensing chamber 12A, without first isolating the backfill injection, is the advertent pressurization of the reference leg resulting in the opening of the SRV and all Electromatic reliefs. This is equivalent to an inadvertent actuation of the automatic depressurization system (ADS) - an event that is not analyzed in the safety analysis as an initiating event. Regardless, the event is bounded by the recirculation line break analysis in terms of the RPV response. Because this event would release reactor inventory to the suppression pool, it has less significant consequence than other events previously analyzed for Dresden and Quad Cities Stations.

- 2) Create the possibility of a new or different kind of accident from any accident previously evaluated because:

For Dresden and Quad Cities Station, a spectrum of Loss-of-Coolant Accidents have previously been evaluated. The accident in question associated with the proposed modifications can be categorized as a LOCA

due to the resultant plant response following the initiating conditions. The previously analyzed LOCA analyses bound the conditions introduced by the proposed modifications. As such, the proposed amendment request for Dresden and Quad Cities Stations do not introduce any new or different kinds of accidents.

3) Involve a significant reduction in the margin of safety because:

The previously analyzed LOCA consequences bound the consequences introduced by the inadvertent closure of the root valve(s) and subsequent LOCA conditions. As such, the previously approved safety margin remains unchanged. Therefore, the proposed modifications do not significantly reduce the margin of safety for both Dresden and Quad Cities Stations.

The proposed amendment request does not involve a significant relaxation of the criteria used to establish safety limits, a significant relaxation of the bases for the limiting safety system settings, or a significant relaxation of the bases for the limiting conditions for operations. Therefore based on the guidance provided in the Federal Register and criteria established in 10 CFR 50.92(c), the proposed change does not constitute a significant hazards consideration.

ATTACHMENT C

ENVIRONMENTAL ASSESSMENT STATEMENT APPLICABILITY REVIEW

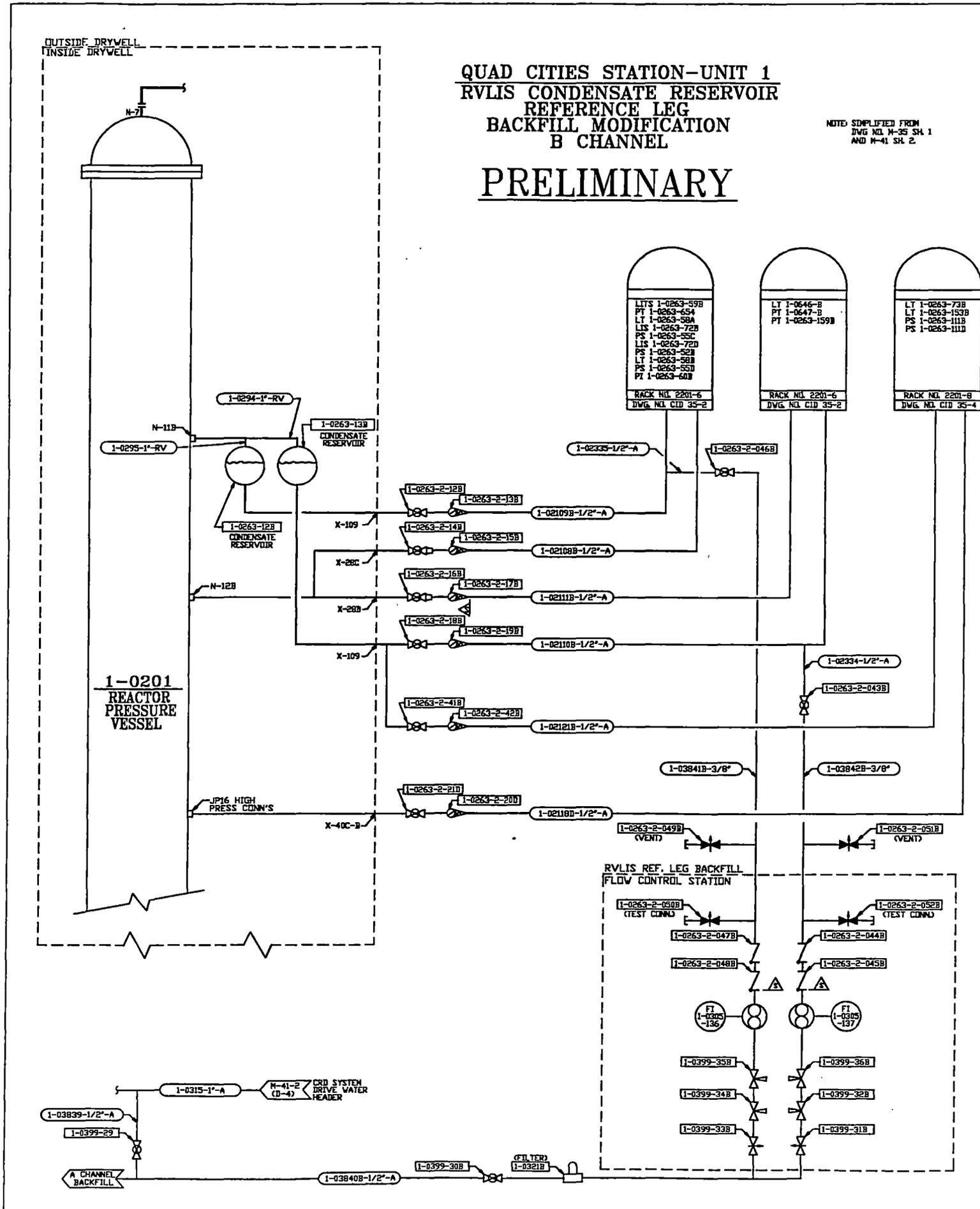
Commonwealth Edison has evaluated the proposed amendment against the criteria for identification of licensing and regulatory action requiring environmental assessment in accordance with 10 CFR 51.20. It has been determined that the proposed changes meet the criteria for a categorical exclusion as provided under 10 CFR 51.22(c)(9). This conclusion has been determined because the changes requested do not pose significant hazards considerations or do not involve a significant increase in the amounts, and no significant changes in the types, of any effluents that may be released off-site. Additionally, this request does not involve a significant increase in individual or cumulative occupational radiation exposure.

NOTE: THIS DRAWING IS CONSISTENT TO THE DRESDEN RVLIS DESIGN.

QUAD CITIES STATION-UNIT 1
 RVLIS CONDENSATE RESERVOIR
 REFERENCE LEG
 BACKFILL MODIFICATION
 B CHANNEL

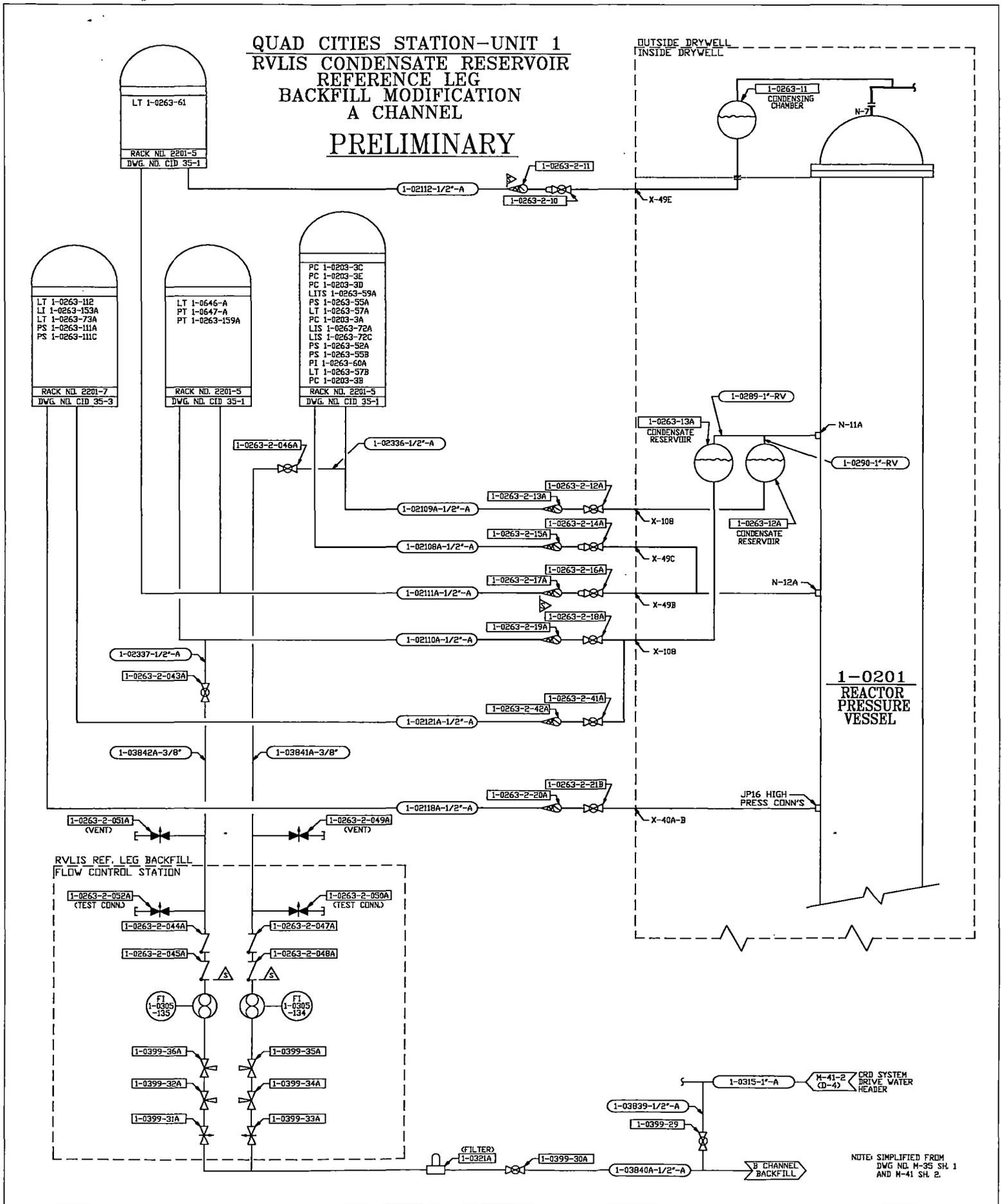
NOTE: SIMPLIFIED FROM
 DWG. NO. M-35 SH. 1
 AND M-41 SH. 2.

PRELIMINARY



NOTE: THIS DRAWING IS CONSISTENT TO THE DRESDEN RVLIS DESIGN.

QUAD CITIES STATION-UNIT 1
 RVLIS CONDENSATE RESERVOIR
 REFERENCE LEG
 BACKFILL MODIFICATION
 A CHANNEL
 PRELIMINARY



NOTE: SIMPLIFIED FROM
 DWG. NO. M-35 SH. 1
 AND M-41 SH. 2.