Commonwealth Edison Company
1400 Opus Place
Downers Grove, IL 60515

November 14, 1995

ComEd

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555

Attention: Document Control Desk

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
LaSalle County Station Units 1 and 2
Response to NRC Bulletin 95-02
"Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode"
NRC Dockets 50-237 and 50-249
NRC Dockets 50-254 and 50-265
NRC Dockets 50-373 and 50-374

References: 1) BWROG-95083 Letter dated September 29,1995

The purpose of this letter is to provide ComEd's response to the subject NRC Bulletin for Dresden Station Units 2 and 3, Quad Cities Station Units 1 and 2 and LaSalle County Station Units 1 and 2. Details of each Station's response is provided in the attachments to this letter. However, a brief summary of ComEd's actions is described below:

Dresden Station Units 2 and 3

Unit 2 is currently in a refueling outage and a complete torus/ring header desludging and water filtration was performed. Inspections were performed and documented with pictures and video. In addition, a multiple ECCS pump test will be run and a diver will inspect the ECCS Suction Strainers prior to start up from the refueling outage.

Unit 3 returned to service from a refueling outage which began in late 1994. During that outage a complete torus/ring header desludging and water filtration was performed. In addition, a multiple ECCS pump test was performed in October 1995 with an insignificant change in ECCS pump suction pressure. Based on this pump test and our past practice of torus cleaning during refueling outages strainers will not be inspected until the next outage of sufficient duration but no later than the next scheduled refueling outage.

Quad Cities Station Units 1 and 2

During Unit 1's last refueling outage when the torus

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underwent a complete torus recoating. The water was drained, the walls and floor hydrolyzed, all surfaces sandblasted and repainted. The torus was then refilled with clean demineralized water. A complete drywell cleaning was performed and a close-out inspection of the Drywell and Torus was performed. In addition, on October 26, 1995 a multiple ECCS pump test was performed and 2 of the 4 suction strainers inspected. Both were found to be completely free of debris.

This year,during Unit 2's refueling outage, the torus was completely drained, the walls and floor hydrolyzed and refilled with demineralized water. Again a close-out inspection of both the drywell and torus was performed. In addition, on October 27, 1995, a multiple ECCS pump test was performed and no decrease in suction pressure was observed.

LaSalle County Station Units 1 and 2

Unit 1 pressure suppression pool (PSP) suction strainers were inspected during the last refueling outage in 1994. Also at that time an inspection for, and removal of, all PSP foreign material was performed. We believe that Unit 1 resumed operation with strainers which met or exceeded the BWROG recommendations (Reference 1). In addition, RHR pumps were run in the PSP cooling mode for approximately 35 and 20 hours in September of this year due to a scram of the unit. Review of the pump data found no degradation. Unit 1 will be in its refueling outage within 120 days of the Bulletin when a multiple ECCS pump test will be performed to determine PSP water cleanliness. Furthermore, the PSP will be cleaned (desludged) and inspected in that outage.

Unit 2 pressure suppression pool (PSP) suction strainers were inspected during the last refueling outage (Spring 1995). At that time an inspection for, and removal of, all PSP foreign material was performed. Unit 2 resumed operation after that outage with strainers which met or exceeded the BWROG recommendations (Reference 1). Within 120 days a multiple pump test will be performed and suction pressure monitored for degradation in suction pressure. The PSP will be cleaned (desludged) and inspected in Unit 2's next refueling outage scheduled for fall of 1996.

Other Actions

Foreign Material Exclusion (FME) practices have been enhanced at all of these sites, developed in response to NRC Bulletin 92-02 and Bulletin 93-02 Supplement 1 and in place since at least late 1994. We feel that these FME practices provided reasonable assurance that no foreign material remains in the torus/suppression pool.

Recent In-Service Testing (IST) Quarterly ECCS pump surveillance data has been reviewed and no degradation has been observed.

Pool cleaning will be dictated by our past history in that area for each unit. Pool cleaning frequency will be decided based on plant specific resolution of the final version of the draft Bulletin and Reg Guide on this issue.

To the best of my knowledge and belief, the statements contained in this document are true and correct. In some respects these statements are not based on my personal knowledge, but on information furnished by other ComEd employees, contractor employees, and/or consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

If there are any questions or comments, please contact Bob Rybak of my staff at (708) 663-7292.

Sincerely,

Irene Johnson

Irene Johnson
Licensing Operations Director

OFFICIAL SEAL
MARY JO YACK
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 11/29/97

Mary Jo Yack 11-14-95

Attachments: Attachment A: Dresden Station Submittal
Attachment B: Quad Cities Station Submittal
Attachment C: LaSalle Station Submittal

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ATTACHMENT A

Dresden Nuclear Power Station response to NRC Bulletin 95-02, dated October 17,1995,"Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode."

Dresden (BWR-3, Mark I Containment) is configured such that the ECCS Pumps, LPCI and Core Spray, take suction from the torus via a common ECCS ring header. This common header is connected to the torus with four lines, each having a strainer which passes 10,000 gpm flow. The strainers are sized to screen out particles greater than 1/8".

Action 1

Verify the operability of all pumps which draw suction from the suppression pool when performing their safety functions (e.g., ECCS, containment spray, etc.), based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.

Unit 2

Unit 2 is currently in a refueling outage, and a complete torus desludge was performed. Torus water cleanup was also performed using an underwater filtration system with one micron filters. Additionally, the suction strainers were removed and cleaned, and the ECCS ring header was desludged. Inspections were performed and documented with pictures and video.

The Low Pressure Coolant Injection and Core Spray pumps are verified operable prior to start up. Core Spray pump operability is verified by performance of DOS 1400-01, "Core Spray System Pump Test with Torus Available", or DOS 1400-05, "Core Spray System Pump Test with Torus Available for the Inservice Testing (IST) Program". LPCI pump operability is verified by performance of DOS 1500-10, "LPCI System Pump Operability Test with Torus Available and In-Service Test (IST) Program".

Inspections are scheduled to be performed just prior to torus/drywell close-out, and will be performed in accordance with procedures DOS 1600-19, "Suppression Chamber Closeout Inspection", and DOS 1600-10, "Drywell Closeout Inspection Plan". As part of these procedures, the Drywell Vents, Vent Header, and Downcomers off the Vent Header are visually inspected for debris. Additionally, a diver will inspect the Torus and ECCS Suction Strainers to assure that no debris collected from the pump runs.

Unit 3

Unit 3 returned to service from a refueling outage late in 1994. During that outage a complete torus desludge was performed. Additionally, the suction strainers were removed and cleaned, the ECCS ring header was desludged, and a torus water cleanup was performed using an underwater filtration system with one micron filters. Pumps were run for operability, and inspections were performed just prior to Drywell/Torus closeout (as described above for Unit 2) to verify that they were free from debris.

The Core Spray and Low Pressure Coolant Injection pumps are verified operable by performance of DOS 1400-05 "Core Spray System Pump Test with Torus Available for the Inservice Testing (IST)

Program", and DOS 1500-10, "LPCI System Pump Operability Test with Torus Available and In-Service Test (IST) Program", respectively. There has been no indication of abnormal system pressures or flows.

LPCI was run for approximately 5 continuous days during start up from the most recent forced outage (October 1995) with no flow irregularities. The Torus was not entered during this forced outage, and very little Drywell work was performed. However, the Drywell Vents, Vent Header, and Downcomers off the Vent Header were inspected to verify that no debris was present.

Based upon the above, it is concluded that all ECCS pumps drawing suction from the torus are operable for both Dresden Unit 2 and Unit 3.

Action 2

The operability evaluation in requested action 1 above should be confirmed through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.

Unit 2

Prior to start up from the current refueling outage, Dresden will perform DOS 1500-10, "LPCI System Pump Operability Test with Torus Available and In-Service Test (IST) Program", or other approved procedure for 3 ECCS pump operation. This test will run three pumps at a time in multiple combinations, with a circulation flow rate of approximately 14,500 gpm. The pumps will be run for a sufficient time (about 4 hours) to assure four (4) complete turnovers of torus water inventory. Pump suction/discharge pressure and system flow rate will be monitored, and upon completion of the test, the strainers will be inspected and verified free of debris. A report summarizing the results of the test and inspection will be submitted within ten days after the return to service from the refueling outage.

Unit 3

Currently, Unit 3 is in a short forced outage (D3F20) with primary containment inerted. On November 1, 1995, LPCI was aligned for 3-pump operation in accordance with DOS 1500-05, "LPCI System Quarterly Flow Rate Test", and the pumps were run for an extended duration of six hours, approximately six torus water inventory turnovers. Pump suction pressure and flow was trended for the duration of the test with no decrease in flow rate and insignificant change in suction pressure. Based on the extended pump test and the practice of torus cleaning during refueling outages, the strainers will not be inspected until the next outage of sufficient duration.

Action 3

Schedule a suppression pool cleaning. The schedule for cleaning the pool should be consistent with the operability evaluation in requested action 1 above. In addition, a program for periodic cleaning of the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.

Unit 2 and Unit 3

Given our past record of torus cleanings, Dresden will commit to the inspections and tests in accordance with BWROG letter 95083, Item 3. A procedure will be initiated to establish the method and acceptance criteria for determining the appropriate cleaning frequency. Performance of this procedure will be tracked as a GSRV Item. These actions will be performed during the next refueling

Guide on this matter will be finalized in 1996, and at that time, appropriate commitments will be made regarding scheduled torus pool inspection, test(s) and cleaning.

Action 4

Review FME procedures and their implementation to determine whether adequate control of materials in the drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and whether workers are sufficiently aware of their responsibilities regarding FME. Any identified weaknesses should be corrected. In addition, the effectiveness of the FME controls since the last time the suppression pool was cleaned and the ECCS strainers inspected, and the impact that any weaknesses noted may have on the operability of the ECCS should be assessed.

Administrative procedure DAP 03-23, "Foreign Material Exclusion Program" identifies the controls in place to prevent FME. Training is conducted on FME area designation levels, and the controls required for the different levels. FME devices are now readily available for use, and all work packages address the required review for FME controls. Worker awareness is heightened for any activity that requires the use of FME practices, especially for any activity that has the potential for foreign material being introduced into or communicates with the RPV or torus.

Dresden has greatly enhanced its FME program over the past year. One of the actions required as a result of this effort was the installation of FME covers over the drywell vent missile shields. These covers greatly reduce the potential for drywell material entering the vent lines during outage related work. This action has proven highly successful and will be duplicated on Unit 3 during the next outage.

Dresden is continually striving to improve upon our FME program. One such planned action is to modify our present FME procedure to implement the corporate guidance listed in the standardized maintenance procedure SMP-M-04. The procedure will not however be the centerpiece of our program. As part of Dresden's craft training, a day long training course will be conducted to address FME work practices. This training, more than procedures, will prevent practices which could lead to adverse conditions in the torus, and increase worker awareness of the FME concern.

Action 5

Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.

All torus water samples are taken from the low Pressure Coolant Injection (LPCI) System or Core Spray System. The suppression pool (torus) is the normal water supply to the LPCI and Core Spray Systems. The Emergency Core Cooling System (ECCS) flow path is from the torus, through the ECCS suction strainers and into the ECCS Suction Ring Header. All Low Pressure ECCS pumps draw suction from the ECCS Ring Header. When the ECCS flow passes through the suction strainers fibers can be deposited on the strainer, therefore any sample taken from these systems will not contain an accurate concentration of material contained in the torus water. Since the samples will not be representative of materials contained in the torus water, the station will not commit to implementation of suppression pool sampling. If primary containment is not required, a visual inspection of the torus strainers is the preferred method of determining strainer plugging.

The station currently records Low Pressure Coolant Injection pump suction and discharge pressure as required by Dresden Operating Procedure (DOS) 1500-10, LPCI System Pump Operability Test With Torus Available and Inservice Test (IST) Program. The system operability portion of the surveillance requires each of the four (4) LPCI pumps to be operated for five minutes before the data (including pump suction pressure) is recorded. The inservice test (IST) portion of the test requires static and dynamic suction pressure data.

Core Spray system pump test with torus available for the inservice test (IST) program (DOS 1400-5) is performed quarterly. Each core spray pump static suction pressure is read from a local gauge and recorded on the procedure. Each Core Spray pump is started and run for 15 minutes then the dynamic suction pressure is recorded using the same local gauge that the static suction pressure was read from.

The System Engineer will create an electronic surveillance program to review the suction pressure data, and review the data for adverse pressure trends quarterly, pending final resolution of the ECCS suction strainer plugging problem. This review will be tracked on GSRV or a replacement surveillance tracking system.

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Attachment B

Quad Cities Nuclear Power Station response to NRC Bulletin 95-02 dated October 17, 1995, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode."

ACTION 1: VERIFICATION OF PUMP OPERABILITY

1) Verify the operability of all pumps which draw suction from the suppression pool when performing their safety functions (e.g., ECCS, containment spray, etc.), based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.

Response:

Quad Cities (BWR-3, Mark I Containment) has evaluated and verified the operability of all pumps which draw a suction from the suppression pool (torus) while performing their safety function for Units 1 and 2. Quad Cities is configured to normally take the Residual Heat Removal (RHR) and Core Spray (CS) suctions from a common Emergency Core Cooling System (ECCS) Suction Header. High Pressure Coolant Injection (HPCI) and Reactor Core Isolation Cooling (RCIC) normally take suction from the Contaminated Condensate Storage Tank (CCST) but may be aligned to take a suction from the common ECCS Suction Header on high torus water level or low CCST water level. RHR and CS may alternately be manually aligned from the CCST instead of the ECCS Suction Header. Section 6.3.2.1.2 of the Quad Cities UFSAR states, "Water from the pressure suppression pool to the pumps' suction is taken from a common ring header that has four suction lines with stainless steel screens located in the suppression chamber. These screens are positioned above the bottom of the suppression pool but well below the pool surface to minimize any risk of plugging from debris. Sufficient flow area is available to meet the flow requirements of the combined use of the core spray subsystem, the LPCI subsystem, the HPCI subsystem (and the RCIC system) with one completely plugged suction screen. Screen size (1/8 inch openings) has been selected to screen out particles capable of plugging spray nozzles."

At Quad Cities, material which would cause plugging of the ECCS suction strainers would have to come from the Drywell, unless material was left in the torus from the

previous outage. The material would have to take a circuitous flow path from the Drywell to the ECCS suction strainers. The flow path from the Drywell leads through the 1 by 1.5 foot openings of the jet deflector plates through the 6 foot 9 inch vent lines. Inside the torus, the vent lines connect to large spherical shells that are interconnected by the 4 foot 10 inch diameter inner torus ring header. From this header, the path to the torus is through a total of 96 downcomers, each 24 inches in diameter, that extend below the water line. The path then proceeds through the large torus volume to the four suction strainers, located about 1/3 of the water level height above the bottom of the suppression chamber. The path provides many places to trap foreign objects, and would spread the particles that do get through uniformly throughout the torus volume.

Inerting of the Containment atmosphere with nitrogen also leads to less corrosion products available for the potential to plug the strainers. The strainers are made from stainless steel having perforations of 1/16 inch effective area. The actual hole size is 1/8 inch, but with the geometry of the arrangement of the holes, the effective area of the strainer is 1/16 inch. To account for the possibility of plugging of a strainer, hydraulic design of the ECCS is based on the simultaneous operation of all ECCS equipment at full rated flow and 100% plugging of one of the four strainers, plus 1 foot of head loss across each of the remaining strainers. The design basis of the strainers is:

- Each strainer shall pass 10,000 gpm with an entrance head loss across the screen of one foot of water maximum.
- The strainers are cylindrical and sized to remove particles greater than 1/8 inch in diameter.
- The strainers are in areas of minimum water turbulence (not directly under a downcomer).

The average water velocity in the torus during ECCS equipment operation is less than 0.1 ft/sec, which is not sufficient to transport material except the smaller particles in suspension. However, during a blowdown from the Drywell to the torus, the torus will be agitated and a certain portion of contaminants will be transported to the suction strainers. The effective flow area of the strainer may be reduced.

For long term ECCS operation, not all of the ECCS pumps would be required to remove decay heat. For the immediate post-accident time period, two LPCI pumps and one core spray pump would be sufficient. On a long term basis, satisfactory cooling could be accomplished with one LPCI pump and one core spray pump.

In summary, there are relatively few sources of potentially damaging material, and the amount of contaminants is small compared to the torus water volume. Furthermore, it is difficult for contaminants to reach the suction strainers. These considerations have led to the conclusion that the probability of torus contamination creating a safety problem is extremely remote.

Quad Cities Unit 1

All of the Unit 1 Suppression Pool Strainers were last inspected during Q1R13 from June 6, 1994 to August 12, 1994. During that outage, the suppression pool was completely drained, the walls and floor of the pool hydrolyzed, all surfaces were sandblasted to bare metal, and new protective coatings applied. The suppression pool was refilled with fresh demineralized water. The inside of the vent lines and the vent header were also coated. Video of the inside vent header and suppression pool was taken before and after the coating project. Each of the CS and RHR pumps were run and then inspections of the suppression pool and suction strainers were performed. No debris was found that would have affected the operability of the ECCS pumps. In August of 1994, a complete cleaning of the Drywell and a close-out inspection was performed of the Drywell and Torus to assure that no debris was left in these areas.

All in-service testing (IST) quarterly ECCS pump surveillance data generated since the Q1R13 outage has been reviewed. Pump suction pressure records were verified to remain at an value well above the required Net Positive Suction Head (NPSH). No degradation was identified.

An enhanced foreign material exclusion (FME) program, developed in response to NRC Bulletin 93-02 and Bulletin 93-02, Supplement 1, has been in place since August, 1994. During outages, the Drywell and Torus are classified as a Zone 1 FME area, meaning that all material brought into the areas must be logged in and accounted for on exit. If the work is extensive, then the areas may be released to a Zone 3 FME controlled area but then a close-out inspection of the area is required.

Based upon all of the above, it was concluded that all pumps which draw suction from the suppression pool while performing their safety functions for Quad Cities Unit 1 are currently OPERABLE.

Quad Cities Unit 2

On March 6, 1993, Unit 2 during routine testing of the Electromatic Relief Valves (ERV), valve 2-203-3E failed to close. At the time Unit 2 was at 71% power. The reactor was manually scrammed. The relief valve did not reseat until the reactor had depressurized to 193 psig. Suppression Pool Cooling was immediately started and no suction problems were detected.

All of the Unit 2 Suppression Pool Strainers were last inspected during Q2R13 in June, 1995, prior to adding water to the pool. During that outage, the suppression pool was completely drained, the walls and floor of the pool hydrolyzed, and new patchwise protective coatings applied. The suppression pool was refilled with fresh demineralized water. Each of the CS and RHR pumps were run and then inspections of the suppression pool was performed. No debris was found that would have affected the operability of the

ECCS pumps. In August of 1995, a close-out inspection was performed of the Drywell and Torus and the necessary action taken to assure that no debris was left in these areas.

All in-service testing (IST) quarterly ECCS pump surveillance data generated since the Q2R13 outage has been reviewed. Pump suction pressure records were verified to remain at a value well above the required Net Positive Suction Head (NPSH). No degradation was identified.

An enhanced foreign material exclusion (FME) program, developed in response to NRC Bulletin 93-02 and Bulletin 93-02, Supplement 1, has been in place since August, 1994. During outages, the Drywell and Torus are classified as a Zone 1 FME area, meaning that all material brought into the areas must be logged in and accounted for on exit. If the work is extensive, then the areas may be released to a Zone 3 FME controlled area but then a close-out inspection of the area is required.

Based upon all of the above, it was concluded that all pumps which draw suction from the suppression pool while performing their safety functions for Quad Cities Unit 2 are currently OPERABLE.

ACTION 2: CONFIRMATION OF OPERABILITY

2) The operability evaluation in requested action 1 above should be confirmed through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.

Response:

Quad Cities Unit 1

On October 26, 1995, a multiple pump test was performed in order to confirm the operability of the ECCS Suction Strainers. QCOP 1000-9, "Torus Cooling Startup and Operation" was run simultaneously with QCOS 1400-4, "Monthly Core Spray Pump Operability Test". Two RHR pumps and one CS pump were run at rated flow for 6 hours. Total flow was 13,700 gpm and resulted in 5.86 pool turnovers. The suction pressure on each pump was measured at the beginning of the test and at the end of the test. No decrease in suction pressure was observed. On November 1, 1995, a diver was used to inspect two of the ECCS suction strainers and the floor of 5 of the 16 Suppression Pool Bays. The strainers, located in bays 8 and 12, were found to be absolutely clean, with no indications of any buildup of fiber or debris from the extended multi-pump test. The sludge film thickness on the interior of the Torus in bays 8 through 12 was noted to be approximately 1/32 of an inch after 14 months of operation.

The only mechanism for debris or fiber to enter the Suppression Pool would be for the material to be left in the Pool prior to filling it or from material entering the pool from the

systems that communicate with the Suppression Pool. The Foreign Material Exclusion (FME) program should minimize the possibility of this occurring. In addition, the CS and RHR return lines to the Suppression Pool have anti-cavitation trim installed in them. The passageways and labyrinth flow paths within these valves are nearly the same size of the Suction Strainer openings. Foreign material in these systems would be detected in these valves prior entering the Suppression Pool. The position of these valves, that results in a referenced amount of flow, is trended on a quarterly basis to determine if debris is building up inside these valves.

During in-service testing (IST) quarterly ECCS pump surveillances, pump suction pressures are recorded and trended to provide indications of strainer blockage.

A full inspection of the Suppression Pool and ECCS Suction Strainers will be performed during Q1R14 which is scheduled to begin in February, 1996. The actual testing and inspection of the suction strainers will be performed at the end of the outage just prior to torus close out. With this outage starting within 120 days of the date of the Bulletin and with the testing and strainer inspections performed on November 1, 1995, it is concluded that the intent of the Bulletin is being satisfied and that the ECCS Suction Strainers are operable.

Quad Cities Unit 2

The only mechanism for debris or fiber to enter the Suppression Pool would be for the material to be left in the Pool prior to filling it or from material entering the pool from the systems that communicate with the Suppression Pool. The Foreign Material Exclusion (FME) program should minimize the possibility of this occurring. In addition, the CS and RHR return lines to the Suppression Pool have anti-cavitation trim installed in them. The passageways and labyrinth flow paths within these valves are nearly the same size of the Suction Strainer openings. Foreign material in these systems would be detected in these valves prior entering the Suppression Pool. The position of these valves, that results in a referenced amount of flow, is trended on a quarterly basis to determine if debris is building up inside these valves.

On October 27, 1995, a multiple pump test was performed in order to confirm the operability of the ECCS Suction Strainers. QCOP 1000-9, "Torus Cooling Startup and Operation" was run simultaneously with QCOS 1400-4, "Monthly Core Spray Pump Operability Test". Two RHR pumps and one CS pump were run at rated flow for 6 hours. Total flow was 13,600 gpm and resulted in 5.82 pool turnovers. The suction pressure on each pump was measured at the beginning of the test and at the end of the test. No decrease in suction pressure was observed. Based on the Unit 1 strainer inspection result in which two strainers were observed to be clean after the extended pump test and in which the sludge film thickness was noted to be approximately 1/32 of an inch after 14 months of operation, and the fact that an inspection of the Suppression Pool and ECCS Suction Strainers was performed during Q2R13 in June, 1995, prior to

adding water to the pool, it can be concluded that Unit 2 is in an as good or better condition after 2 months of operation.

During in-service testing (IST) quarterly ECCS pump surveillances, pump suction pressures are recorded and trended to provide indications of strainer blockage.

ACTION 3: SUPPRESSION POOL CLEANING

3) Schedule a suppression pool cleaning. The schedule for cleaning the pool should be consistent with the operability evaluation in requested action 1 above. In addition, a program for periodic cleaning of the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.

Response:

Given the Quad Cities past record of torus cleanings, Quad Cities will perform inspections and tests in accordance with BWROG letter 95083 Item 3, dated September 29, 1995, at the next refueling outage at each unit to determine if cleaning is necessary. At the time that the final Bulletin and Reg Guide on ECCS Suction Strainer performance during a Loss of Coolant Accident (LOCA) are issued, appropriate commitments, if necessary will be made regarding torus pool inspection, test(s) and cleaning.

ACTION 4: FME PROCEDURAL ADEQUACY

4) Review FME procedures and their implementation to determine whether adequate control of materials in the Drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and whether workers are sufficiently aware of their responsibilities regarding FME. Any identified weaknesses should be corrected. In addition, the effectiveness of the FME controls since the last time the suppression pool was cleaned and the ECCS strainers inspected, and the impact that any weaknesses noted may have on the operability of the ECCS should be assessed.

Response:

The Quad Cities procedure for FME Control is QCAP 307-24, "Foreign Material Exclusion." This procedure applies to controls for bringing materials into the Drywell and Torus in addition to the opening of any process system. This procedure assures that foreign material will not enter the Suppression Pool due to material left in systems that

communicate with the Suppression Pool. Training is conducted on FME area designation levels, and the controls required for the different levels. FME devices are now readily available for use, and all work packages address the required review for FME controls. Worker awareness is heightened for any activity that requires the use of FME practices, especially for any activity that has the potential for foreign material being introduced into or communicates with, the Reactor Pressure Vessel or Suppression Pool. Recent Problem Identification Forms (PIF's) indicate proper sensitivity to the FME program. FME barriers are used and when items are lost in systems, they are promptly reported, recovered if possible, and evaluated. Training was extensive during the implementation of the FME procedure and hands on, mock-up training was provided to most workers involved in performing work at Quad Cities Station.

ACTION 5: MONITORING OF PUMP SUCTION PRESSURE

5) Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.

Quad Cities currently samples suppression pool water on a weekly basis in accordance with QCCP 100-2, "Laboratory Analysis Schedule" and Attachment F, "Suppression Pool (Torus) Water Parameters." This sample is taken from the ECCS Keep Fill Pump. Weekly, the conductivity is analyzed, while on a monthly basis, pH, Chloride, Silica, Sulfate, and Total Organic Carbon (TOC) are analyzed. Quad Cities currently trends the ECCS pump suction pressures as part of the IST program.

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ATTACHMENT C
LaSALLE COUNTY STATION RESPONSE
NRC BULLETIN 95-02
November 14, 1995

This report provides the ComEd LaSalle County Station required 30-day response to NRC Bulletin 95-02, dated October 17, 1995. LaSalle County Station personnel have been in direct contact with Limerick Station since the September 11, 1995 event in efforts to resolve the potential BWR suction strainer blockage issues as they relate to LaSalle.

LaSalle's initial corrective actions addressed a) increasing site awareness to the Limerick event, b) reviewing the adequacy of our existing FME Program, and c) evaluating ECCS pump performance data with a focus on current ECCS operability.

LaSalle continues to monitor the information coming out of the Limerick incident for the purpose of assessing the adequacy of actions previously taken at LaSalle County Station. The LaSalle County Station responses to the five specific actions requested in the Bulletin follow.

ACTION 1: VERIFICATION OF PUMP OPERABILITY

Verify the operability of all pumps which draw a suction from the suppression pool when performing their safety functions (e.g., ECCS, containment spray, etc.), based on an evaluation of suppression pool and suction strainer cleanliness conditions. This evaluation should be based on the pool and strainer conditions during the last inspection or cleaning and an assessment of the potential for the introduction of debris or other materials that could clog the strainers since the pool was last cleaned.

ComEd LaSalle County Station (BWR-5, Mark II Containment) has removed all foreign material from the suppression pool area during the most recent refueling outage on each Unit. Operability has been evaluated and verified for all pumps which draw suction from the pressure suppression pool (PSP) while performing their safety functions for Units 1 and 2. In addition, LaSalle has made recent improvements in reducing chronic leakage of Main Steam Safety Relief Valves (SRVs) and the resulting extensive RHR run times in the PSP cooling mode of operation. The bases for the verification of operability for each Unit are presented below.

LaSalle Unit 1

All Unit 1 PSP suction strainers[1] were last inspected during the most recent refueling outage, L1R06 in April, 1994. At that time, an inspection for, and removal of, all PSP foreign material was performed. These activities were documented in NRC Information Notice 94-57. During various phases of L1R06, LaSalle made use of its Suppression Pool Cleanup (SF) system to improve the turbidity and ionic quality of the PSP water. This alignment processed multiple pool turnovers of PSP water through the Condensate Polisher (CP) resin beds.

LaSalle Unit 1 resumed operation after L1R06 with strainers which met or exceeded the cleanliness requirements criteria of BWROG 95083, Sec. 3b. All identified foreign material was removed from the PSP. In addition, a L1R06 PSP sludge sample was analyzed and found to be free of fibrous material.

Mark II containments are vulnerable to debris which could collect in the water contained in the submerged end of the PSP downcomers. The types of debris postulated to be located in a downcomer are either floating in the downcomer and entrapped inside it or have become water saturated, submerged, and have been removed during a PSP inspection.

A SCRAM, including an SRV lift, occurred in August, 1995 following which the A and B RHR pumps were aligned in the PSP cooling mode for approximately 35 and 20 hours, respectively. RHR pump discharge pressure and discharge flowrate data from early in the run was compared with the data from late in the run to determine if there was any degradation which might indicate any strainer blockage. Flow performance was acceptable over the entire run durations, and no flow degradation over time was identified.

All quarterly in-service testing (IST) ECCS pump surveillance data generated since L1R06 has been reviewed. Pump suction pressure data has been trended in an effort to determine if there has been any flow degradation which might indicate any strainer blockage. There was no degradation.

An enhanced foreign material exclusion (FME) program, developed in response to NRC Bulletin 93-02 and Bulletin 93-02, Supplement 1, has been in place since February, 1994. The PSP hatches have not been opened since L1R06 and the scope and duration of drywell work during forced outages since L1R06 were abbreviated. There has been little opportunity for the introduction of foreign material into the PSP since its last inspection and cleaning.

Based upon all of the above, it is concluded that all pumps which draw suction from the pressure suppression pool while performing their safety functions for LaSalle Unit 1 continue

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1 Per the UFSAR, LaSalle is configured to normally take five (5) ECCS pump, and corresponding water leg pump, suctions from the PSP (A/B/C RHR, HPCS, and LPCS). RCIC takes an alternate suction from the PSP. LaSalle typically aligns either A and/or B RHR for the PSP cooling mode of operation.

to be OPERABLE.

LaSalle Unit 2

All Unit 2 PSP suction strainers[1] were last inspected during the most recent refueling outage, L2R06 in March, 1995. At that time, an inspection for, and removal of, PSP foreign material was performed. During various phases of L2R06, LaSalle made use of its Suppression Pool Cleanup (SF) system to improve the turbidity and ionic quality of the PSP water. This alignment processed multiple pool turnovers of PSP water through the Condensate Polisher (CP) resin beds.

LaSalle Unit 2 resumed operation after L2R06 with strainers which met or exceeded the cleanliness requirements criteria of BWROG 95083, Sec. 3b. All identified foreign material was removed from the PSP.

Mark II containments are vulnerable to debris which could collect in the water contained in the submerged end of the PSP downcomers. The types of debris postulated to be located in a downcomer are either floating in the downcomer and entrapped inside it or have become water saturated, submerged, and have been removed during a PSP inspection.

All quarterly in-service testing (IST) ECCS pump surveillance data generated since L2R06 has been reviewed. Pump suction pressure data has been trended in an effort to determine if there has been any flow degradation which might indicate any strainer blockage. No degradation has been identified.

As in the case for LaSalle Unit 1, an enhanced FME program has been in place since February, 1994. The PSP hatches have not been opened since L2R06 and the scope and duration of drywell work during forced outages since L2R06 has been abbreviated. There has been little opportunity for the introduction of foreign material into the PSP since its last inspection and cleaning.

Based upon all of the above, it is concluded that all pumps which draw suction from the pressure suppression pool while performing their safety functions for LaSalle Unit 2 continue to be OPERABLE.

ACTION 2: CONFIRMATION OF OPERABILITY

The operability evaluation in requested action 1 above should be confirmed through appropriate test(s) and strainer inspection(s) within 120 days of the date of this bulletin.

LaSalle Units 1 & 2:

Within 120 days of the issuance of this Bulletin, LaSalle will perform a multiple ECCS pump run (two (2) ECCS pumps minimum) of sufficient duration to turn over the complete PSP inventory at least four times. Pump suction pressure shall be monitored, over time, with sufficient sensitivity to detect small changes in suction pressure (ie. degradation). The results of this activity will be transmitted to the NRC within 10 days following the pump run(s).

Direct inspection of the strainers, as requested by the Bulletin, and additional multiple ECCS pump testing related to strainer operability will be performed in connection with the next scheduled refueling outage for each Unit (L1R07 in January 1996 and L2R07 in September 1996) or an unscheduled outage to cold shutdown of either Unit.

ACTION 3: SUPPRESSION POOL CLEANING

Schedule a pool cleaning. The schedule for cleaning the pool should be consistent with the operability evaluation in requested action 1 above. In addition, a program for periodic cleaning of the suppression pool should be established, including procedures for the cleaning of the pool, criteria for determining the appropriate cleaning frequency, and criteria for evaluating the adequacy of the pool cleanliness.

LaSalle Units 1 & 2

LaSalle will clean, inspect, and desludge the PSP for each Unit during its next scheduled refueling outage, L1R07 and L2R07. Detailed procedures for each Unit will be developed to control these activities. After the PSPs have been cleaned and desludged, PSP water cleanliness will be verified as recommended in BWROG-95083, Section 3b, utilizing a multiple ECCS pump run of sufficient duration to turn over the complete PSP inventory a minimum of four times.

Following completion of L1R07 and L2R07, the cleanliness of the PSPs will be assured by either of the following methods:

1) A multiple ECCS pump run will be repeated starting at every second future refueling outage of each Unit (ie., L1R09 and L2R09). Two (2) strainers will be inspected, using remote cameras (or equivalent), to verify strainer cleanliness. The acceptance criteria of these inspections will be as recommended in BWROG-95083, Section 3b. Indications of fiber would be resolved in accordance with BWROG-95083, Section 3c. This remote inspection will not be performed during those outages where direct diver inspection of the PSP and strainers is performed (See Item 2) below).

2) A direct diver inspection/cleaning of the PSPs and strainers will be performed during every fourth future refueling outage of each Unit (ie., L1R11 and L2R11).

The frequencies of 1) and 2) above are technically acceptable based upon LaSalle's operating history, LaSalle's use of the SF System during refueling outages, LaSalle's absence of fibrous material in containment, the latest industry data regarding PSP sludge generation rates (PCI Letter, Hart to Green, dated 4/26/95) and the recent improvement in FME practices. In addition, these frequencies consider radiological source term, ALARA, plant materiel condition, and diver safety considerations.

ACTION 4: FME PROCEDURAL ADEQUACY

Review FME procedures and their implementation to determine whether adequate control of materials in the drywell, suppression pool, and systems that interface with the suppression pool exists. This review should determine if comprehensive FME controls have been established to prevent materials that could potentially impact ECCS operation from being introduced into the suppression pool, and whether workers are sufficiently aware of their responsibilities regarding FME. Any identified weaknesses should be corrected. In addition, the effectiveness of the FME controls since the last time the suppression pool was cleaned and the ECCS strainers inspected, and the impact that any weaknesses noted may have on the operability of the ECCS should be assessed.

LaSalle Units 1 & 2

Although the existing FME procedures are adequate as they relate to primary containment, LaSalle is continuously working to enhance our FME Program. Prior to L1R07, LaSalle will implement, and train first line supervision to, a new, standardized maintenance procedure. This procedure will implement actions to preclude foreign material events described in INPO's SOER 95-1. INPO has reviewed ComEd's procedure, and their comments have been incorporated (INPO Letter, Taylor to Clary, dated 8/6/95). The PSP, and its Drywell downcomers, are permanently designated as a zone requiring the highest level of FME controls.

During the most recent refueling outage on Unit 2 (L2R06), an Operator dropped a length of hose in a PSP downcomer. The Operator immediately contacted his supervision, and the hose was recovered prior to start-up. It was determined that the hose was not properly secured, and the Operator disconnected the hose in the improper order. This deficiency has been corrected through training and the expanded use of a manifold device for securing hoses that drain to a PSP downcomer. No other weaknesses have been identified.

Additional administrative controls; including a) Drywell closeout procedural steps, b) FME logs, and c) expanded availability of FME devices have been utilized to preclude the introduction of foreign material into the PSP. As illustrated above, current FME controls are effective, individual worker FME responsibilities are understood, and deviations quickly identified and corrected.

ACTION 5: ADDITIONAL MEASURES

Consider additional measures such as suppression pool water sampling and trending of pump suction pressure to detect clogging of ECCS suction strainers.

LaSalle Units 1 & 2

PSP water cleanliness will be verified as described in Action 3 above.

ECCS pump suction pressure is being trended in accordance with LaSalle's Trend Analysis Program (LAP-100-12).

LaSalle will perform a remote visual inspection of the internal water surfaces in the PSP downcomers. The purpose of this inspection is to determine whether there is any floating debris present. An initial sample of 10% of all downcomers will be inspected, and the need for additional inspection will be based upon the results from the initial sample. This scope will be performed during the first outage of drywell access, but no later than the next refueling outage for each Unit.

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