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May 17, 2002

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Three Mile Island, Unit 1 (TMI Unit 1)
Facility Operating License No. DPR-50
NRC Docket No. 50-289

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: Exelon/AmerGen Sixty-Day Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

References:
(1) Letter from J. A. Benjamin (Exelon Generation Company, LLC) to NRC, "Exelon/AmerGen Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated April 1, 2002

(2) Letter from R. P. Lopriore (Exelon Generation Company, LLC) to NRC, "Byron Station Unit 1 Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity," dated April 26, 2002

On March 18, 2002, the NRC issued NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." This bulletin required that the following information be submitted to the NRC within 15 days:

- plant specific information regarding a summary of the reactor pressure vessel (RPV) head inspection and maintenance programs;
- an evaluation for the ability of the inspection and maintenance programs to identify degradation of the RPV head;

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- a description of any conditions identified that could have led to degradation and the corrective actions taken;
- the schedule, plans, and basis for future inspection of the RPV head and penetration nozzles; and
- a conclusion regarding whether there is reasonable assurance the applicable regulatory requirements are currently being met.

This information was provided to the NRC in Reference 1.

The bulletin also required that within 30 days after plant restart following the next inspection of the RPV head, information regarding the inspection scope, results, and corrective actions taken, must be submitted to the NRC. Byron Station provided this information for Unit 1 to the NRC in Reference 2. Byron Unit 2, Braidwood Station, Units 1 and 2, and Three Mile Island, Unit 1 will provide this information in the future consistent with the bulletin's requirements.

In addition, within 60 days of the date of the bulletin, information must be submitted to the NRC regarding the basis for concluding that the boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and the bulletin.

Pursuant to 10 CFR 50.54, "Conditions of licenses," paragraph (f), Attachment 1 to this letter provides the AmerGen 60-day bulletin response for Three Mile Island, Unit 1, and Attachments 2 and 3 provide the Exelon Generation Company, LLC 60-day bulletin response for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. This response is due to the NRC by May 17, 2002.

If you have any questions or desire additional information regarding this letter, please contact me at (630) 657-2809.

Respectfully,

Keith R. Jury for

Jeffrey A. Benjamin
Vice President
Licensing and Regulatory Affairs

Attachments: Attachment 1, Sixty-Day Response to NRC Bulletin 2002-01, Three Mile Island, Unit 1
Attachment 2, Sixty-Day Response to NRC Bulletin 2002-01, Braidwood Station, Units 1 and 2
Attachment 3, Sixty-Day Response to NRC Bulletin 2002-01, Byron Station, Units 1 and 2

cc: Regional Administrator – NRC Region I
Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Braidwood Station
NRC Senior Resident Inspector – Byron Station
NRC Senior Resident Inspector – TMI

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	**Docket Numbers**
BRAIDWOOD STATION - UNITS 1 AND 2	)	**STN 50-456 AND STN 50-457**
BYRON STATION - UNITS 1 AND 2	)	**STN 50-454 AND STN 50-455**
AMERGEN ENERGY COMPANY, LLC	)	**Docket Number**
THREE MILE ISLAND, UNIT 1	)	**50-289**

SUBJECT: **Exelon/AmerGen Sixty-Day Response to NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"**

AFFIDAVIT

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

Keith R. Jury

Keith R. Jury
Director – Licensing
Midwest Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and

for the State above named, this 17th day of

May, 2002.

Anese L. Grigsby

Notary Public

OFFICIAL SEAL
ANESE L. GRIGSBY
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES 3-13-2005

ATTACHMENT 1

Sixty-Day Response to NRC Bulletin 2002-01 "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

Three Mile Island, Unit 1

AmerGen Energy Company, LLC (AmerGen)

Attachment 1

Sixty-Day Response to NRC Bulletin 2002-01

Three Mile Island (TMI), Unit 1

On March 18, 2002, the NRC issued NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." The below information is required within 60 days of the date of the bulletin.

"*The basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your program.*"

TMI Unit 1 has reasonable assurance that the boric acid inspection program complies with the requirements discussed in Generic Letter (GL) 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and NRC Bulletin 2002-01 as discussed in our response below.

This response was developed using the guidance provided by the Nuclear Energy Institute (NEI) for the Materials Reliability Program (MRP). These guidelines were transmitted to licensees in a letter from Alex Marion (NEI) to NEI Administrative Points of Contact, "Guidance for 60-day Response to NRC Bulletin 2002-01," dated April 16, 2002. The response addresses the following topics:

1. Program Definition and Responsibility
2. Inspection Scope and Frequency
3. Obstructions to Visual Inspections
4. Training
5. Response to Leakage
6. Review of Program Effectiveness

1. *Program Definition and Responsibility*

   TMI Unit 1 has incorporated the requirements discussed in GL 88-05 into several surveillance procedures. These procedures, noted below, provide inspection requirements and the direction for evaluation and/or repair when boric acid leaks are identified.

   - Procedure 1303-1.1, "Reactor Coolant System Leak Rate"
   - Procedure 1303-8.1, "Reactor Coolant System"
   - Procedure 1300-6, "VT-2 Leakage Exam"
   - TMI Unit 1 In-Service Inspection (ISI) Program

   The responsibility for GL 88-05 is assigned to the TMI Unit 1 Engineering Programs Department.

   As part of the characterization and disposition of boric acid leaks identified during American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice

Inspection of Nuclear power Plant Components," required VT examinations, the examiner is required to complete proceduralized checklists that provide a structured approach to evaluating the leak. This process requires that the boric acid leak will be cleaned and an evaluation performed for the extent of any degradation that may have occurred. Follow-up work requests are generated for repair as necessary. The majority of the leaks found are minor packing leaks or valve body to bonnet leaks. All of the leaks are cleaned and evaluated.

2. *Inspection Scope and Frequency*

The TMI Unit 1 Operating Department monitors on-line leakage as part of the Technical Specification requirements for identified and unidentified leakage. When on-line containment entries are performed, personnel will document evidence of boric acid leakage by initiating work requests. Operating procedures require an inspection to identify any reactor coolant system (RCS) leakage following plant shutdown.

In addition, leakage evaluations may also be initiated in response to:

- an increase in Reactor Building Radiation Monitor (RM-A2) activity,
- increases in Reactor Building Sump level from trend analysis, and
- a decrease in the performance of the Reactor Building air coolers.

Scheduled inspections are completed every cycle prior to an outage/shutdown and a second VT-2 inspection/ walkdown is completed every cycle prior to startup as required by ASME Section XI. This VT-2 inspection includes Class 1 components. The ISI program performs inspections on the RCS every 10 years in accordance with ASME Section XI. Additional inspections would be performed based upon Technical Specification monitored limits. All ASME Class 2 and Class 3 systems, which include all borated systems, are examined every Inservice Inspection period. VT-2 qualified individuals perform these examinations.

In accordance with the ASME Section XI Code, examinations may be performed with the insulation in place. However, systems that are borated for the purpose of controlling reactivity are required to have the insulation removed from all bolted connections, including manways, to determine their condition. The ASME Class 1 bolted connections are completed each refueling (i.e., 24 months) and the ASME Class 2 and 3 bolted connections are examined every Inservice Inspection period.

The TMI Unit 1 VT-2 procedure considers any evidence of boric acid a recordable indication, and must be evaluated and dispositioned. This procedure requires that cleaning, as a minimum, be performed.

The Operating Experience (OPEX) process screens, evaluates, and acts on OPEX documents and information from internal sources (i.e., other Exelon facilities) and external sources (e.g., INPO, NRC, vendors). Subject Matter Experts (SMEs) are assigned, as appropriate, to perform a detailed review of these OPEX documents using the OPEX process. As part of the review process, the SME formulates actions necessary to appropriately address affected items such as procedure revisions, program scope changes, training, and preventative maintenance frequencies. Operability issues,

identified during the OPEX review process, are documented in the Corrective Action Program and evaluated through the Operability Determination process.

TMI Unit 1 will continue to monitor the MRP recommendations and factor them into future outage planning as appropriate.

3. *Obstructions to Visual Inspections*

Visual inspections are coordinated in conjunction with the ASME Section XI requirements. The ASME Code has recognized some of the underlying issues associated with boric acid corrosion and has incorporated these into the code, including the Borated Bolted Connection Program. Currently, the system examinations specified by the ASME Code require that the RCS be at normal operating pressure and temperature. TMI Unit 1 Relief Request RR-00-08 has been submitted to the NRC with respect to the Bolted Connection program to allow for these examinations to be performed with insulation removed and the system depressurized, and with the insulation in place and the system pressurized.

As stated above, bolted connections that are insulated will have their insulation removed on a periodic basis for examination. This ensures that leaks are detected early and dispositioned. This includes the reactor vessel flange, core flood valves, steam generator manways and pressurizer manway.

Inspection techniques are specifically identified for the areas with obstructed visibility, such as the use of remote video for inspection of the reactor coolant pump main flange. The reactor vessel head is another example where the bare metal inspection requires the use of boroscopes, robotic cameras, etc. This reactor vessel head inspection was most recently completed during the last refueling outage in October 2001.

4. *Training*

Personnel performing visual examinations, whether for GL 88-05 or ASME Section XI Code examinations, are required to be VT-2 certified. The VT-2 certification requires specific training and experience requirements, and is modeled after Society of Non-Destructive Testing SNT-TC-1A requirements. TMI Unit 1 has submitted Relief Request RR-00-07 that modifies this training to include exceptions as approved in Code Case N-546, with the conditions of NRC Draft Guide (DG)-1091. To maintain this certification, the examiner is required to maintain proficiency and attend formal training every three years.

The formal training required to maintain VT-2 certification is structured towards the requirements of the ASME code. The lessons learned from industry events are incorporated into the pre-job briefs that are given prior to the various walkdowns being performed. This ensures a more timely analysis of the industry events as they apply to the station and to the specific area to be examined. As an example, a specific pre-job brief was conducted for the reactor pressure vessel bare metal head inspection performed in October 2001, and the subsequent restart VT-2 inspection.

5. *Response to Leakage*

The acceptance criteria as specified by various surveillance procedures, requires that any relevant/recordable indication be evaluated against the standards of IWB-3522. Additionally in accordance with Generic Letter 91-18, "Information to Licensees Regarding NRC Inspection Manual Section of Resolution of Degraded and Nonconforming Conditions," through- wall leakage is not allowed in Class 1 and Class 2 systems. Other leakage, both borated and non-borated, identified during the periodic walkdown is repaired as soon as possible. The normal course of action is to write a work request and repair the leakage as soon as possible.

TMI Unit 1 Technical Specification 3.1.6, "Leakage," requires that unidentified leakage be less than one gallon per minute. In addition, TMI Unit 1 actively monitors both identified leakage and unidentified leakage on a daily basis. As part of this monitoring, containment atmosphere is continuously monitored for increases in radiation, and reactor building sumps are trended for increased leakage. Any increase in leakage is aggressively pursued for identification, up to and including making containment entries to identify the sources. Every effort is taken to identify leakage and address that leakage through evaluation or, if possible, scheduled repairs.

The VT-2 Examination Data Sheet contains specific direction for evaluating any evidence of leakage. The examiner (with additional support as needed) is required to clean the affected area and notify Engineering to evaluate the leak for degradation and possible repair actions. If the leak were of a magnitude that other areas were affected, the appropriate additional cleaning would be conducted.

6. *Review of Program Effectiveness*

GL 88-05 inspections are considered part of the Inservice Inspection (ISI) Pressure Test Program within the ASME ISI program, including the Augmented ISI items. TMI Unit 1 periodically assesses the conduct of the overall ISI program through Focused Area Self Assessments (FASA). We will ensure that the next ISI FASA includes a specific review of elements within the boric acid inspection program. Program enhancements will be implemented as appropriate. The Nuclear Oversight Department also conducts periodic assessments of ISI program activities.

A direct result of the program effectiveness is the reduction in size of the leaks that are periodically identified. These leaks are usually very small in size, affecting only the component itself.

When boric acid leaks are identified during the periodic examinations, the TMI Unit 1 standard operating practice as defined by the VT-2 Examination, requires that at a minimum an engineering evaluation be written to address the boric acid leak. Repairs are implemented during the outage if found at that time, or placed in the normal 13-week schedule. Cleaning and repairs are expedited depending on the nature of the leak and the function of the applicable component.

TMI Unit 1 engineers communicate with other utilities and within the Exelon fleet when leakage issues are identified. This communication ensures a uniform response to these issues.

ATTACHMENT 2

Sixty-Day Response to NRC Bulletin 2002-01 "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

Braidwood Station, Units 1 and 2

Exelon Generation Company, LLC

Attachment 2

Sixty-Day Response to NRC Bulletin 2002-01

Braidwood Station Units 1 and 2

On March 18, 2002, the NRC issued NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." The below information is required within 60 days of the date of the bulletin.

"*The basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your program.*"

Braidwood Station has reasonable assurance that the boric acid inspection program complies with the requirements discussed in Generic Letter (GL) 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and NRC Bulletin 2002-01 as discussed in our response below.

This response was developed using the guidance provided by the Nuclear Energy Institute (NEI) for the Materials Reliability Program (MRP). These guidelines were transmitted to licensees in a letter from Alex Marion (NEI) to NEI Administrative Points of Contact, "Guidance for 60-day Response to NRC Bulletin 2002-01," dated April 16, 2002. The response addresses the following topics:

1. Program Definition and Responsibility
2. Inspection Scope and Frequency
3. Obstructions to Visual Inspections
4. Training
5. Response to Leakage
6. Review of Program Effectiveness

1. *Program Definition and Responsibility*

Braidwood Station has incorporated the requirements discussed in GL 88-05 into several station and corporate procedures. These procedures provide inspection requirements and the direction for evaluation and/or repair when boric acid leaks are identified.

The following procedures contain references to GL 88-05:

- BwVS 290-1, "Visual Examination (Leakage Check) of Potentially Radioactive Components Outside Containment"
- BwVSR 5.5.2.a, "Leak Test Requirements for Potentially Contaminated Components Outside Containment"
- BwVS TRM 3.4.f.2-3.1, "Scheduled ASME Section XI Period and Interval Visual Examination (VT-2) of Class 1 Components at Nominal Operating Pressures"
- BwVS TRM 3.4.f.2-3.4, "Scheduled ASME Section XI Period and Interval Visual Examination (VT-2) of Class 2 & 3 Components at Nominal Operating Pressures"

- 1/2 BwVS TRM 3.4.f.2-10.1, "Examination of Borated Bolted Connections in the Unit 1/2 Containment"
- BwVS TRM 3.4.f.2-10.2, "Examination of Insulated Borated Bolted Connections Located Outside Containment"
- BwVP 200-11, "ASME Section XI Bolted Connection Evaluation"

The responsibility for the GL 88-05 Program is assigned to the Braidwood Station Engineering Department.

As part of the characterization and dispositioning of boric acid leaks identified during the American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice Inspection of Nuclear power Plant Components," VT examinations, the examiner is required to complete proceduralized checklists that provide a structured approach to evaluating the leak. This process requires that the boric acid leak be cleaned and an evaluation performed addressing the extent of degradation that may have occurred. Follow-up work requests for repair are generated as necessary. The leaks are placed into two categories, active and non-active. The majority of the leaks found are minor packing leaks or body to bonnet leaks. All of the non-active leaks are cleaned and evaluated for degradation of the base materials. Active leaks are prioritized and repaired as necessary.

2. *Inspection Scope and Frequency*

Operating Department monitors on-line leakage as part of the Technical Specification requirements for identified and unidentified leakage. When on-line containment entries are performed, personnel report identification of boric acid leakage by writing work requests. The GL 88-05 Program requires that a pre-outage examination be completed in containment. Additionally, pressure test VT-2 examinations are conducted in containment during outages and a post outage ASME VT-2 examination is completed. These VT-2 inspections include all Class 1 components.

Walkdowns are completed for GL 88-05 every cycle during the outage/shutdown in Mode 3 and a second walkdown is completed in Mode 3 every cycle prior to startup as required by ASME Section XI. In addition, Engineering personnel walkdown the accessible portions of their systems once per quarter and the non-accessible portions of their systems during an outage looking for material condition issues, which includes boric acid leaks.

All ASME Class 2 and 3 systems, which include all borated systems, are examined every Inservice Inspection period. VT-2 qualified individuals perform all these examinations. All Class 1 systems are examined each refueling outage.

In accordance with the ASME Section XI Code, examinations may be performed with the insulation in place. However, systems that are borated for the purpose of controlling reactivity are required to have the insulation removed from all bolted connections, including manways, to determine their condition. The ASME Class 1 bolted connections are completed each refueling (i.e., 18 months) and the ASME Class 2 and 3 bolted connections are examined every Inservice Inspection period.

In accordance with our VT-2 procedure, any evidence of boric acid is considered a "Recordable Indication," and must be evaluated and dispositioned. This requires the generation of a work request for cleaning as a minimum.

The Operating Experience (OPEX) process screens, evaluates, and acts on OPEX documents and information from internal sources (i.e., other Exelon facilities) and external sources (e.g., INPO, NRC, vendors). Subject Matter Experts (SMEs) are assigned, as appropriate, to perform a detailed review of these OPEX documents using the OPEX process. As part of the review process, the SME formulates actions necessary to appropriately address affected items such as procedure revisions, program scope changes, training, and preventative maintenance frequencies. Operability issues, identified during the OPEX review process, are documented in the Corrective Action Program and evaluated through the Operability Determination process.

3. *Obstructions to Visual Inspections*

As previously stated above, bolted connections that are insulated will have their insulation removed on a periodic basis for examination. This ensures that leaks are detected early and dispositioned. This includes the reactor vessel flange, steam generator manways and pressurizer manway.

Additionally, a qualified visual examination of the reactor vessel head beneath the insulation (i.e., bare metal head examination) has been completed for Braidwood Station Unit 2 during the recent refueling outage in the Spring of 2002, (i.e., A2R09). The details of this examination were discussed with NRC in a May 2, 2002, teleconference. Additional details will be provided in a written response as stipulated by Required Action 2 of NRC Bulletin 2002-01. Braidwood Station is evaluating the extent of the visual examination of the Unit 1 reactor vessel head scheduled for the Spring of 2003 (A1R10). Braidwood Station will also monitor the NEI MRP recommendations and factor them into future outage planning as appropriate.

Inspection techniques are specifically identified for the areas with obstructed visibility, such as the Reactor Vessel Head. Access under the insulation of the Reactor Vessel Head is a difficult and dose intensive evolution and the use of remote examination equipment is required for performance of this inspection. For the recent Unit 2 examination discussed above, a special procedure and specific work orders were initiated to perform this inspection.

4. *Training*

All persons performing visual examinations, whether for GL 88-05 or ASME Section XI Code exams, are required to be VT-2 certified. This certification requires specific training and experience requirements and is modeled after the American Society for Non-destructive Testing, Recommended Practice Number, SNT-TC-1A, requirements. The examiner is required to maintain proficiency and periodically attend formal training every three years to maintain this certification.

Additionally, during each Mode 3 walkdown, either for the GL 88-05 walkdown at the beginning of an outage or the ASME Code required walkdown at the end of an outage, the

examiners are required to attend a pre-job brief. At this pre-job brief, industry events are reviewed and a heightened level of awareness is developed for these industry events.

The formal training required to maintain VT-2 certification is structured to meet the requirements of the ASME Code. The lessons learned from industry events are incorporated into the pre-job briefs that are given prior to the various walkdowns being performed. This ensures a more timely analysis of the industry events as they apply to the station and to the specific area to be examined.

5. *Response to Leakage*

Braidwood Station is diligent in identifying leaks and ensures that each instance of finding boric acid is properly evaluated. Current acceptance criteria as specified by Engineering procedure ER-AA-330-001, "Section XI Pressure Testing," requires that any relevant/recordable indication be evaluated against the standards of IWB-3522. Additionally in accordance with GL 91-18, "Information to Licensees Regarding NRC Inspection Manual Section of Resolution of Degraded and Nonconforming Conditions," through wall leakage is not allowed in Class 1 and 2 systems.

Other leakage found during the periodic walkdowns is repaired as soon as possible. Leakage in containment that is from a bolted connection does not have a specific leakage limit since it is a bolted connection and falls outside of the ASME Code requirements. However, the normal course of action is to write a work request and repair the leakage as soon as possible.

Technical Specification 3.4.13, "RCS Operational Leakage," requires that unidentified leakage be less than one gallon per minute. In addition the station monitors both identified leakage and unidentified leakage and performs a reactor coolant system water inventory balance on a 72-hour frequency. The reactor containment is monitored for increases in radiation and sump levels. Alarms are provided to alert operators of indications of increased leakage. Any new leakage is aggressively pursued for identification, up to and including making containment entries to identify the sources. Every effort is taken to identify leakage and address that leakage through evaluation or, if possible, scheduled repairs.

Site procedures/processes contain specific direction for evaluating evidence of leakage which is documented on a "Recordable Indication Record." The examiner, at a minimum, is required to initiate a work request to clean the affected area and to notify Engineering to evaluate the leak.

All boric acid leaks have work requests generated to remove the accumulated boric acid followed up by a proceduralized evaluation of the affected component for degradation and possible repair actions. If a leak can not be cleaned, an evaluation is completed to determine acceptability and identify compensatory measures that may be required to limit any subsequent degradation.

6. *Review of Program Effectiveness*

GL 88-05 inspections are considered part of the Inservice Inspection (ISI) Pressure Test Program within the ASME ISI program, including the Augmented ISI items. Braidwood

Station periodically assesses the conduct of the overall ISI program through Focused Area Self Assessments (FASA). We will ensure that the next ISI FASA includes a specific review of elements within the boric acid inspection program. Program enhancements will be implemented as appropriate. The Nuclear Oversight Department also conducts periodic assessments of ISI program activities.

A direct result of the program effectiveness has been the reduction in size of leaks that are periodically found. These leaks are usually very small in size, affecting only the component itself.

When boric acid leaks are identified during the periodic exams, the station standard operating practice as defined by our Recordable Indication Program requires that, at a minimum, a work request be written to address the boric acid leak. Repairs are subsequently conducted during the outage or placed in the normal daily 13-week schedule. Critical repairs can be expedited depending on the nature of the leak and the function of the applicable component.

Braidwood Station also has a program called Condition Based Monitoring that allows for the periodic review of components that may have a condition that does not require immediate repair/remediation but can be monitored over time to determine what course of action is required.

Byron Station and Braidwood Station Engineers communicate on a regular basis when issues are identified. In addition, Corporate Engineering supplies pertinent information from industry experiences and industry groups (e.g. MRP). This communication ensures a uniform response to these issues.

ATTACHMENT 3

Sixty-Day Response to NRC Bulletin 2002-01 "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity"

Byron Station, Units 1 and 2

Exelon Generation Company, LLC

Attachment 3

Sixty-Day Response to NRC Bulletin 2002-01

Byron Station Units 1 and 2

On March 18, 2002, the NRC issued NRC Bulletin 2002-01, "Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity." The below information is required within 60 days of the date of the bulletin.

"*The basis for concluding that your boric acid inspection program is providing reasonable assurance of compliance with the applicable regulatory requirements discussed in Generic Letter 88-05 and this bulletin. If a documented basis does not exist, provide your plans, if any, for a review of your program.*"

Byron Station has reasonable assurance that the boric acid inspection program complies with the requirements discussed in Generic Letter (GL) 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and NRC Bulletin 2002-01 as discussed in our response below.

This response was developed using the guidance provided by the Nuclear Energy Institute (NEI) for the Materials Reliability Program (MRP). These guidelines were transmitted to licensees in a letter from Alex Marion (NEI) to NEI Administrative Points of Contact, "Guidance for 60-day Response to NRC Bulletin 2002-01," dated April 16, 2002. The response addresses the following topics:

1. Program Definition and Responsibility
2. Inspection Scope and Frequency
3. Obstructions to Visual Inspections
4. Training
5. Response to Leakage
6. Review of Program Effectiveness

1. *Program Definition and Responsibility*

   Byron Station has incorporated the requirements discussed in GL 88-05 into several station and corporate procedures. These procedures provide inspection requirements and the direction for evaluation and/or repair when boric acid leaks are identified.

   The following procedures contain references to GL 88-05:

   - BVP 200-7, "Conduct of Pressure Testing Activities"
   - BVP 200-7T1, "ASME Class 1, 2 and 3 Inservice Pressure Test Checkoff List"
   - 1/2BVSR 4.f.2-12, "Unit _ Visual Examination (VT-2) of ASME Class 1, 2 and 3 Bolted Connections"
   - 1/2BVSR 4.f.2-4, "Unit _ Scheduled 10 Year Visual Examination (VT-2) of Class 1 Components At Nominal Operating Pressures"
   - 1/2BVSR XII-1, "Unit _ Primary Coolant Sources Outside Containment Visual Examination (Leakage Test)"
   - 1/2BVSR XII-2, "Unit _ Primary Coolant Sources Outside Containment Gaseous Leak Testing"
   - BVP 200-10, "ISI/IST Recordable Indication Investigations"
   - 1/2BVSR 4.f.2-11, "Unit _ Nonroutine Visual Examination (VT-2) of Class1, 2 and 3 Components at Nominal Operating Pressures"

- ER-AA-330-001, "Section XI Pressure Testing"

The responsibility for the GL 88-05 Program is assigned to the Byron Station Engineering Department.

As part of the characterization and dispositioning of boric acid leaks identified during the American Society of Mechanical Engineers (ASME) Section XI, "Rules for Inservice Inspection of Nuclear power Plant Components," VT examinations, the examiner is required to complete proceduralized checklists that provide a structured approach to evaluating the leak. This process requires that the boric acid leak be cleaned and an evaluation performed addressing the extent of degradation that may have occurred. Follow-up work requests for repair are generated as necessary. The leaks are placed into two categories, active and non-active. The majority of the leaks found are minor packing leaks or body to bonnet leaks. All of the non-active leaks are cleaned and evaluated for degradation of the base materials. Active leaks are prioritized and repaired as necessary.

2. *Inspection Scope and Frequency*

Operating Department monitors on-line leakage as part of the Technical Specification requirements for identified and unidentified leakage. When on-line containment entries are performed, personnel report identification of boric acid leakage by writing work requests. The GL 88-05 Program requires that a pre-outage examination be completed in containment. Additionally, pressure test VT-2 examinations are conducted in containment during outages and a post outage ASME VT-2 examination is completed. These VT-2 inspections include all Class 1 components.

Walkdowns are completed for GL 88-05 every cycle during the outage/shutdown in Mode 3 and a second walkdown is completed in Mode 3 every cycle prior to startup as required by ASME Section XI. In addition, Engineering personnel walkdown the accessible portions of their systems once per quarter and the non-accessible portions of their systems during an outage looking for material condition issues, which includes boric acid leaks.

All ASME Class 2 and 3 systems, which include all borated systems, are examined every Inservice Inspection period. VT-2 qualified individuals perform all these examinations. All Class 1 systems are examined each refueling outage.

In accordance with the ASME Section XI Code, examinations may be performed with the insulation in place. However, systems that are borated for the purpose of controlling reactivity are required to have the insulation removed from all bolted connections, including manways, to determine their condition. The ASME Class 1 bolted connections are completed each refueling (i.e., 18 months) and the ASME Class 2 and 3 bolted connections are examined every Inservice Inspection period.

In accordance with our VT-2 procedure, any evidence of boric acid is considered a "Recordable Indication," and must be evaluated and dispositioned. This requires the generation of a work request for cleaning as a minimum.

The Operating Experience (OPEX) process screens, evaluates, and acts on OPEX documents and information from internal sources (i.e., other Exelon facilities) and external sources (e.g., INPO, NRC, vendors). Subject Matter Experts (SMEs) are assigned, as

appropriate, to perform a detailed review of these OPEX documents using the OPEX process. As part of the review process, the SME formulates actions necessary to appropriately address affected items such as procedure revisions, program scope changes, training, and preventative maintenance frequencies. Operability issues, identified during the OPEX review process, are documented in the Corrective Action Program and evaluated through the Operability Determination process.

3. *Obstructions to Visual Inspections*

As previously stated above, bolted connections that are insulated will have their insulation removed on a periodic basis for examination. This ensures that leaks are detected early and dispositioned. This includes the reactor vessel flange, steam generator manways and pressurizer manway.

Byron Station completed the Unit 1 reactor vessel head inspection during the recent 2002 Spring refueling outage (B1R11). The results of this inspection were provided to the NRC in a letter from R. P. Lopriore (Exelon Generation Company, LLC), "Byron Station Unit 1 Response to NRC Bulletin 2002-01, 'Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity,'" dated April 26, 2002. Byron Station is evaluating the extent of the visual examination of the Unit 2 reactor vessel head during the Fall 2002 refueling outage (B2R10). Byron Station will also monitor the NEI MRP recommendations and factor them into future outage planning as appropriate.

Inspection techniques are specifically identified for the areas with obstructed visibility such as the Reactor Vessel Head. The mirror insulation is not easily removed and the use of boroscopes will be required for performance of bare metal head examinations.

4. *Training*

All persons performing visual examinations, whether for GL 88-05 or ASME Section XI Code exams, are required to be VT-2 certified. This certification requires specific training and experience requirements and is modeled after the American Society for Non-destructive Testing, Recommended Practice Number, SNT-TC-1A, requirements. The examiner is required to maintain proficiency and periodically attend formal training every three years to maintain this certification.

Additionally, during each Mode 3 walkdown, either for the GL 88-05 walkdown at the beginning of the outage or the ASME Code required walkdown at the end of the outage, the examiners are required to attend a pre-job brief. At this pre-job brief, industry events are reviewed and a heightened level of awareness is developed for these industry events.

The formal training required to maintain VT-2 certification is structured to meet the requirements of the ASME Code. The lessons learned from industry events are incorporated into the pre-job briefs that are given prior to the various walkdowns being performed. This ensures a more timely analysis of the industry events as they apply to the station and to the specific area to be examined.

5. *Response to Leakage*

Byron Station is diligent in identifying leaks and ensures that each instance of finding boric acid is properly evaluated. Current acceptance criteria as specified by Engineering

procedure ER-AA-330-001, "Section XI Pressure Testing," requires that any relevant/recordable indication be evaluated against the standards of IWB-3522. Additionally in accordance with GL 91-18, "Information to Licensees Regarding NRC Inspection Manual Section of Resolution of Degraded and Nonconforming Conditions," through wall leakage is not allowed in Class 1 and 2 systems.

Other leakage found during the periodic walkdowns is repaired as soon as possible. Leakage in containment that is from a bolted connection does not have a specific leakage limit since it is a bolted connection and falls outside of the ASME Code requirements. However, the normal course of action is to write a work request and repair the leakage as soon as possible.

Technical Specification 3.4.13, "RCS Operational Leakage," requires that unidentified leakage be less than one gallon per minute. In addition, Byron Station monitors both identified leakage and unidentified leakage and performs an reactor coolant system water inventory balance on a 72-hour frequency. The reactor containment is monitored for increases in radiation and sump levels. Alarms are provided to alert operators of indications of increased leakage. Any new leakage is aggressively pursued for identification, up to and including making containment entries to identify the sources. Every effort is taken to identify leakage and address that leakage through evaluation or, if possible, scheduled repairs.

Site procedures/processes contain specific direction for evaluating evidence of leakage which is documented on a "Recordable Indication Record." The examiner, at a minimum, is required to initiate a work request to clean the affected area and to notify Engineering to evaluate the leak.

All boric acid leaks have work requests generated to remove the accumulated boric acid followed up by a proceduralized evaluation of the affected component for degradation and possible repair actions. If a leak can not be cleaned, an evaluation is completed to determine acceptability and identify compensatory measures that may be required to limit any subsequent degradation.

6. *Review of Program Effectiveness*

GL 88-05 inspections are considered part of the Inservice Inspection (ISI) Pressure Test Program within the ASME ISI program, including the Augmented ISI items. Byron Station periodically assesses the conduct of the overall ISI program through Focused Area Self Assessments (FASA). We will ensure that the next ISI FASA includes a specific review of elements within the boric acid inspection program. Program enhancements will be implemented as appropriate. The Nuclear Oversight Department also conducts periodic assessments of ISI program activities.

A direct result of the program effectiveness has been the reduction in size of leaks that are periodically found. These leaks are usually very small in size, affecting only the component itself.

When boric acid leaks are identified during the periodic exams, the station standard operating practice as defined by our Recordable Indication Program requires that, at a minimum, a work request be written to address the boric acid leak. Repairs are subsequently conducted during the outage or placed in the normal daily 13-week

schedule. Critical repairs can be expedited depending on the nature of the leak and the function of the applicable component.
Byron Station also has a program called Condition Based Monitoring (CBM) that allows for periodic the review of components that may have a condition that does not require immediate repair/remediation but can be monitored over time to determine what course of action is required.

Byron Station and Braidwood Station Engineers communicate on a regular basis when issues are identified. In addition, Corporate Engineering supplies pertinent information from industry experiences and industry groups (e.g. MRP). This communication ensures a uniform response to these issues.