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January 13, 1994

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

Attn: Document Control Desk

Subject: Commonwealth Edison Co., LaSalle County Nuclear Power Station Unit 1 Supplemental Response to NRC Bulletin 93-03, "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs."
NRC Docket No. 50-373

References:

- (a) L. O. DelGeorge letter to T. E. Murley, dated September 15, 1993.
- (b) P. Piet letter to J. Zwolinski, dated December 6, 1993.
- (c) L. O. DelGeorge letter to T. E. Murley, dated July 30, 1993.

Dear Dr. Murley:

Commonwealth Edison Co. (CECo) committed to install the Reactor Pressure Vessel Backfill (RVLIS) Modifications to address the concerns discussed in NRC Bulletin 93-03 as documented in reference (a). The implementation schedule outlined a complete installation of the RVLIS modification during the first cold shutdown of LaSalle Unit 1 after December 1, 1993. For LaSalle Unit 2, the commitment was made to install the RVLIS modifications during the Unit 2 fifth Refuel outage, L2R05. The RVLIS modifications were installed in L2R05 as planned and continuous backfill has been in operation since L2R05.

The Unit 1 sixth refueling outage (L1R06) is scheduled to begin March 18, 1994. Due to degradation to one of the 1A Reactor Recirculation Pump Seals, it is necessary to enter a maintenance cutage prior to L1R06. The maintenance outage is scheduled to begin January 21, 1994 and will last approximately eight to ten days. This letter is being written to request your concurrence to delay completion of the Reactor Vessel Level Indication System (RVLIS) modifications until the March 1994 refueling outage.

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The maintenance outage schedule to replace the 1A Reactor Recirc Pump seals is shorter than that required to complete the backfill modifications. Specifically, the maintenance outage duration required to replace the pump seals and Reactor Safety Relief valves 1B21-F013B and 1B21-F013J is approximately eight to ten days. The maintenance outage length is based on the time required to replace Reactor Safety Relief valves 1B21-F013B and 1B21-F013J during the first Cold Shutdown prior to L1R06 as was committed in Reference (b). An outage to install the fuel zone level instrument reference leg modifications is 16 days and the outage duration to fully install and test the RVLIS modification is approximately 30 days, based on the sequential installation of the modifications. There are three RVLIS modifications (one for each Emergency Core Cooling System (ECCS) Division) for installation of Reference Leg continuous backfill. The fuel zone level instrument modifications are not backfill modifications, but the Division One Fuel Zone modification is a prerequisite for final connection of one of the Division One backfill lines to its associated reference leg utilizing piping abandoned by the Division one fuel zone modification. Division Two fuel zone is being modified at the same time for economics and to be consistent with Division One fuel zone for Human Factors considerations. During the outage, only one of the four major instruments racks can be worked on at a time due to instrument sensitivity, the need to keep at least two Emergency Core Cooling Systems Operable during Cold Shutdown (per Technical Specification 3.5.2), and the need to minimize Shutdown Risk. Irrespective of the occurrence of a maintenance outage, field work on this modification will continue, since approximately 40% of the installation work can be completed with the unit on line. This non-outage work is described in Attachment A and is currently estimated to be complete by February 1, 1994. Because the non-outage work on floor elevation 786' can be done in parallel with the outage work on floor elevation 761', there is no time savings in the 30 day outage scope based on the amount of work completed non-outage. This non-outage work schedule is being reviewed to finish as much of the non-outage work as possible prior to the maintenance outage scheduled to begin January 21, 1994.

If the maintenance outage is extended to install the RVLIS modifications, then it will result in a significant impact on the upcoming refuel outage. To ensure the required burn-up of the Unit 1 fuel, a unit restart would be required after an outage of any duration. The Unit would then be operated until the refueling outage. As of January 11th, it is approximately 66 days until the next scheduled refuel outage, L1R06. From a licensing issue only, 6 days of full power operation is needed to insure that the current reload will meet shutdown margin criteria. However, the operational impact of this short of a cycle would be unacceptable. Unless the cycle's fuel is burned for an additional 26 full power days, thermal limits next cycle

may not be able to be maintained within Technical Specification limits without seriously derating the unit. In addition, load following capabilities will be seriously restricted. Ideally, 45 days of power operation is required to minimize any operational impact next cycle and anything less will begin to affect the operational flexibility of Unit 1. Completion of the backfill modifications during a maintenance outage of this magnitude this close to refuel would potentially delay the start of the refueling outage.

The scope of work that can be performed during an eight to ten day maintenance outage on the RVLIS modifications is provided in Attachment B. Due to the sensitivity of the instrumentation and the need to maintain two Emergency Core Cooling Systems (ECCS) Operable when in Cold Shutdown, the outage schedule requires that the work be done in series, one of the four major instrument racks (panels) at a time. The requirement for two ECCS systems is met by either Division one or Division two ECCS. All other divisional work (not related to backfill) must also be scheduled to avoid conflict with the backfill work. The work that can be done during this outage does not involve tie-in to process lines. These factors regarding tie-in are discussed in Attachment C.

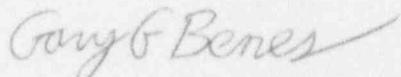
The compensatory measures that are in place for a planned or automatic shutdown and depressurization as described in Reference (c) are included in part as Attachment D. In addition, LaSalle Station will manually backfill the divisional reactor level instrument reference legs prior to Startup at the end of the maintenance outage. Based on observed instrument behavior, approximately 30 days or more of power operation is required to allow non-condensable gas collection in the condensing pots and subsequent diffusion to significant concentrations in the reference leg water. Therefore, with an eight to ten day maintenance outage, then only about 48 days or less of power operation would be left in the current fuel cycle. This represents a relatively short period of operation with reference legs containing concentrations of entrained gas. As LaSalle station has been doing since April of 1993, the periodic backfill of the Post Accident Wide Range level indications system will continue to be performed.

Therefore, CECO is proposing to revise the commitment to allow us to complete the RVLIS modifications during the upcoming Unit 1 sixth refueling outage. We will continue with a good faith effort towards modification installation during the planned maintenance outage. If the planned maintenance outage extends significantly beyond ten days, the scope of the planned RVLIS modification work will be re-evaluated.

Your review and concurrence of this commitment change is requested.

If you have any questions or comments, please direct them to this office.

Sincerely,



Gary G. Benes
Nuclear Licensing Administrator

Attachments:

- A. Non-Outage Backfill Modification Work Scope
- B. Eight to Ten Day Maintenance Outage Backfill Modification Work Scope
- C. Basis For Not Making Final Connections of Backfill Piping
- D. Compensatory Actions (per IEB 93-03) Until Backfill Modifications are Complete

cc: J. B. Martin, Regional Administrator -RIII
D. Hills, Senior Resident Inspector - NRC, LaSalle
A. T. Gody Jr., Project Manager - NRR

ATTACHMENT A

Non-Outage Backfill Modification Work Scope

NOTE: The following descriptions pertain to the four Backfill Local Flow Station racks (panels) and discharge piping for the four associated reference legs with active trip instrumentation. This work can be done with Unit 1 at power, because this work is on elevation 786' in the Unit 1 Reactor building, which is one floor above the CRD drive water header and the sensitive main divisional instrument racks. The percentages shown represent about 40% of the total piping installation work, if all piping work described is completed. Three of the RVLIS modification work packages will not be ready for field installation work until the first part of the week beginning January 17, 1994. Therefore, not all of the non-outage work can be completed prior to the start of the January 21, 1994 maintenance outage.

ESF Division 1: Panel 1C11-P005 will be mounted and the discharge piping and pipe supports will be installed except for the piping in a High Radiation area and the final connection. This will install about 85% of the backfill discharge piping and supports which is between this backfill panel and the associated reference leg. (No tie-ins)

The last 15% of this piping is installed after the piping changes associated with Division one of the Fuel Zone instrumentation modifications are complete. This backfill line uses part of the piping abandoned by the Division one fuel zone modification.

ESF Division 3: Panel 1C11-P004 will be mounted and the discharge piping and pipe supports will be installed except for the final connection. This will install about 95% of the backfill discharge piping and supports which is between this backfill panel and the associated reference leg. (No tie-ins)

- ESF Division 3: Panel 1C11-P002 will be mounted and the discharge piping and pipe supports will be installed except for the final connection. This will install about 95% of the backfill discharge piping and supports which is between this backfill panel and the associated reference leg. (No tie-ins)
- ESF Division 2: Panel 1C11-P003 will be mounted and the discharge piping and pipe supports will be installed except for the final connection. This will install about 95% of the backfill discharge piping and supports which is between this backfill panel and the associated reference leg. (No tie-ins)
- ESF Division 1: The Fuel Zone Reference Leg change modification new piping will be about 80% installed (No tie-ins).

ATTACHMENT B

Eight to Ten Day Maintenance Outage Backfill Modification Work Scope

NOTE: The actual order of work and scope will depend on the station schedule for the given week that shutdown occurs. The work schedule at LaSalle Station involves separating system work so that only one ESF Division is available for scheduled maintenance, surveillances, and other divisional work in the first few days of a given week. The RVLIS modification work will be performed on one of the four main instrument racks at a time. As a result, the piping installation work on the 761' elevation described below may not be able to be completed in an eight to ten day outage. The percentages shown represent about 40% of the total piping installation work for the modifications, if all of the piping installation work described is completed. The work described is all on the 761' elevation in the Unit 1 Reactor building.

The work on this floor elevation (761') can only be performed on one of the four instrument racks at a time due to the sensitivity of the instrument racks and the close proximity of the work to the instrument racks. Also, two ECCS systems (either Division one or Division two ECCS) are required to be Operable during Cold Shutdown.

ESF Division 1: (Post Accident Indication only)	Panel 1C11-P007 will be mounted and the inlet (supply) and discharge piping and pipe supports will be installed except for the final connections. This will install about 90% of the backfill inlet and discharge piping and supports. The inlet piping is between the CRD system tie-in and this backfill panel. The discharge piping is between the associated reference leg (no tie-in) and this backfill panel.
ESF Division 2: (Post Accident Indication only)	Panel 1C11-P006 will be mounted and the inlet (supply) and discharge piping and pipe supports will be installed except for the final connections. This will install about 90% of the backfill inlet and discharge piping and supports. The inlet piping is between the CRD system tie-in and this backfill panel. The discharge piping is between the associated reference leg (no tie-in) and this backfill panel.

ESF Division 2: The Fuel Zone Reference Leg change modification new piping will be about 80% installed (no tie-ins). This modification is not a backfill modification.

Scaffolding will be installed to allow CRD supply piping as-built configuration verification.

ESF Divisions 1, 2, and 3: The supply (inlet) piping and supports will be verified and installed as time allows on the 761' elevation (with no tie-ins) for Backfill Local Flow Station Racks (Panels) 1C11-P002, 3, 4, and 5, as divisional windows allow during the outage. The inlet piping is between the CRD system tie-ins and these backfill panels.

Attachment C

Basis for Not Making Final Connections of Backfill Piping

The planned eight to ten day maintenance outage prior to the LaSalle Unit 1 Sixth Refuel outage (L1R06), would need to be extended from the beginning of the outage to be an approximately 30 day outage to complete the RVLIS modifications for continuous backfill to the reference legs. The installation work described in Attachments A and B is included in the scope of work as well as the final system tie-ins. Because the non-outage work on elevation 786' can be done in parallel with the outage work on elevation 761', there is no time savings in the 30 day outage scope based on the amount of work completed non-outage. Due to the need to maintain two ECCS systems (either Division one or Division 2 ECCS) Operable during Cold Shutdown, the testing and installation must also be performed by division, which may involve more time than is shown below.

Shown below, in section 1, is the scope of testing based on the testing performed for the LaSalle Unit 2 RVLIS modifications. The Unit 2 testing was not performed by division as Unit 1 will be, so actual Unit 1 total testing times may be longer. Section 2 describes the CRD system recovery and Section 3 reflects administrative work created if only a portion of the RVLIS modifications were to be installed.

1. The extensive modification testing is required for completion of backfill to each reference leg. The following testing is required to make the backfill lines operable (this is approximately the total time for all 6 backfill lines):
 - a. Fill and vent the panels and new piping. For each backfill line this requires valving out all of the instrumentation connected to the associated reference leg. - 46 hours
 - b. Check Valve Leak Rate Tests, both water and air leak rate tests of the isolation check valves (two per reference leg). The air test is a 10 CFR 50, Appendix J Type A test and is required for 8 of the 12 backfill line check valves that are Primary Containment Isolation valves. The water test is a leak rate test for all 12 check valves to assure the safety-related/non-safety-related piping boundary is maintained.
- 40 hours
 - c. Backfill Local Flow Station Rack flowmeter functional Tests. - 30 hours
 - d. Recalibration of reactor level instrumentation for RPS

level 3 (scram and isolation), HPCS level 8 (high level trip), RCIC level 8 (High level trip), and Feedwater level 8 (trips main turbine and feedwater pumps). - 64 hours (4 major instrument racks involved)

- e. Backfill panel startup and operability testing.
 - 40 hours
- f. New welds leak test. - 16 hours

These test times are based on the testing performed on the unit 2 backfill modifications, which would take longer during a maintenance outage due to the need to perform work on one division at a time.

- 2. Final Connection to the CRD drive water piping requires that the CRD System be shut down and the associated piping drained. There is a separate tap for each backfill line and the effects on the CRD system are the same whether one or all connections are made. CRD System recovery requires approximately 3 to 4 days of control rod venting to get all the air out of the system, so the control rods move smoothly. Venting of Control Rods requires withdrawing and inserting each control rod several times during the venting process. This can only be performed one Control Rod at a time. The venting procedure requires a licensed reactor operator for control rod movement and two equipment attendants for manual valve manipulation 24 hours a day during this time. The associated CRD work is currently planned to be the first part of the backfill tie-ins to maximize the amount of time available for CRD system recovery.
- 3. The drawing changes and procedure changes associated with the backfill modifications and the fuel zone instrumentation reference leg modifications are interrelated. Performing any part without performing all would involve reissuing engineering documents and multiple revisions to some of the drawings and procedures, including the EOPs.

Attachment D

Compensatory Actions (per IEB 93-03) Until Backfill Modifications
are Complete

- (a)1. "Establish enhanced monitoring of all RPV level instruments to provide early detection of level anomalies associated with de-gassing from the reference legs."

LaSalle Station has established enhanced monitoring of the RPV level instruments during reactor shutdown activities when the effects of reference leg de-gassing have the potential to cause reactor level indication offsets. Prior to commencing planned shutdowns, a philosophy of Heightened Level of Awareness (HLA) has been established which emphasizes the need of monitoring reactor level indications for abnormalities during reactor vessel depressurization and the significance in regard to activities with the potential to drain the reactor vessel. Special Operating Procedure LLP-93-050, "Rx Water level Notching Determination During Rx Vessel Depressurization", has been written and functionally verified during a scheduled unit shutdown, to enable the Operating staff to determine when reference leg degassing has occurred on a level instrumentation channel. This procedure monitors and compares the individual narrow range level indications against an established criteria (detected notching of greater than 6 inches for more than 5 minutes) which ensures that all design basis protective actions will be met for all associated instrumentation of the reference leg. The basis for this criteria was provided in Reference (c)).

The philosophy of heightened awareness of activities with the potential to drain the reactor vessel in conjunction with the enhanced monitoring ensures that abnormal reactor level conditions will be observed and proper corrective action taken. The unit shutdown procedure LaSalle General Procedure LGP 2-1, has been revised to require initiation of the special monitoring and awareness actions as described above.

- (a)2. "Develop enhanced procedures or additional restrictions and controls for valve alignments and maintenance that have a potential to drain the RPV during Mode 3."

LaSalle Station has performed a review of Operating Procedures that are used prior to entering mode 3 and while in Modes 3, 4, and 5 that have a potential to drain the RPV. The result of the review confirmed that administrative controls have been established to ensure that valve alignments and maintenance with the potential to drain the vessel are properly controlled.

Automatic interlocks are provided on the Residual Heat Removal (RHR) system to prevent the opening of the RHR Shutdown Cooling suction valve while the RHR Suppression Pool suction valve is open, as well as preventing the RHR Suppression Pool suction valve from opening when the other suction valve is open. The RHR Full Flow Test and Suppression Pool Spray valves are administratively controlled in the closed position with the valve breakers open prior to the suction path from the reactor vessel being established.

Because the RHR system is safety related, these out-of service (OOS) administrative controls are second verified in addition to the normal OOS tags which are placed on the control room handswitch, the motor power supply breaker, and the valve handwheel. The location of this required OOS in the procedure sequence, and its resultant de-energization of the valve power supplies, ensures that the valves cannot be inadvertently operated from the control room.

The procedures provide the operator with sufficient guidance on valve operation, interlocks, precautions, and controls to prevent inadvertent drain down of the RPV. As administrative protection from improper maintenance or work group activities (contractors), a licensed operations supervisor reviews all proposed work activities with the work crew leader. The Operations/Work Group interaction further reduces the probability of improper actions by assuring that the work group understands the location of equipment and limitations of activities to be performed.

- (a)3. "Alert operators to potentially confusing or misleading level indication that may occur during accidents or transients initiating from Mode 3. For example, a drain-down event could lead to automatic initiation of high-pressure emergency core cooling systems (ECCS) without automatic system isolation or low-pressure ECCS actuation."

LaSalle Station Training Department has conducted classroom training on the de-gassing issue and the effects on indicated level. Included in this training was an in-depth discussion on the principles of reference leg de-gassing and the effects on level instrumentation as well as the corrective actions for reference leg de-gassing.

Other training included shift briefings, daily operating orders, and licensed required reading. The training was initially prompted by Generic Letter 92-04, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(f)," in which the primary concern was rapid depressurization of the RV during an accident. A lab exercise was developed on the LaSalle Simulator which covered level anomalies during execution of Emergency Operating Procedures (EOPs). These exercises served to validate and develop the EOP Committee's evaluation of de-gassing effects on EOP execution, as well as familiarize operators with these effects. All active licensed personnel were trained on this exercise during 1993 First Quarter Training.

The focus of IEB 93-03 is more concerned with the de-gassing that may occur during normal depressurization. The enhanced training that was given to the licensed operators contained training on the recognition of de-gassing during normal unit shutdown as well as the determination of level inaccuracies during transient events. As with the rapid blowdown case, a simulator lab and exercise was developed and implemented which demonstrated the conditions where loss of level instrumentation occurs during a unit shutdown with a reactor vessel draindown event in progress, resulting in failure of the required RHR Shutdown Cooling isolation. All personnel with active RO and SRO licenses have completed this training.

- b) "By July 30, 1993, each licensee is requested to complete augmented operator training on loss of RPV inventory scenarios during Mode 3, including RPV drain-down events and cracks or breaks in piping."

LaSalle Station has developed an augmented training module for Licensed Operators to sensitize the operators to the conditions and actions required during normal and transient depressurizations of the RPV. The enhanced training module was completed by July 30, 1993 for all Licensed Operators at LaSalle.

Also, LaSalle performs periodic backfill of all channels of the Post Accident Wide Range level indication system during power operation. The periodicity of this backfill is based on engineering and test data and data collection needs, and is currently performed approximately every 30 days. The intent of these backfills is to maintain the affected level instrument legs with an insignificant gas inventory, thereby minimizing the potential for de-gassing related indication anomalies. The backfill procedure methods and periodicity are reviewed and approved by the site On-Site Review function.

Prior to each planned unit 1 shutdown, the Heightened Level of Awareness (HLA) program will be activated to review the required monitoring and controls.

The Division 2 ("B" channel) will be backfilled prior to reactor pressure being reduced to less than 450 psig during controlled shutdowns, due to observed notching during previous shutdowns without backfill.