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Exelon SM
Nuclear

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

References:
(1) Letter from Keith R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for License Amendment for Technical Specifications Surveillance Requirement for Containment Spray Nozzles," dated April 19, 2002

(2) Letter from Keith R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Additional Information Supporting License Amendment Request on Technical Specifications Surveillance Requirements for Containment Spray Nozzles," dated September 9, 2002

In Reference 1, Exelon Generation Company, LLC (EGC) requested changes to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-72, NPF-77, NPF-37 and NPF-66, for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. The proposed changes requested a revision to TS 3.6.6, "Containment Spray and Cooling Systems," involving Surveillance Requirement (SR) 3.6.6.8. This SR verifies that each spray nozzle on the containment spray (CS) ring headers at the top of the containment dome is unobstructed. The current required Frequency for SR 3.6.6.8 is "10 years." The proposed changes would revise the required Frequency for this SR to "Following maintenance that could result in nozzle blockage OR Following fluid flow through the nozzles."

A001

During the NRC's review of Reference 1, additional information was requested and discussed on a telephone conference call between representatives of the NRC and EGC on July 30, 2002. This information was submitted in writing to the NRC in Reference 2. Subsequent to this submittal, the NRC requested additional follow-up information regarding the foreign material exclusion (FME) program and the CS system maintenance history. This information is presented in Attachments 1 and 2 for Braidwood Station and Byron Station, respectively.

In summary, Braidwood and Byron Stations have high confidence that the CS system is free of foreign material. This conclusion is based on the review of all maintenance work downstream of the containment isolation valves that breached the CS system since the last CS nozzle surveillance tests on each unit. Each work package had positive indication that the system was left clean and free of foreign material. A review of the overall FME program at Braidwood Station and Byron Station did not identify any documented FME problems on the CS system over the defined evaluation time period; however, it did identify that there have been program implementation problems. Corrective actions have been identified and have been/will be put in place to correct identified performance deficiencies.

It is also noted that the CS system is designed with two independent trains of containment spray ring headers. The applicable accident analyses assume only one train is available. In addition, further analysis has been performed to verify that if two spray nozzles on the active ring header were blocked, all applicable accident analyses acceptance criteria continue to be satisfied. Therefore, in the unlikely event that a piece of foreign material were to be present in the CS system and block two spray nozzles, the CS system would continue to perform its design basis function.

Finally, it is worthy to note that the CS nozzle surveillance test is intended to "verify each nozzle is unobstructed" as specified in TS SR 3.6.6.8, and is not intended to identify debris in the CS system lines. The standard CS nozzle air test, performed to meet the requirements of TS SR 3.6.6.8, would likely not identify the presence of foreign material in the CS system piping.

In conclusion, based on the above information, confidence is high that the CS system is free of foreign material and will be capable of performing its design basis function. Therefore it is acceptable to revise the frequency of SR 3.6.6.8 as described in Reference 1.

In Reference 1, we originally requested approval of the proposed change by November 19, 2002. Considering the attached additional information, we respectfully request that the NRC review and approve the proposed change by February 14, 2003. Approval by this date will still allow time to appropriately modify the Braidwood Station Unit 1 outage schedule. The Braidwood Station Unit 1 outage is currently scheduled to begin by April 15, 2003.

Should you have any questions related to this letter, please contact J. A. Bauer at (630) 657-2801.

Respectfully,

K. A. Ainger for

Keith R. Jury
Director – Licensing
Midwest Regional Operating Group

Attachments:

Affidavit
Attachment 1: Braidwood Station, Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles
Attachment 2: Byron Station, Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	**Docket Numbers**
BRAIDWOOD STATION, UNITS 1 AND 2	)	**50-456 AND 50-457**
BYRON STATION, UNITS 1 AND 2	)	**50-454 AND 50-455**

SUBJECT: **Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles**

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

Kenneth A. Ainger
Manager, Licensing

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 3rd day of January, 2003.

Notary Public

Attachment 1
Braidwood Station

Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

Question 1a

Please discuss maintenance and surveillance activities which resulted in a breach of the containment spray piping system between the CS007A/B valves and the spray nozzles since the last performance of the TS SR 3.6.6.8 test. Work activities near the ring headers, which could have introduced foreign material into the nozzles (such as painting), should also be included in your evaluation.

Response to Question 1a

Since the last performance of the containment spray (CS) nozzle surveillances (i.e., March 1991 for Unit 1; September 1991 for Unit 2), there have been several system breaches between the CS007A/B containment isolation valves (CIVs) and the spray nozzles for each unit at Braidwood Station as described below.

Every outage a local leak rate test (LLRT) of motor-operated CIVs, CS007A/B, and CIV check valves, CS008A/B, is performed. To support a LLRT of CS007A/B and CS008A/B, spectacle flange CS04MA/B is rotated with the blind side inward. This spectacle flange is located on the vertical riser of the CS header approximately 110 feet below the ring header and spray nozzles.

A surveillance to verify CS008 check valve operability is performed. The surveillance removes the check valve from the piping system and verifies that the valve internals were capable of performing as designed during the last operating cycle. Surveillance procedure BwVS 0.5-2.CS.3-2, "Containment Spray Check Valves Operability Test," was established with a 36-month frequency and used from March 1986 through October 1998 until superceded by surveillance procedure BwVSR 5.5.8.CS.3, "Containment Spray Check Valves Operability Test." The intent of the "new" procedure is very similar to the previous procedure. This "new" procedure was also performed on a 36-month frequency until recently when Braidwood Station identified these valves as "good performers" and extended the frequency to 54 months as allowed by the condition monitoring provision of the Inservice Testing Program. Beginning with the next scheduled Unit 1 refueling outage in Spring 2003, the CS008 check valves will be inspected every third outage.

After this initial inspection is complete, the selected valve is either refurbished, or replaced with a rebuilt check valve. The CS008 check valve removal and installation processes are governed by established maintenance procedures.

As required by procedure, after the repair or replacement of code parts and prior to system restoration, an "Open Flow Path Test" is conducted in accordance with surveillance procedure BwVSR 5.5.8.CS.6, "Open Flow Path Test for Containment Spray Header Inboard Containment Isolation Valve." The test performs a partial stroke test of the repaired/refurbished valve by introducing instrument air into the CS system through an installed drain valve upstream of the selected CS008 check valve, and then detecting escaping air downstream of the valve through an installed vent valve. This procedure was

established in October 1998 for initial use in refueling outage A1R07. The surveillance frequency of the "Open Flow Path Test" was established to coincide with the surveillance frequency of the selected train operability test discussed above. As such, the surveillance frequency of procedure BwVSR 5.5.8.CS.6 has also been recently changed to 54 months.

In summary, maintenance activities that breached the containment spray piping system between the CS007A/B CIVs and spray nozzles are as follows:

- Rotation of spectacle flange
- LLRT of CS007A/B and CS008A/B valves
- Inspection of CS008A/B valves
- Partial stroke test of CS008A/B valves

There have not been any work activities above the polar crane elevation that could have introduced foreign material, other than minor dust particles, into the spray nozzles on either unit at Braidwood Station. In addition, the Braidwood Station containment domes are not painted. Based on this information, there is no concern that foreign material could have been introduced into the spray nozzles as a result of work activities near the ring headers.

Question 1b

Please describe any foreign material exclusion program requirements implemented at the time of the activity. This should include QA cleanliness inspection results.

Response to Question 1b

Braidwood Station has reviewed work packages from 1991 to present for the following activities:

- Inspection of CS008A/B valves
- Repair of CS007A/B valves
- CS04MA/B spectacle flange installation/removal
- LLRT testing
- Partial stroke test of CS008A/B valves

Inspection of CS008A/B Valves

From 1991 to 1994, when removing the CS008 check valves from the process line, temporary covers were installed once the valves were removed for rebuild/inspection. Once the valve was ready to be installed, the temporary covers were removed and a "hold point" was inserted for the cognizant maintenance supervisor to perform a cleanliness inspection. During the removal and installation process, procedure BwMP 3300-008, "Control of Material and Equipment when Working in Open Process Lines or Confined Spaces Other Than RC

Systems," was used to log the tools utilized at the job location and record time in and out of the area.

From 1995 to 1997, the temporary covers continued to be utilized; however, the responsibility for performing the cleanliness inspection prior to installation shifted from a maintenance supervisor to a Quality Control (QC) inspector. The QC hold point was identified as a step in the work package and performed in accordance with procedure SMP-M-04 Exhibit A, "Foreign Material Exclusion Requirements."

From 1998 to 2000, in addition to the requirements described above, additional instructions elevated the attention to detail for maintaining internal system cleanliness. Inspections for internal system cleanliness were performed in accordance with procedure NSWP-A-03 Exhibit A, "Foreign Material Exclusion Requirements".

From 2000 to present, in addition to the requirements described above, foreign material exclusion (FME) requirements for the work area are also addressed during pre-job briefings. Currently, inspections for internal system cleanliness are performed in accordance with procedure MA-AA-716-008, "Foreign Material Exclusion Program," and documented in Attachment 1, "Work Package Forms."

Repair of CS007A/B Valves

There have been only two instances between 1991 to present where repairs to these valves breached the CS system. Prior to re-installation of the valves, QC hold points for internal cleanliness inspections of the piping were performed.

CS04MA/B Spectacle Flange Installation/Removal

The work packages associated with the rotation of the spectacle flange (i.e., CS04MA/B) from 1991 to present were reviewed. The rotation of the spectacle flange supports LLRTs and partial stroke testing of CS008A/B. In the work instructions, a note stating "maintain internal cleanliness throughout the entire job" was "checked" indicating a review was performed. The clearance between the two flanges which hold the spectacle flange is small (i.e., approximately 1/2 inch), and considering the flange is on the vertical riser with the flange faces installed horizontally, accidental intrusion of foreign material is extremely unlikely.

Inspection Results

The internal inspections performed on each of the above noted work packages were completed by either the first line supervisor or the QC inspector and did not reveal any foreign material in the system piping. The inspector's signature on the internal cleanliness step in the work package signifies that the system was clear of any foreign material.

Based on this review, Braidwood Station has high confidence that there are no FME issues associated with the CS system ring header.

Question 1c

1. *Describe what assurance you have that no foreign material could have entered each plant/unit's containment spray system during each of the occasions.*

2. *In particular, please explain why any plant-wide concerns with the implementation of the FME program would not have affected the confidence that the containment spray system is free from debris.*

Response to Question 1c(1)

As noted above, all maintenance work packages that breached the CS system downstream of the containment isolation valves since the last CS nozzle surveillance test in 1991, were reviewed. Each package had positive indication that the system was left clean and free of foreign material.

Based on the documentation reviewed, there is high confidence that introduction of foreign material into the CS System has been and will be precluded.

Response to Question 1c(2)

A review of FME events was performed from January 2000 to present. The review identified 32 FME events where a loss of FME integrity occurred. A loss of FME integrity is defined in Procedure MA-AA-716-008, "Foreign Material Exclusion Program," as the following:

- Unexpected foreign material is discovered inside a system, component or process upon initial opening or inspection.
- Material logged into an FME area that cannot be accounted for during tool and parts log(s) reconciliation.
- Material which is introduced into a system, component, or process that cannot be immediately retrieved (i.e., the ability to maintain direct visual contact or visual surveillance using remote equipment with the ability to monitor and retrieve foreign material).
- Internal FME devices fail, or external covers are damaged or missing while the area has been left unattended.
- Components used in a foreign material exclusion activity are found to be missing parts.
- Foreign material is found in an open-air system (fuel pool, open tanks, flooded reactor cavity, etc.).
- Parts or components are found missing during reassembly.

The 32 FME events were reviewed and categorized by causal factors (CFs). The data indicate that the primary CF for FME events is failure of plant equipment installed in the system or failure of a tool being used in the maintenance activity, which were not attributed in any part to FME work practices (i.e., 11 events; see table below). The next most common causal factor (i.e., 10 events) was associated with work practices. A review of these events revealed that two of the FME events were caused by current work practices. The remaining eight FME events were caused by past work practices, discovered during recent maintenance activities.

Loss of Foreign Material Integrity Events

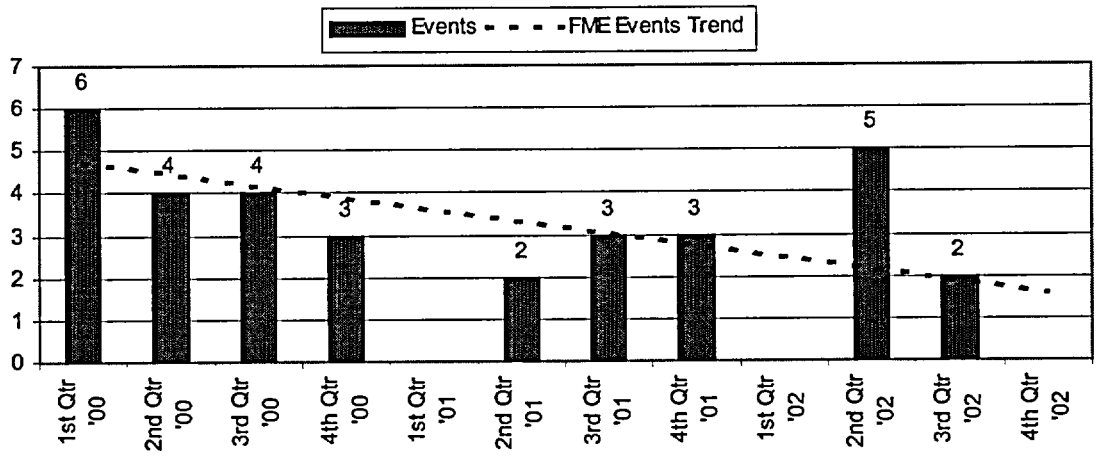
	2000	2001	2002	CF Total
Equipment Failure	4	5	2	11
Work Practices	5	1	4	10
Inaccurate Risk Perception	3	1		4
Plant Operations	2		1	3
Housekeeping	2			2
Package Planning	1			1
Procedure Adherence		1		1
Yearly Total	**17**	**8**	**7**	**32**

It should be noted that 13 of the 32 FME events were self-revealing; that is, the equipment or tool itself was the indication of foreign material. All of the remaining FME events were discovered and documented by a Condition Report by line personnel.

As depicted on the below graph, the overall FME event trend has been on an improving trend from 2000 through present.

Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

Loss of Foreign Material Integrity Events



The above information clearly shows that there have been FME issues at Braidwood Station in the past; however, none of the FME events involved the CS system. The FME issues/problems have been well documented and entered into the station's corrective action program. Based on the above discussion, there remains high confidence that the CS System is free of foreign material.

Question 2

Please explain the steps you will take to ensure that, after revising TS SR 3.6.6.8 as proposed, the FME program at each site will be maintained at the level necessary to provide assurance that the containment spray nozzles will remain free from blockage during future maintenance activities or testing. In your explanation, please discuss your evaluation of the current program as implemented, including any actions you plan to take to enhance or strengthen the program.

Response to Question 2

Due to past problems with FME issues, there is a heightened sensitivity to effectively implementing the FME program at Braidwood Station for all activities where FME is a potential concern. The current FME program provides complete, comprehensive guidance and requirements to prevent introduction of foreign materials into structures, systems, and components. The key to success of preventing foreign material intrusion is rigorous implementation of the program. All future maintenance on the CS system will be conducted in strict compliance with the FME requirements of Procedure MA-AA-716-008.

During 2000, an increase in FME events was reviewed during a common cause analysis and identified an adverse trend in FME events and issues in the Maintenance Department. A root cause investigation was subsequently initiated. This analysis identified two root causes

of the FME events. The first root cause was lack of knowledge of contractor personnel due to inadequate training. The second root cause was attributed to incorrect procedural interpretation by the First Line Supervisors, with a contributing factor that the Work Planners failed to aid the First Line Supervisors in identifying potential FME hazards. Appropriate corrective actions were put in place. Subsequently, an effectiveness review of these corrective actions was performed and completed on December 6, 2002. This review concluded that the corrective actions have been effective based on the improving trend in contractor and Mechanical Maintenance personnel FME events.

In addition, a number of FME program corrective actions will be implemented as a result of a recent Byron Station root cause analysis. Byron Station recently completed a root cause analysis specifically addressing the 2C steam generator foreign material induced tube leak. One of the root causes identified in this report is applicable to the overall FME program implementation. Three associated corrective actions and one corrective action to prevent recurrence were identified. These corrective actions have been reviewed for applicability to Braidwood Station and will be implemented as appropriate.

The applicable root cause states:

"The level of adherence to FME procedure requirements has not been enforced by Supervision or at the Peer level commensurate with the importance of the FME program."

The associated corrective actions are:

1. Communicate the roles and responsibilities as listed in Procedure MA-AA-716-008, "Foreign Material Exclusion Program." This communication should also include the reason for this procedure and consequences when this procedure is not followed. (Due date: January 30, 2003)

2. Implement periodic assessments to check compliance with the requirements of the FME procedure (i.e., MA-AA-716-008) and ensure the procedure is being used correctly. (Due date: June 20, 2003)

3. Fabricate, as necessary, portable FME carts to be used on job sites while performing work on open systems. This corrective action was reviewed and determined to not be applicable to Braidwood Station as Braidwood Station currently has three portable FME carts in use.

The associated corrective action to prevent recurrence is:

Prepare, document, and implement a plan to improve supervisory field presence to ensure that FME procedure requirements are being followed. This plan shall include types of activities to be observed, frequencies of observations and a determination of how the quality of critical feedback will be assessed and documented. This corrective action to prevent

recurrence was determined to be applicable to Braidwood Station and will be implemented. (Due date: January 30, 2003)

Conclusion

Braidwood Station has high confidence that the CS system is free of foreign material. This conclusion is based on the review of all maintenance work downstream of the containment isolation valves that breached the CS system since the last CS nozzle surveillance tests on each unit. Each work package had positive indication that the system was left clean and free of foreign material. A review of the overall FME program did not identify any documented FME problems on the CS system over the defined evaluation time period (i.e., January 2000 through present); however, it did identify that there have been program implementation problems. Corrective actions have been identified and have been/will be put in place to correct identified performance deficiencies.

It is also noted that the CS system is designed with two independent trains of containment spray ring headers. The applicable accident analyses assume only one train is available. In addition, further analysis has been performed to verify that if two spray nozzles on the active ring header were blocked, all applicable accident analyses acceptance criteria continue to be satisfied. Therefore, in the unlikely event that a piece of foreign material were to be present in the CS system and block two spray nozzles, the CS system would continue to perform its design basis function.

Finally, it is worthy to note that the CS nozzle surveillance test is intended to "verify each nozzle is unobstructed" as specified in Technical Specification (TS) Surveillance Requirement (SR) 3.6.6.8, and is not intended to identify debris in the containment spray lines. The standard CS nozzle air test, performed to meet the requirements of TS SR 3.6.6.8, would likely not identify the presence of foreign material in the CS system piping.

In conclusion, based on the above information, confidence is high that the CS system is free of foreign material and will be capable of performing its design basis function. Therefore it is acceptable to revise the frequency of SR 3.6.6.8 as described in a letter from Keith R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for License Amendment for Technical Specifications Surveillance Requirement for Containment Spray Nozzles," dated April 19, 2002.

Attachment 2
Byron Station

Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

Question 1a

Please discuss maintenance and surveillance activities which resulted in a breach of the containment spray piping system between the CS007A/B valves and the spray nozzles since the last performance of the TS SR 3.6.6.8 test. Work activities near the ring headers, which could have introduced foreign material into the nozzles (such as painting), should also be included in your evaluation.

Response to Question 1a

Since the last performance of the containment spray (CS) nozzle surveillances (i.e., October 1991 for Unit 1; March 1992 for Unit 2), there have been several system breaches between the CS007A/B containment isolation valves (CIVs) and the spray nozzles for each unit at Byron Station as described below.

Every outage a local leak rate test (LLRT) of motor-operated CIVs, CS007A/B, and CIV check valves, CS008A/B, is performed. To support a LLRT of CS007A/B and CS008A/B, spectacle flange CS04MA/B is replaced with a blind flange. This spectacle flange is located on the vertical riser of the CS header approximately 110 feet below the ring header and spray nozzles.

Following the LLRT, the CS008 check valve was removed from the system to perform a check valve inspection/test. The test verifies that the valve internals were capable of performing as designed during the last operating cycle. The test procedure is included in NSP MA-AA-733-1001, "Guidance for Check Valve Inspection," and is completed at the Inservice Testing (IST) Program test interval. The IST Program test interval had been 36 months. The frequency was changed in October 2000 when these check valves were put into condition based monitoring and is now 54 months.

After this initial inspection is complete, the selected valve is either refurbished, or replaced with a rebuilt check valve. The CS008 removal and installation processes are governed by established maintenance procedures.

As of June 2000, Byron Station's IST Program no longer requires a partial stroke of check valves. Prior to June 2000, Byron Station completed a partial stroke of the CS008 valve as required by the ASME code. That test was a partial stroke test of the repaired/refurbished valve by introducing instrument air into the CS system through an installed drain valve upstream of the selected CS008, and then detecting escaping air downstream of the valve through an installed vent.

In summary, maintenance activities that breached the containment spray piping system between the CS007A/B CIVs and spray nozzles are as follows:

- Replacement of spectacle flange with blind flange
- LLRT of CS007A/B and CS008A/B valves

- Inspection of CS008A/B valves
- Partial stroke test of CS008A/B valves

There have not been any work activities above the polar crane elevation that could have introduced foreign material, other than minor dust particles, into the spray nozzles on either unit at Byron Station. In addition, the Byron Station containment domes were painted prior to the nozzles being installed. No painting has been completed near the dome or polar crane area since original construction. Based on this information, there is no concern that foreign material could have been introduced into the spray nozzles as a result of work activities near the ring headers.

Question 1b

Please describe any foreign material exclusion program requirements implemented at the time of the activity. This should include QA cleanliness inspection results.

Response to Question 1b

Byron has reviewed work packages from 1991 to present for the following activities:

- Inspection of CS008A/B valves
- Repair of CS007A/B valves
- CS04MA/B spectacle flange installation/removal
- LLRT testing
- Partial stroke test of CS008A/B valves

Inspection of CS008A/B Valves

From 1991 to 2000, when removing the CS008 check valves from the process line, temporary covers were installed once the valves were removed for rebuild/inspection. Once the valve was ready to be installed, the temporary covers were removed and a "hold point" was inserted for the Quality Control (QC) Inspector to perform a cleanliness inspection.

From 2000 to present, in addition to the requirements described above, foreign material exclusion (FME) requirements for the work area are also addressed during pre-job briefings. Currently, inspections for internal system cleanliness are performed in accordance with procedure MA-AA-716-008, "Foreign Material Exclusion Program," and documented in Attachment 1, "Work Package Forms." Additionally, a task has been added to the work orders for QC to perform a cleanliness inspection.

Repair of CS007A/B Valves

There have been only two instances between 1991 to present where repairs have been made to these valves; neither included a breach of the CS system. Both repairs entailed

repacking of the valves. Prior to returning the valves to service, QC hold points were implemented and cleanliness inspections performed.

CS04MA/B Spectacle Flange Installation/Removal

The work packages associated with replacing the spectacle flange (i.e., CS04MA/B) from 1991 to present were reviewed. The replacement of the spectacle flange supports LLRTs and partial stroke testing of CS008A/B. In the work instructions, a note stating "maintain internal cleanliness throughout the entire job" was "checked" indicating a review was performed. The clearance between the two flanges which hold the spectacle flange is small (i.e., approximately 1/2 inch), and considering the flange is on the vertical riser with the flange faces installed horizontally, accidental intrusion of foreign material is extremely unlikely.

Inspection Results

The internal inspections performed on each of the above noted work packages were completed by a QC inspector and did not reveal any foreign material in the system piping. The inspector's signature on the internal cleanliness step in the work package signifies that the system was clear of any foreign material.

Based on this review, Byron Station has high confidence that there are no FME issues associated with the CS system ring header.

Question 1c

1. *Describe what assurance you have that no foreign material could have entered each plant/unit's containment spray system during each of the occasions.*

2. *In particular, please explain why any plant-wide concerns with the implementation of the FME program would not have affected the confidence that the containment spray system is free from debris.*

Response to Question 1c(1)

As noted above, all maintenance work packages that breached the CS system downstream of the containment isolation valves since the last CS nozzle surveillance test in 1991 (for Unit 1) and 1992 (for Unit 2), were reviewed. Each package had positive indication that the system was left clean and free of foreign material.

Based on the documentation reviewed, there is high confidence that introduction of foreign material into the CS System has been and will be precluded.

Attachment 2
Byron Station

Response to Request for Additional Information Supporting a License Amendment Request Revising the Technical Specifications Surveillance Requirements for Containment Spray Nozzles

Response to Question 1c(2)

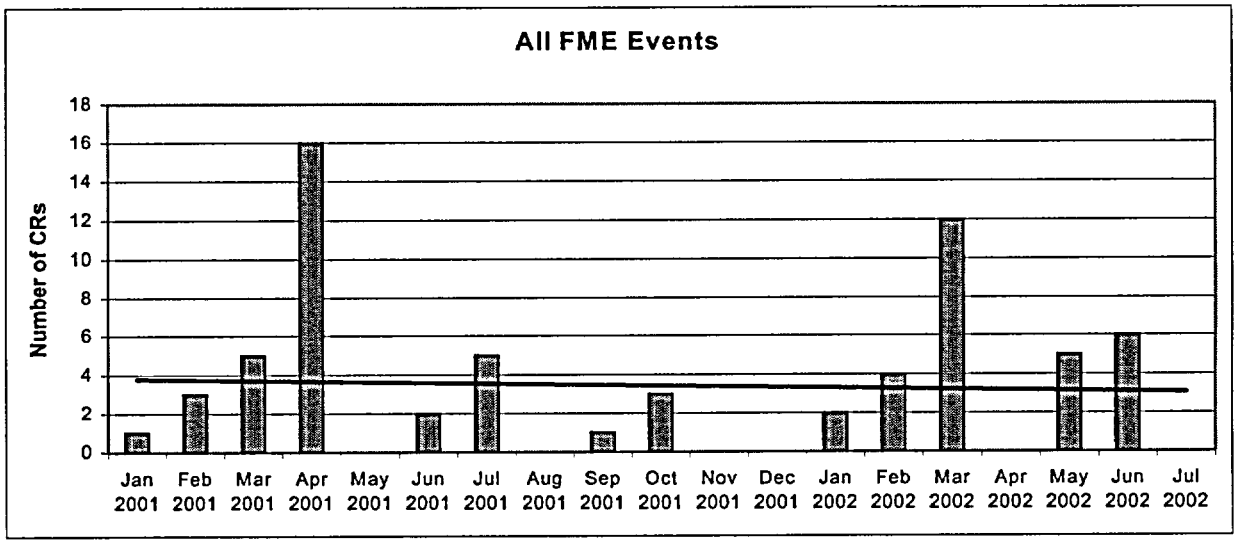
A Common Cause Analysis (CCA) was performed at Byron Station in August 2002 to evaluate FME issues and concerns. This analysis identified 65 Condition Reports (CRs) that were written addressing FME events between January 2001 and July 2002. In summary, the CCA identified that a potential common cause of the FME issues was due to ineffective management/supervisory oversight/ownership of the FME program.

The 65 FME "events," fell into the following categories:

- 33 events entailed administrative control issues and poor FME control practices;
- 32 events involved actual foreign material intrusion (FMI) of which 22 events were due to an unknown cause.

None of the 65 FME events involved the CS system.

As depicted on the below graph, the overall FME event trend has been on a slightly improving trend over the duration of the analysis (i.e., January 2001 through July 2002).



Although this review of FME-related CRs initiated during this time period did not identify any foreign material issues in the CS system, two previous incidents involving foreign material in the CS system should be noted. In January 1998 a turbine condenser tube cleaning brush was found lodged in the valve disc of the 1A CS eductor spray additive motor operated valve (i.e., 1CS019A). In June 1999, a second turbine condenser cleaning brush was found in the 1A CS eductor test connection isolation valve (i.e., 1CS026A). Both of these valves are upstream of the CS eductor. The brushes presumably came from a hose used during the spray additive eductor flow verification surveillance test conducted in June 1997. This hose had previously been used for turbine condenser cleaning activities. Extensive CS system inspections were completed due to these FME events. It is reasonable to conclude there are

no other brushes or other foreign material in the CS system. A step was subsequently added to the surveillance test procedure to verify that hoses used for the surveillance test are clear of internal debris.

Question 2

Please explain the steps you will take to ensure that, after revising TS SR 3.6.6.8 as proposed, the FME program at each site will be maintained at the level necessary to provide assurance that the containment spray nozzles will remain free from blockage during future maintenance activities or testing. In your explanation, please discuss your evaluation of the current program as implemented, including any actions you plan to take to enhance or strengthen the program.

Response to Question 2

Due to past problems with FME issues, there is a heightened sensitivity to effectively implementing the FME program at Byron Station for all activities where FME is a potential concern. The current FME program provides complete, comprehensive guidance and requirements to prevent introduction of foreign materials into structures, systems, and components. The key to success of preventing foreign material intrusion is rigorous implementation of the program. All future maintenance on the CS system will be conducted in strict compliance with the FME requirements of Procedure MA-AA-716-008.

In addition, a number of FME program corrective actions will be implemented. Byron Station recently completed a root cause analysis specifically addressing the 2C steam generator foreign material induced tube leak. One of the root causes identified in this report is applicable to the overall FME program implementation. Three associated corrective actions and one corrective action to prevent recurrence were identified. These corrective actions will be implemented as noted below.

The applicable root cause states:

"The level of adherence to FME procedure requirements has not been enforced by Supervision or at the Peer level commensurate with the importance of the FME program."

The associated corrective actions are:

1. Communicate the roles and responsibilities as listed in Procedure MA-AA-716-008, "Foreign Material Exclusion Program." This communication should also include the reason for this procedure and consequences when this procedure is not followed. (Due date: January 30, 2003)

2. Implement periodic assessments to check compliance with the requirements of the FME procedure (i.e., MA-AA-716-008) and ensure the procedure is being used correctly. (Due date: June 20, 2003)

3. Fabricate, as necessary, portable FME carts to be used on job sites while performing work on open systems. (Due date: July 25, 2003)

The associated corrective action to prevent recurrence is:

Prepare, document, and implement a plan to improve supervisory field presence to ensure that FME procedure requirements are being followed. This plan shall include types of activities to be observed, frequencies of observations and a determination of how the quality of critical feedback will be assessed and documented. (Due date: January 30, 2003)

Conclusion

Byron Station has high confidence that the CS system is free of foreign material. This conclusion is based on the review of all maintenance work downstream of the containment isolation valves that breached the CS system since the last CS nozzle surveillance tests on each unit. Each work package had positive indication that the system was left clean and free of foreign material. A review of the overall FME program did not identify any documented FME problems on the CS system over the defined evaluation time period (i.e., January 2001 through July 2002); however, it did identify that there have been program implementation problems. Corrective actions have been identified and will be put in place to correct identified performance deficiencies.

It is also noted that the CS system is designed with two independent trains of containment spray ring headers. The applicable accident analyses assume only one train is available. In addition, further analysis has been performed to verify that if two spray nozzles on the active ring header were blocked, all applicable accident analyses acceptance criteria continue to be satisfied. Therefore, in the unlikely event that a piece of foreign material were to be present in the CS system and block two spray nozzles, the CS system would continue to perform its design basis function.

Finally, its worthy to note that the CS nozzle surveillance test is intended to "verify each nozzle is unobstructed" as specified in Technical Specification (TS) Surveillance Requirement (SR) 3.6.6.8, and is not intended to identify debris in the containment spray lines. The standard CS nozzle air test, performed to meet the requirements of TS SR 3.6.6.8, would likely not identify the presence of foreign material in the CS system piping.

In conclusion, based on the above information, confidence is high that the CS system is free of foreign material and will be capable of performing its design basis function. Therefore it is acceptable to revise the frequency of SR 3.6.6.8 as described in a letter from Keith R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for License Amendment for Technical Specifications Surveillance Requirement for Containment Spray Nozzles," dated April 19, 2002.