

From: Borromeo, Joshua
Sent: Wednesday, June 14, 2017 8:17 AM
To: Scarbrough, Thomas
Cc: Beaton, Robert; Clark, Theresa
Subject: RE: EPRI Test Data

Thanks for the help Tom, I'll let you know if we need anything else.

From: Scarbrough, Thomas
Sent: Wednesday, June 14, 2017 8:16 AM
To: Borromeo, Joshua <Joshua.Borromeo@nrc.gov>
Cc: Beaton, Robert <Robert.Beaton@nrc.gov>; Clark, Theresa <Theresa.Clark@nrc.gov>
Subject: RE: EPRI Test Data

Josh,

The NRC Records Retrieval staff was not able to locate EPRI NP-2770, Volume 6, in the NRC archives.

The EPRI website provided an abstract, but the fee for the full document was expensive.

Nick Difrancesco helped with the search effort. Nick sent a hyperlink to a Carolina Power document that included safety valve testing. <http://www.nrc.gov/docs/ML1418/ML14184A288.pdf>

Please let me know if I can help with any other documents.

Thanks.
Tom

From: Clark, Theresa
Sent: Tuesday, June 13, 2017 5:28 PM
To: Borromeo, Joshua <Joshua.Borromeo@nrc.gov>
Cc: Beaton, Robert <Robert.Beaton@nrc.gov>; Scarbrough, Thomas <Thomas.Scarbrough@nrc.gov>
Subject: RE: EPRI Test Data

Hi Josh—yes, that is one of the documents that we thought about, but I can't remember how/if we found it. We referenced it in the appeal panel report as **EPRI 1983: EPRI, NP-2770-LD, Volume 6, "EPRI/C-E PWR Safety Valve Test Report: Test Results for Crosby Safety Valve," dated March 1983. Publicly available from EPRI for a fee.**

Tom Scarbrough (on cc: here) had put in a records request to see if it could be found after I struck out on initial requests, but I can't remember whether he did find it. Tom, could you help these NRR folks out? Thanks!

--

Theresa Valentine Clark
Executive Technical Assistant (Reactors)
U.S. Nuclear Regulatory Commission
Theresa.Clark@nrc.gov | 301-415-4048 | O-16C33

From: Borromeo, Joshua
Sent: Tuesday, June 13, 2017 4:59 PM

To: Clark, Theresa <Theresa.Clark@nrc.gov>
Cc: Beaton, Robert <Robert.Beaton@nrc.gov>
Subject: FW: EPRI Test Data

Theresa – I'm working on the 120-Day plan related to the By/Br Backfit appeal. We're looking for a document, EPRI NP-2770-LD Volume 6. I was wondering this is one that you were able to locate when reviewing the backfit.

Thanks.

Josh Borromeo

U.S. Nuclear Regulatory Commission
Reactor Systems Engineer
NRP/DSS/SRXB
(301) 415-1217

From: Rudland, David

Sent: Wednesday, May 31, 2017 3:33 PM

To: Wrona, David <David.Wrona@nrc.gov>

Cc: Sheng, Simon <Simon.Sheng@nrc.gov>; Dijamco, David <David.Dijamco@nrc.gov>; Caponiti, Kathleen <Kathleen.Caponiti@nrc.gov>; Purnell, Blake <Blake.Purnell@nrc.gov>; Bloomfield, Mona Lisa <MonaLisa.Bloomfield@nrc.gov>; Weaver, Tonna <Tonna.Weaver@nrc.gov>

Subject: Safety Evaluation - Exelon Units - Alternative to RPV Flange Thread Exams - MF8712 through 8729, 9548

David,

In accordance with the guidance in LIC-102, Revision 2, please find attached the EVIB SE associated with TAC Nos. MF8712 through 8729, 9548. The transmittal of this E-mail documents EVIB's concurrence with the attached SE. DE's Administrative Assistant will place this E-mail and attachment into ADAMS to document the completion of our review and will provide the ADAMS ML No. to the Exelon Project Manager.

Thanks
Dave

David L. Rudland, Ph.D.
Chief, Vessels and Internals Integrity Branch
Division of Engineering
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Stop: OWFN-9H6
11555 Rockville Pike
Rockville, MD 20852-2738
Office: (301) 415-1896
Cell: (b)(6)
Email: david.rudland@nrc.gov

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Withheld pursuant to exemption

(b)(5)

of the Freedom of information and Privacy Act

~~This attachment contains personally identifiable information. Withhold from public disclosure under 10 CFR 2.390. When separated from the Attachment, the cover letter is decontrolled.~~

ATTACHMENT
Updated OODEP Lists

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Exelon Corporation Board of Directors

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|---|-----------------------|-----|------------------------|----------------------|--|
| Director | Anthony K. Anderson | | (b)(6) | | |
| Director | Ann C. Berzin | | | | |
| Director, President and Chief Executive Officer | Christopher M. Crane | | | | |
| Director | Yves C. de Balmann | | | | |
| Director | Nicholas DeBenedictis | | | | |
| Director | Paul Joskow | | | | |
| Director | Robert J. Lawless | | | | |
| Director | Richard W. Mies | | | | |
| Director | John W. Rogers | | | | |
| Chairman and Director | Mayo A. Shattuck III | | | | |
| Director | Stephen D. Steinour | | | | |
| Director | Linda P. Jojo | | | | |
| Director | Nancy L. Gioia | | | | |

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Exelon Corporation Officers

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|---|---------------------------|-----|------------------------|----------------------|--|
| Executive Vice President and Chief Enterprise Risk Officer | Paymon Aliabadi | | (b)(6) | | |
| Senior Executive Vice President and Chief Commercial Officer | Kenneth W. Cornew | | | | |
| President and Chief Executive Officer | Christopher M. Crane | | | | |
| Senior Executive Vice President and Chief Executive Officer, Exelon Utilities | Denis P. O'Brien | | | | |
| Senior Executive Vice President and Chief Financial Officer | Jonathan W. Thayer | | | | |
| Senior Executive Vice President and Chief Strategy Officer | William A. Von Hoene, Jr. | | | | |
| Senior Vice President and Corporate Secretary | Bruce G. Wilson | | | | |
| Senior Vice President and Treasurer | Shravan Chopra | | | | |

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Exelon Generation Company, LLC Officers

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|--|--------------------|-----|------------------------|----------------------|--|
| Executive Vice President and Chief Operating Officer | Michael J. Pacilio | | (b)(6) | | |
| President, Exelon Nuclear, Senior Vice President and Chief Nuclear Officer | Bryan C. Hanson | | | | |

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Exelon Generation Company, LLC Executive Personnel

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|--|-------------------------|-----|------------------------|----------------------|--|
| Chief Operating Officer, Fleet Operations, Exelon Nuclear | David P. Rhoades | | (b)(6) | | |
| Senior Vice President, Midwest Operations | Daniel J. Enright | | | | |
| Senior Vice President, West Operations | Faber A. Kearney | | | | |
| Senior Vice President, Mid-Atlantic Operations | Thomas J. Dougherty III | | | | |
| Senior Vice President, Northeast Operations | Christopher H. Mudrick | | | | |
| Senior Vice President – Regulatory Affairs, Assistant Secretary, and General Counsel | J. Bradley Fewell | | | | |
| Vice President, Licensing and Regulatory Affairs | Keith R. Jury | | | | |
| Site Vice President, Braidwood | Marri Marchionda-Palmer | | | | |
| Site Vice President, Byron | Mark E. Kanavos | | | | |
| Site Vice President, Clinton | Theodore R. Stoner | | | | |
| Site Vice President, Dresden | Peter J. Karaba | | | | |
| Site Vice President, FitzPatrick | Joseph E. Pacher | | | | |
| Site Vice President, LaSalle | William J. Trafton | | | | |
| Site Vice President, Limerick | Richard W. Libra | | | | |
| Site Vice President, Oyster Creek | Timothy A. Moore | | | | |
| Site Vice President, Peach Bottom | Patrick D. Navin | | | | |
| Site Vice President, Quad Cities | Scott D. Darin | | | | |
| Site Vice President, Three Mile Island | Edward W. Callan | | | | |

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Exelon Generation Company, LLC Facility Security Officers

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|--|---------------------|-----|------------------------|----------------------|--|
| Site Security Manager, Dresden | Laurie S. Antos | | (b)(6) | | |
| Site Security Manager, Braidwood | Brian S. Finlay | | | | |
| Site Security Manager, Quad Cities | Archie R. Williams | | | | |
| Site Security Manager, LaSalle | Dennis A. Bakalar | | | | |
| Site Security Manager, Clinton | William Marsh | | | | |
| Site Security Manager, Byron | Curtis E. Catencamp | | | | |
| Site Security Manager, Limerick | John Mcgee | | | | |
| Site Security Manager, Three Mile Island | Randy S. Campbell | | | | |
| Site Security Manager, Oyster Creek | Timothy W. Keenan | | | | |
| Site Security Manager, Peach Bottom | Shelly C. Griffith | | | | |
| Site Security Manager, FitzPatrick | Tim E. Redfearn | | | | |
| Site Security, Cantera | William J. Ellis | | | | |
| Site Security, Kennett Square | Wayne A. Trump | | | | |

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Calvert Cliffs Nuclear Power Plant, LLC

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|-----------------------|---------------------------|-----|------------------------|----------------------|--|
| President | William A. Von Hoene, Jr. | | (b)(6) | | |
| Senior Vice President | Bryan C. Hanson | | | | |
| Senior Vice President | Christopher H. Mudrick | | | | |
| Vice President | Mark D. Flaherty | | | | |
| Treasurer | Shravan Chopra | | | | |
| Assistant Treasurer | Elisabeth J. Graham | | | | |
| Secretary | Bruce G. Wilson | | | | |
| Site Security Manager | Tuane L. Young | | | | |

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Nine Mile Point Nuclear Power Plant, LLC

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|-----------------------|---------------------------|-----|------------------------|----------------------|--|
| President | William A. Von Hoene, Jr. | | (b)(6) | | |
| Senior Vice President | Bryan C. Hanson | | | | |
| Senior Vice President | Christopher H. Mudrick | | | | |
| Vice President | Peter M. Orphanos | | | | |
| Treasurer | Shravan Chopra | | | | |
| Assistant Treasurer | Elisabeth J. Graham | | | | |
| Secretary | Bruce G. Wilson | | | | |
| Site Security Manager | Michael K. Kunzwiler | | | | |

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R.E. Ginna Nuclear Power Plant, LLC

| POSITION TITLE(S) | NAME | SSN | COUNTRY OF CITIZENSHIP | OWNERSHIP PERCENTAGE | SECURITY CLEARANCE LEVEL/STATUS/AGENCY |
|-----------------------|---------------------------|-----|------------------------|----------------------|--|
| President | William A. Von Hoene, Jr. | | (b)(6) | | |
| Senior Vice President | Bryan C. Hanson | | | | |
| Senior Vice President | Christopher H. Mudrick | | | | |
| Vice President | William B. Carsky | | | | |
| Treasurer | Shravan Chopra | | | | |
| Assistant Treasurer | Elisabeth J. Graham | | | | |
| Secretary | Bruce G. Wilson | | | | |
| Site Security Manager | Daniel Keneston (acting) | | | | |

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~~PROOP~~

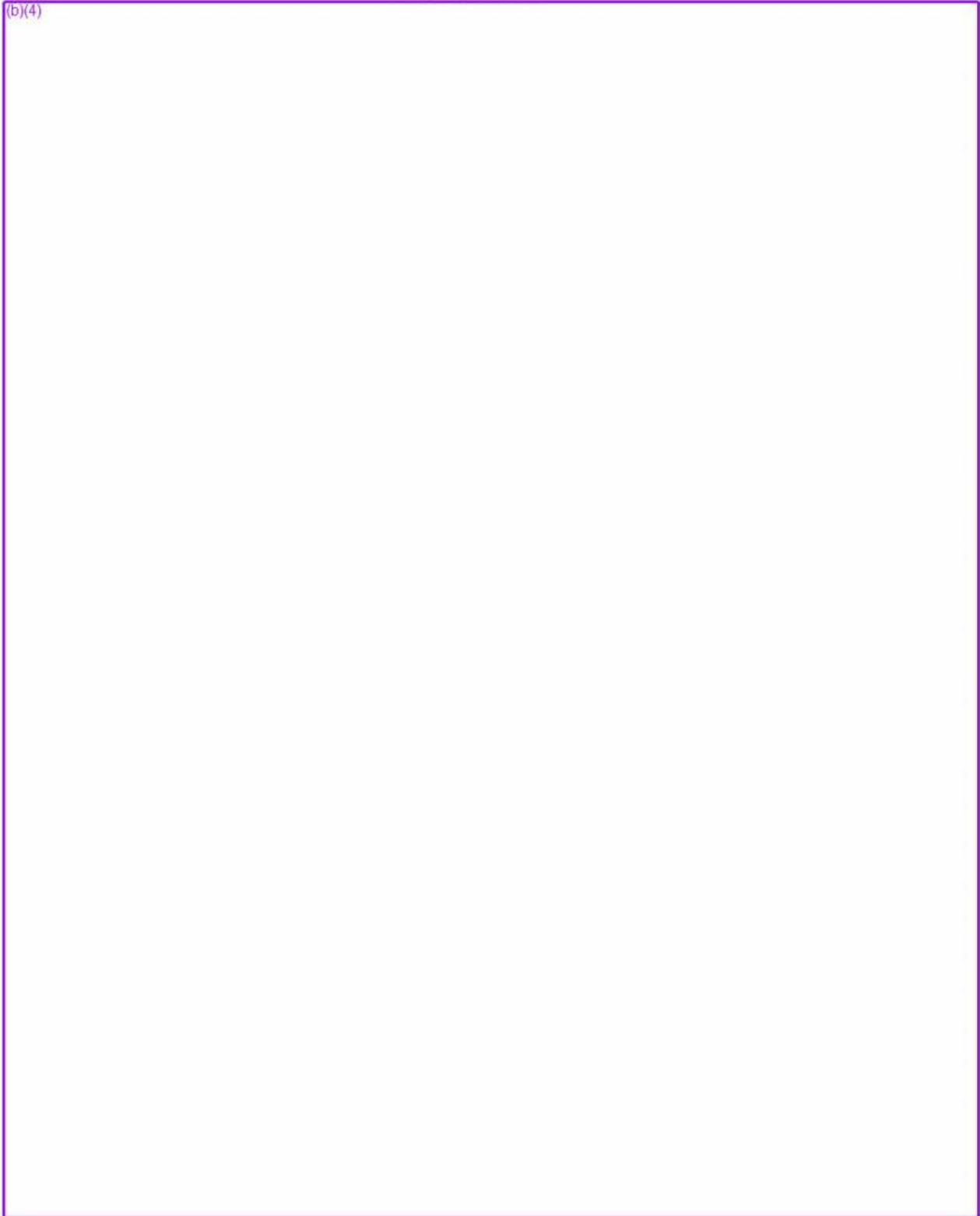
ATTACHMENT 1

EGC responses to "Preliminary RAIs for Braidwood and Byron Post Peening Relief Requests," dated June 14, 2017

ATTACHMENT 1
EGC responses to "Preliminary RAIs for Braidwood and Byron Post Peening Relief Requests," dated June 14, 2017

~~PROPRIETARY~~

(b)(4)



**Committee to Review Generic Requirements
Informational Briefing for NRC Office Directors
Preliminary Response to EDO Backfitting/Issue Finality Process Tasking
June 8, 2017**

Note: *For purposes of this paper, references to backfit and backfitting also include issue finality.*

Preliminary Key Findings and Messages

- CRGR is completing its response to an EDO tasking on backfitting related to guidance, training, knowledge management, recent events, and new Commission direction.
- Of external stakeholders, reactor licensees and NEI are most involved in backfitting and are concerned about staff using the compliance exception to justify facility-specific backfits and about the potential for inspection and oversight activities to result in inappropriate backfits.
- While there are some exceptions, agency staff have generally recognized potential backfit issues and addressed them through the appropriate process. Nevertheless, improvement is both needed and reasonably achievable.
- Staff knowledge and capabilities can be improved through investments in guidance, procedures, training, and knowledge management products. Training should yield the greatest improvement.
- Today's issues include repeats of those from previous reviews. More management attention is needed to set and meet expectations, and to achieve durable corrective actions.
- Some informal processes used by the staff do not include a careful backfitting review, and may warrant further attention.

What's the background?

Two EDO memos - June 2016, to assess requirements, guidance, training, and knowledge management; and December 2016, to consider revisions to CRGR charter, and to consider actions since the June memo (primarily the response to the Exelon appeal and new Commission direction in response to OGC advice).

In large part, the tasking was about addressing a rise in internal and external questions and concerns about backfitting.

How did CRGR approach its tasking?

Held two well-attended public meetings (September 2016 and February 2017). Licensees, NEI, UCS, and members of the public provided oral and written input and perspectives for our consideration.

Met with staff and managers in OGC, regulatory offices, and regions to review NRC requirements and guidance (e.g., office implementing procedures), training, and knowledge management.

Reviewed previous assessments (e.g., 2002 CRGR assessment, 2009 OIG audit, CRGR annual and five-year assessments, etc.), the report of the Exelon backfit appeal review panel and insights the review panel had provided for our consideration, the OGC's recommendations to the Commission concerning cost considerations and the use of the compliance exception and the use of General Design Criteria as bases for backfits using the compliance exception. We also reviewed the CRGR charter against our experience applying the charter over the past few years, as well as the findings and likely corrective actions to be taken as a result of the EDO tasking.

Throughout this effort, we followed the NRC Principles of Good Regulation (independence, openness, efficiency, clarity, and reliability) and the Project Aim principle of seeking opportunities to increase agility, effectiveness, and efficiency.

What did CRGR find?

We did not find many instances where licensees or NEI expressed backfitting concerns about generic issues that were handled through a formal agency process, such as rulemaking, or that were reviewed by CRGR.

Conversely, we found that licensees and NEI have raised questions and concerns about inappropriate facility-specific issues and backfits. Even so, there are few specific examples on the docket, with only two issues appealed to the EDO since 2011 (Hatch degraded voltage configuration (2011), which was upheld, and Byron/Braidwood pressurizer safety valve failures (2016), which was overturned).

From our assessment, we also concluded that reactor licensees and NEI are concerned about inappropriate facility-specific backfits and the use of the compliance exception to justify facility-specific backfits, which they believe is overused. (The staff had relied on the compliance exception to justify both the Hatch and Byron/Braidwood backfits that were subsequently appealed to the EDO.)

We heard strong statements from reactor licensees and NEI that their main concern is the potential for staff to inappropriately backfit a reactor site during or because of inspection and oversight activities.

Overall, we believe the staff has done a good job of handling backfitting issues using available resources. Most criticisms of the staff's performance regarding backfitting appear to be based on hearsay and anecdotal information. Nevertheless, staff skills, knowledge, and abilities can be improved through relatively modest investments in updated and improved guidance, training, and knowledge management products. Our report will include recommendations and specific corrective actions.

Examples, most of which are currently underway, include:

- Improving training for lawyers, technical reviewers, licensing staff, and inspectors on backfitting, the differences between a clarification and a change in staff position, how to change a staff position, and how to adopt a new staff position.
- Updating MD 8.4, "Management of Facility-Specific Backfitting and Information Collection," to reflect, as examples, fact of life changes and the new Commission direction.
- Updating the "Backfitting Guidelines" (NUREG-1409).
- Making conforming changes to office and region implementing procedures, including more standardization across the agency.
- Developing new KM products, e.g., history of CRGR.

We also concluded that the CRGR has done a good job of meeting its role and responsibilities as specified in its charter. Nevertheless, we will recommend to the EDO that the CRGR charter be revised to reflect fact of life changes and to clarify the CRGRs roles and responsibilities in several areas, e.g., availability to assist on plant-specific backfit issues when requested by senior management.

Some of the issues or gaps we identified are repeats of issues documented in previous backfitting reviews (2002, 2009). While the updated and improved guidance, training, knowledge management resources, and other corrective actions we will propose are certainly important and necessary, as an agency, we should also focus more attention on durable corrective actions, messaging and expectations related to backfitting and issue finality. This enhanced management attention and oversight could be treated by the agency as a management or organizational challenge.

We believe improved training and increased management involvement have the greatest potential to effect change.

Some processes used by the staff (e.g., FAQs and correspondence issued directly to licensees), which may not receive the same rigor of backfitting review, may warrant further review and consideration. This could be done, for example, by the offices and regions as they make conforming changes to their implementing procedures, with review of the results by the CRGR.

What's left to do?

Informational briefing for DEDOs and EDO (June 15, 2017).

Complete report. (Due to EDO by June 27, 2017.)

Complete communications plan, including proposal for rollout to staff (and external stakeholders?).

Complete rollout and corrective actions.

We will take credit for this work to satisfy the CRGR charter requirement for a five-year CRGR assessment of backfitting. To help assess the durability of the corrective actions, including any increase in management involvement, we will recommend that the EDO refer our report to the Lessons Learned Oversight Board and direct that an effectiveness review be performed within five years.

Thank you – Anne Boland, Ed Hackett, Brian McDermott, John Monninger, Scott Moore, Len Wert, Steve West, and Ed Williamson – the CRGR members.

**Talking Points For
Committee to Review Generic Requirements
EDO and DEDO Informational Briefing
Preliminary Response to EDO Backfitting/Issue Finality Process Tasking
June 15, 2017**

Note: *References to backfit and backfitting include issue finality.*

Messages and Preliminary Findings

- CRGR is completing its response to an EDO tasking on backfitting related to guidance, training, knowledge management, recent events, and new Commission direction.
- Of external stakeholders, reactor licensees and NEI are most involved in backfitting and are concerned about staff using the compliance exception to justify facility-specific backfits and about the potential for inspection and oversight activities to result in inappropriate backfits.
- While there are some exceptions, agency staff have generally recognized potential backfit issues and addressed them through the appropriate process. Nevertheless, improvement is both needed and is reasonably achievable.
- Staff knowledge and capabilities can be improved through investments in guidance, procedures, training, and knowledge management products. Training should yield the greatest improvement.
- Today's issues include repeats of those from previous reviews. More management attention is needed to achieve durable corrective actions and to set and meet expectations regarding backfitting.
- Some processes used by the staff do not include a careful backfitting review, and may warrant further attention.

What's the background?

Two EDO memos - June 2016, to assess requirements, guidance, training, and knowledge management; and December 2016, to consider revisions to CRGR charter, and to consider actions since the June memo (primarily the response to the Exelon appeal and new Commission direction in response to OGC advice).

In large part, the tasking spoke to a rise in internal and external questions and concerns about backfitting.

We briefed the office directors and regional administrators on June 8, 2017. Overall, a positive and supportive response.

How did CRGR approach its tasking?

We were guided by our Principles of Good Regulation (independence, openness, efficiency, clarity, and reliability) and the Project Aim principle of seeking opportunities to increase agility, effectiveness, and efficiency.

Held two well-attended public meetings (September 2016 and February 2017). Licensees, NEI, UCS, and members of the public provided oral and written input and perspectives for our consideration.

Met with staff and managers in OGC, regulatory offices, and regions to review NRC requirements and guidance (e.g., office implementing procedures), training, and knowledge management.

Reviewed previous backfitting assessments (e.g., 2002 CRGR assessment, 2009 OIG audit, CRGR annual and five-year assessments, etc.), the report of the Exelon backfit appeal review panel and insights the review panel had provided for our consideration, the OGC's recommendations to the Commission concerning cost considerations and the use of the compliance exception and the use of General Design Criteria as bases for backfits using the compliance exception.

We also reviewed the CRGR charter against our experience in applying the charter over the past few years, as well as the findings and the corrective actions proposed as a result of the EDO tasking.

What did CRGR find?

We did not find many instances where licensees or NEI expressed backfitting concerns about generic issues that were handled through a formal agency process, such as rulemaking, or that were reviewed by CRGR.

Conversely, we found that licensees and NEI have raised questions and concerns about inappropriate facility-specific issues and backfits. Even so, there are few specific examples on the docket, with only two issues appealed to the EDO since 2002 (Hatch degraded voltage configuration (2011), which was upheld, and Byron/Braidwood pressurizer safety valve failures (2016), which was overturned).

From our assessment, we also concluded that reactor licensees and NEI are concerned about inappropriate facility-specific backfits and the use of the compliance exception to justify facility-specific backfits, which they believe is overused. (The staff had relied on the compliance exception to justify both the Hatch and the Byron/Braidwood backfits that were subsequently appealed to the EDO. The first was upheld and the second was overturned.)

We heard strong statements from reactor licensees and NEI that their main concern is the potential for staff to inappropriately backfit a reactor site during or as a result of inspection and oversight activities.

Overall, we believe the staff have generally recognized potential backfit issues and addressed them through the appropriate process using available tools and resources. Complaints about the staff's performance regarding backfitting are often nonspecific and based on anecdotal information rather than documented examples. Nevertheless, for a forward-looking perspective, staff skills, knowledge, and abilities can be improved through relatively modest investments in updated and improved guidance, training, and knowledge management products.

Our report will include recommendations and specific corrective actions. Examples, most of which are currently underway, include:

- Improving training for our inspectors, technical reviewers, licensing staff, and lawyers on backfitting, the differences between a clarification and a change in staff position, how to change a staff position, and how to adopt a new or revised staff position.
- Updating guidance, like the "Backfitting Guidelines" (NUREG-1409) and MD 8.4, "Management of Facility-Specific Backfitting and Information Collection," to reflect, as examples, fact of life changes and the new Commission direction.
- Making conforming changes to implementing procedures, including more standardization across the agency.
- Developing new KM products, e.g., history of CRGR.

We also concluded that the CRGR is meeting its roles and responsibilities as specified in its charter. We considered, but will not recommend any changes to the CRGR's role. Nevertheless, we will recommend revision to the CRGR charter to reflect fact of life changes and to clarify or highlight certain current CRGRs roles and responsibilities, e.g., review of guidance and procedures, availability to help with facility-specific backfit issues as requested.

Some of the issues or gaps we identified are repeats of issues documented in previous backfitting reviews (2002, 2009). While the updated and improved guidance, training, knowledge management resources, and other corrective actions we will propose are important and necessary, we should focus appropriate management attention on achieving durable corrective actions, and on messaging and expectations regarding backfitting and issue finality. Enhanced management attention and oversight could be treated as a leadership or organizational challenge.

We believe improved training and increased management involvement have the greatest potential to effect change.

We will take credit for the effort discussed in this informational briefing and in our report to the EDO to satisfy the CRGR charter requirement for a five-year CRGR assessment of backfitting. To help assess the durability of the corrective actions, including any increase in management involvement, we will recommend that the EDO refer our report to the Lessons Learned Oversight Board and direct that an effectiveness review be performed within five years.

Some processes used by the staff (e.g., FAQs and correspondence issued directly to licensees), which may not receive the same rigor of backfitting review, may warrant further review and consideration. This could be done, for example, by the offices and regions as they make conforming changes to their implementing procedures, with review of the results by the CRGR.

What's left to do?

Complete report. (Due to EDO by June 27, 2017.)

Complete communications plan, including proposal for rollout to staff (and external stakeholders?).

Complete rollout and corrective actions.

Thank you – Anne Boland, Ed Hackett, Brian McDermott, John Monninger, Scott Moore, Len Wert, Steve West, and Ed Williamson – the members of the CRGR.

Holahan, Gary

From: Holahan, Gary
Sent: Tuesday, April 18, 2017 2:38 PM
To: McCree, Victor; Clark, Theresa; Johnson, Michael; Brown, Frederick
Cc: Dickson, Billy
Subject: RE: Re: Comments for the Public Meeting on Backfitting Led by CRGR - ~~OUO~~-
PREDECISIONAL

OK, will do.

Gary

From: McCree, Victor
Sent: Tuesday, April 18, 2017 2:22 PM
To: Clark, Theresa <Theresa.Clark@nrc.gov>; Holahan, Gary <Gary.Holahan@nrc.gov>; Johnson, Michael <Michael.Johnson@nrc.gov>; Brown, Frederick <Frederick.Brown@nrc.gov>
Cc: Dickson, Billy <Billy.Dickson@nrc.gov>
Subject: RE: Re: Comments for the Public Meeting on Backfitting Led by CRGR - ~~OUO~~-
PREDECISIONAL

Ok, got it all, thanks.

[Gary] I support your assessment of items 1, 2 and 3. Please craft an email and I'll send it to Steve West, et al. to convey the suggested views/actions.

Thanks, Vic

From: Clark, Theresa
Sent: Tuesday, April 18, 2017 12:08 PM
To: Holahan, Gary <Gary.Holahan@nrc.gov>; McCree, Victor <Victor.McCree@nrc.gov>; Johnson, Michael <Michael.Johnson@nrc.gov>; Brown, Frederick <Frederick.Brown@nrc.gov>
Cc: Dickson, Billy <Billy.Dickson@nrc.gov>
Subject: RE: Re: Comments for the Public Meeting on Backfitting Led by CRGR - ~~OUO~~-
PREDECISIONAL

One piece of additional information re: #4 below – Anne Boland already forwarded the email string from Mr. Miranda to OIG ((b)(6)) for awareness. She provided a bit of context in the email but did not link to the documents themselves as you mention below. I think that should cover that item for now.

From: Holahan, Gary
Sent: Tuesday, April 18, 2017 11:53 AM
To: McCree, Victor <Victor.McCree@nrc.gov>; Johnson, Michael <Michael.Johnson@nrc.gov>; Brown, Frederick <Frederick.Brown@nrc.gov>
Cc: Dickson, Billy <Billy.Dickson@nrc.gov>; Clark, Theresa <Theresa.Clark@nrc.gov>
Subject: FW: Re: Comments for the Public Meeting on Backfitting Led by CRGR - ~~OUO~~-
PREDECISIONAL

Vic,
Mike,
Fred,

Here is my assessment of, and recommended actions in response to, the e-mails below from former NRC employee Sam Miranda.

(b)(5)

Suggested actions:

(b)(5)

If you agree, I can sent (based on consultation with the EDO), or draft for the EDO, any or all of the above suggested e-mails,

Gary

Holahan, Gary

From: Holahan, Gary
Sent: Tuesday, April 18, 2017 11:53 AM
To: McCree, Victor; Johnson, Michael; Brown, Frederick
Cc: Dickson, Billy; Clark, Theresa
Subject: FW: Re: Comments for the Public Meeting on Backfitting Led by CRGR - ~~OUO~~
~~PREDECISIONAL~~

Vic,
Mike,
Fred,

Here is my assessment of, and recommended actions in response to, the e-mails below from former NRC employee Sam Miranda.

(b)(5)

Suggested actions:

(b)(5)

(b)(5)

If you agree, I can sent (based on consultation with the EDO), or draft for the EDO, any or all of the above suggested e-mails,

Gary

It is necessary for the Petitioner to request the NRC staff to take the following enforcement action with respect to the Byron and Braidwood plants:

- (1) Revoke the Licensee's authorizations to operate its Byron and Braidwood Stations at any uprated power level.
- (2) Impose a license condition, on current operations, requiring the Licensee to provide an acceptable demonstration of compliance with the aforementioned design requirement. See [11] for a precedent.
- (3) Require the Licensee to file a 10 CFR §21 report regarding its statement of *no significant hazards*.

From: Samuel Miranda [mailto:sm0973@gmail.com]

Sent: Monday, April 17, 2017 11:02 AM

To: Cupidon, Les <Les.Cupidon@nrc.gov>

Cc: McCree, Victor <Victor.McCree@nrc.gov>; DiFrancesco, Nicholas <Nicholas.DiFrancesco@nrc.gov>; West, Steven <Steven.West@nrc.gov>; Hackett, Edwin <Edwin.Hackett@nrc.gov>; Weber, Michael <Michael.Weber@nrc.gov>; Boland, Anne <Anne.Boland@nrc.gov>; Dickson, Billy <Billy.Dickson@nrc.gov>; Holahan, Gary <Gary.Holahan@nrc.gov>; Johnson, Michael <Michael.Johnson@nrc.gov>; Clark, Theresa <Theresa.Clark@nrc.gov>; Brown, Frederick <Frederick.Brown@nrc.gov>

Subject: [External_Sender] Re: Comments for the Public Meeting on Backfitting Led by CRGR

I see that K. Steven West, the chairman of the Committee to Review Generic Requirements (CRGR), has issued a summary of its February 28th meeting, regarding the backfitting process (ADAMS Accession No. ML17062A511).

The summary mentions my comments; but not their content. They're buried in ADAMS. To see my comments, one has to consult ADAMS Accession No. ML17073A181. Note that my comments recognize Mr. West's conflict of interest, and call for his recusal. I believe this needs to be addressed before Mr. West can continue as chairman, and certainly before he can write any meeting summaries.

The summary also mentions an ASME paper, on this topic, and misleads readers to the following link: <http://proceedings.asmedigitalcollection.asme.org/data/conferences/asmep/90057/v002t08a004-icone24-60472.pdf>. This link took me to a dead end.

To see this paper, one needs to go to

<http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=2577045>, and purchase a copy from the ASME. (This link is found by Googling "ICONE24-60472".) If you need a copy, I'm sure the NRC Library can obtain one for you.

I also see, in the meeting transcript (ADAMS Accession No. ML17066A461), that there are now "lessons learned" from the "Exelon Backfit Appeal", which is described as a "gold bar" by a representative of one of the participating utilities. However, the specific "lessons learned" are not specified. (There is no need to disclose such things in an echo chamber, since everyone present is informed, and in agreement.)

It seems to me that the CRGR, and the Commission are working to dismantle the Compliance Exception, in the Backfit Rule, all without a Rulemaking. The Compliance Exception is one of the few tools, still available to the NRC staff, to correct errors in its reviews, and in licensees' submittals. The CRGR is doing this by adding further restrictions in the backfit implementation procedures, and the Commission is doing its part by adding a cost consideration requirement for compliance backfits. Cost consideration has always been a part of the Backfit Rule; but only for safety enhancements, not for corrections of errors or omissions. The Supreme Court ruling applies to the EPA's safety enhancements, not to the NRC's restoration of safety margin. Nevertheless, it is being used as a pretext to hobble the Compliance Exception. Cost consideration requirements are very effective, in this respect, since they open NRC orders (including backfit orders) to unending appeals and debates, each supported by cost-benefit evaluations that are tailored to support their creators' "conclusions". I saw this happen during the ATWS controversy. The result was a shoddy compromise (10 CFR 50.62).

If I am wrong, I'm sure one or more of you will correct me.

On Mon, Mar 6, 2017 at 11:07 AM, Cupidon, Les <Les.Cupidon@nrc.gov> wrote:

Mr. Miranda,

Thank you very much for your comments. I will forward your comments to the CRGR for further consideration. Although, the meeting was planned to run from 1-4 PM, the agenda was completed and the meeting concluded shortly after 2:00 PM. For your information, I am providing the link to the NRC webpage where you can find the recording of the February 28, 2017 CRGR public meetings: <https://video.nrc.gov/>.

Please feel free to contact me if you have any further questions or comments regarding any CRGR related activities.

Les Cupidon (301-415-0956)

CRGR Technical Assistant

From: Samuel Miranda [mailto:sm0973@gmail.com]
Sent: Monday, March 06, 2017 10:15 AM
To: DiFrancesco, Nicholas <Nicholas.DiFrancesco@nrc.gov>
Cc: Cupidon, Les <Les.Cupidon@nrc.gov>; McCree, Victor <Victor.McCree@nrc.gov>
Subject: [External_Sender] Comments for the Public Meeting on Backfitting Led by CRGR

Hello Nick,

This is Sam Miranda. I retired in August, 2014. I called into the public meeting of February 28th, shortly after 2 PM, and found no one on the line. I was literally in the air at 1 PM, between DC and Jacksonville. The agenda allowed for public comments between 2:15 and 3:45; but the meeting was apparently already over by the time I landed. I couldn't submit my comments during this lightning meeting, so I am providing them here.

Before I retired, I began a backfit regarding Exelon's Byron and Braidwood units. Jen Whitman guided it to completion, through two years of meetings, revisions, comments, and edits. I couldn't have done it better, myself. There is nothing wrong with that backfit. Exelon appealed the backfit, based upon NUREG-1409, the Backfit Rule's Statement of Considerations, which restrains the NRC staff's implementation of the Rule's compliance exception to situations in which there are identified errors and omissions in the licensee's submittal, or errors in the NRC staff's review and approval. As an NRC employee, and later, as a member of the public, I pointed out more than a dozen serious errors and omissions in the Byron and Braidwood licensing basis. You can see these in ML17010A051. The NRR appeal panel denied Exelon's appeal. (I agree with the NRR appeal panel's decision.)

Exelon appealed again, this time directly to the EDO. The EDO overruled the NRR appeal panel, and granted Exelon's appeal. He then asked Gary Holahan to write a report to document a technical basis for his decision. This 60-page report labored mightily to show that Byron and Braidwood's pressurizer safety valves (PSVs) are qualified for water relief. It failed. At best, the report indicates that the PSVs could (sometimes) reseal, after relieving water: but will leak up to about 200 gpm. This is about equal to the ECCS delivery rate at 2500 psia. (The PSVs are not isolable.) This report also recommends suspension of GDC 21 for the PSVs. Many of these points can be found in a 10CFR2.206 enforcement petition I submitted last November (ML17010A051). Inter alia, ML7010A051 indicates that water qualification of the PSVs has nothing to do, whatsoever, with demonstrating compliance with the design requirement that prohibits an anticipated operational occurrence (AOO) from developing into a more serious event. By the time the PSVs can open, at 2500 psia, the AOO will have already become a more serious event.

Comments:

1. One of the CRGR meeting's NRC participants, Steven West, was also an author of the aforementioned report, which implied that, somehow, the NRC staff incorrectly applied the compliance exception of the backfit rule. Now he is judging the staff's implementation of the backfit rule on a generic basis. This is a conflict of interest! He should recuse himself.

2. As an expert in incident response, Steven West should know, very well, that PSVs are not designed to respond to AOOs. Qualifying the PSVs for water relief is meaningless. This is not evident in the report he authored.

3. I believe that the NRC staff correctly applied the compliance exception of the backfit rule, even according to all the constraints of the Statement of Consideration. The NRC staff does not need any CRGR-defined training. It is the EDO and his staff that need training.

4. Please enter my 10CFR2.206 enforcement petition (ML17010A051) for CRGR review, as a public comment.

FYI, I will be in the office, on March 14th, to discuss my 10CFR2.206 enforcement petition (ML17010A051) with the petition review board.

Sincerely,

Sam Miranda, PE

Holahan, Gary

From: Holahan, Gary
Sent: Tuesday, April 18, 2017 4:44 PM
To: McCree, Victor
Cc: Johnson, Michael; Clark, Theresa; Dickson, Billy; Brown, Frederick
Subject: EDO e-mail to Steve West

Vic,

Below is the suggested e-mail content. You may cut-and-paste the cc. list and the text for your e-mail to:

Steve West

cc. Les Cupidon; Margaret Doane; Bradley Jones; Bill Dean; Joseph McMillan; (b)(6); Anne Boland; Brian McDermott; Scott Moore; Edward Williamson; Leonard Wert

Steve,

(b)(5)

(b)(5)

Holahan, Gary

From: Holahan, Gary
Sent: Tuesday, December 13, 2016 7:42 AM
To: Weber, Michael
Subject: RE: FYI - Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Thanks, Mike.

From: Weber, Michael
Sent: Tuesday, December 13, 2016 7:22 AM
To: Johnson, Michael <Michael.Johnson@nrc.gov>
Cc: Clark, Theresa <Theresa.Clark@nrc.gov>; Holahan, Gary <Gary.Holahan@nrc.gov>; Lewis, Robert <Robert.Lewis@nrc.gov>; Rasouli, Houman <Houman.Rasouli@nrc.gov>
Subject: FYI - Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Good morning, Mike. NRR requested Mike Case to chair the Petition Review Board for the Miranda §2.206 petition on the Byron/Braidwood backfit issue. Sharing for awareness.

From: Kim, James
Sent: Monday, December 12, 2016 12:45 PM
To: Case, Michael <Michael.Case@nrc.gov>
Cc: Banic, Merrilee <Merrilee.Banic@nrc.gov>
Subject: FW: Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Mr. Case,

We are currently in a process of assembling a Petition Review Board (PRB) for the attached 2.206 petition and you have been recommended to be a PRB chair. If you are agreeable to be a PRB chair, we will proceed with offering a meeting or teleconference with the petitioner to provide any relevant additional explanation and support for the request in advance of the PRB's evaluation.

Than you.

Jim Kim
NRR/DORL
2.206 Petition Coordinator Backup
301-415-4125

From: Broaddus, Doug
Sent: Monday, December 12, 2016 11:53 AM
To: Banic, Merrilee <Merrilee.Banic@nrc.gov>; Kim, James <James.Kim@nrc.gov>
Cc: Wiebe, Joel <Joel.Wiebe@nrc.gov>
Subject: FW: Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Jim,

See response below from Anne. Per Bill Dean, the PRB chair will need to be selected from outside NRR. Anne indicated that she spoke to Michael Case (Division Dir in RES), and he is willing to take on the PRB chair responsibility. Given this, please contact him to get him assigned as the PRB Chair for this

petition. If you need help with that process, please contact Tanya Mensah, as Lee did not yet describe to me what mechanism is used to assign the PRB chair (memo, email, and from what level).

Also work with Joel to identify the other PRB members. Although Bill supports NRR staff participating in the PRB, Anne and I recommend that there also be a level of independence for the technical review of these issues. It may be difficult to find a qualified NRR reviewer that has not been involved in this issue. As such, please recommend non-NRR staff qualified to review the issues as potential candidates to serve on the PRB. For example, someone from NRO or RES may be able to serve in this capacity (although, I understand that some RES staff may have already been involved in the backfit process). Once you and Joel have the recommendations, we can discuss them with Mike. Note that this does not preclude involvement by NRR technical staff, it is just an additional measure to further provide independence for the PRB. As such, you should also recommend DSS reviewers that could serve on the PRB.

The PRB Chair and technical staff participants should be identified by the end of this week.

Has the extension request gone up yet? If so, what was the requested due date?

Let me know if you have any questions or comments on the above.

Doug

From: Boland, Anne
Sent: Thursday, December 08, 2016 3:54 PM
To: Broaddus, Doug <Doug.Broaddus@nrc.gov>
Cc: Wilson, George <George.Wilson@nrc.gov>; Benner, Eric <Eric.Benner@nrc.gov>
Subject: RE: Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Doug –

I discussed with Bill the planned approach for DORL to Chair the PRB. He indicated that, while he supports NRR participation on the Board, he desired that the chair be from outside NRR. He did not think we needed to go to the level of an OD or Deputy OD. He was think Division level. He mentioned Brian Thomas. A couple of other names have also surfaced such as Mike Case or Mike Cheek. Open to other ideas.

He was supportive of the thought process on the extension.

We will catch up on this on Monday morning.

Anne

From: Broaddus, Doug
Sent: Wednesday, December 07, 2016 7:29 PM
To: Boland, Anne <Anne.Boland@nrc.gov>
Cc: Kim, James <James.Kim@nrc.gov>; Banic, Merrilee <Merrilee.Banic@nrc.gov>; Wilson, George <George.Wilson@nrc.gov>; Wiebe, Joel <Joel.Wiebe@nrc.gov>
Subject: Recommendations for Byron/Braidwood 2.206 petition (Miranda petition)

Anne,

Jim Kim (backing up Lee Banic) and I met with Sara Kirkwood (OGC), Teresa Clark (ETA), and Joel Wiebe (PM) to discuss the path forward for the Miranda 2.206 petition. Below are the outcomes and recommendations from the meeting:

- There is no requirement to screen PRB participants for a Conflict of Interest in MD 8.11 and §2.206. In addition, there is no "independence" requirement that prohibits participating in the PRB if you were involved in issues or decisions identified in a 2.206 petition. In many cases, having individuals who were involved in the issue or decision is beneficial.

RECOMMENDATION: There are no conflict of interest or independence concerns that would suggest that you cannot serve as the PRB chair.

- There is no requirement in MD 8.11 that a PRB chair be from the office to which the action is assigned.

RECOMMENDATION: Requesting an alternative PRB chair outside NRR is only recommended if the NRR OD feels that independence from the prior decision-making process is desirable (although not required). As some prior awareness and understanding of the technical and regulatory issues addressed in the 2.206 petition would be beneficial, we discussed potential candidates like Steve West (he was on the Backfit Appeal Review Panel) and Scott Flanders (as the incoming NRR/DSS Director, he will be responsible for the technical review areas addressed in the petition). Ed Hackett could also be an appropriate alternative.

(b)(5)

We also discussed the need to request an extension to the due date for issuing the acknowledgement letter (due 12/22/16). Teresa Clark recommended requesting an extension that is after the due date of the 120 day plan (January 16th), so that the PRB could consider that information prior to making its decision whether to accept the petition. We recommend requesting at least a 60 day extension to the current due date. More than 60 days may be needed to allow the PRB to fully consider information from the staff's 120 day plan.

I hope this addresses any concerns or questions you have on the Miranda 2.206 petition. If you have any additional questions, please contact myself or Jim Kim (backup 2.206 coordinator while Lee Banic is out).

Doug

From: PMDA [<mailto:SVCportaladmin@nrc.gov>]
Sent: Wednesday, November 23, 2016 10:10 AM
To: RidsNrrDorl Resource <RidsNrrDorl.Resource@nrc.gov>; Cox, Linda <Linda.Cox@nrc.gov>; Orf, Tracy <Tracy.Orf@nrc.gov>
Cc: Walker, Sandra <Sandra.WalkerNRR@nrc.gov>
Subject: ACTION: EDO Action Item Assignment for DORL

Ticket No.: [OEDO-16-00783](#)

Assigned To: DORL

Subject: 2.206 - Enforcement Petition Regarding Exelon's Byron and Braidwood Stations

Due Date: 12/22/2016
NRR Due Date: 12/15/2016

(1) Acknowledgement - 30 days from assignment. (2) Proposed Final Director's Decision - 120 days from date of Acknowledgement Letter. (3) Final Director's Decision - 45 days from the end of the Comment Period.

Submit a request to [close this ticket](#).

Holahan, Gary

From: Holahan, Gary
Sent: Wednesday, April 26, 2017 9:47 AM
To: Clark, Theresa
Subject: RE: Comments Requested: Draft B/B Backfitting Slides for Regional Presentations

Theresa,

Thanks for sharing.

(b)(5)

Let's discuss...

Gary

From: Clark, Theresa
Sent: Wednesday, April 26, 2017 8:26 AM
To: Holahan, Gary <Gary.Holahan@nrc.gov>
Subject: Fwd: Comments Requested: Draft B/B Backfitting Slides for Regional Presentations

From: "Garmoe, Alex" <Alex.Garmoe@nrc.gov>
Subject: Comments Requested: Draft B/B Backfitting Slides for Regional Presentations
Date: 25 April 2017 17:22
To: "Clark, Theresa" <Theresa.Clark@nrc.gov>
Cc: "Stuchell, Sheldon" <Sheldon.Stuchell@nrc.gov>, "Benowitz, Howard" <Howard.Benowitz@nrc.gov>
Theresa,

As part of the staff's effort to update agency backfitting guidance, in coordination with the development of CRGR's response to the EDO tasking, Howard Benowitz and I have been developing a presentation on backfitting for the upcoming regional inspector counterpart meetings. As part of the discussion on recent backfitting events we included a couple slides on the Braidwood/Byron backfit appeal. We shared our draft slides with CRGR to ensure alignment, and Steve West recommended we show you the B/B backfit slides to ensure the EDO panel's effort and conclusions are properly characterized. I have attached two files – one file is only the two slides on B/B backfit and the other file is the latest draft of the entire presentation (B/B is discussed on slides 16 and 17). If it would not be too much trouble, we would appreciate your agreement with the B/B backfit content or your comments on any mischaracterizations.

Please note that the presentation has not yet been reviewed and approved by OGC management. We are currently on the agenda for Region I on May 9, Region II on June 6, and Region III on June 13. We were unable to get time in Region IV this spring and hope that there will be space at the December counterpart meeting.

Thank you,



Alexander D. Garmoe

Senior Project Manager

Generic Communications Branch (PGCB)

Division of Policy and Rulemaking (DPR)

Office of Nuclear Reactor Regulation (NRR)

Alex.Garmoe@nrc.gov | 301-415-3814

Holahan, Gary

From: McCree, Victor
Sent: Monday, August 14, 2017 9:08 AM
To: McIntyre, David
Cc: Castelveter, David; Mitlyng, Viktoria; Holahan, Gary; Lewis, Robert; Brown, Frederick; Johnson, Michael
Subject: Re: OPA responses to BGA questions

Perfect! I support this approach.

Thanks, Vic

On: 14 August 2017 08:42, "McIntyre, David" <David.McIntyre@nrc.gov> wrote:

Hi Vic – Dave C asked me to brief you on our strategy for responding to all those questions from the Better Government Association. He has asked me to ride point in compiling responses to the various subject areas that are essentially Headquarters questions (most of the latest round of questions). So I have binned the questions into several groups and am working with various offices (mostly NRR) to develop responses. Gary Holohan has graciously agreed to review them for OEDO before we send them. We hope to start sending some of the responses early this week. Vika Mitlyng is working on the questions specific to Region 3 and will continue to be our contact person with BGA, relaying the responses as they are developed.

(b)(5)

Dave

David McIntyre
Public Affairs Officer
U.S. Nuclear Regulatory Commission
(301) 415-8200 (office)
(301) 415-8206 (direct)
Protecting People & the Environment

Holahan, Gary

From: Holahan, Gary
Sent: Wednesday, August 09, 2017 4:55 PM
To: McIntyre, David
Cc: Clark, Theresa
Subject: Questions on backfit
Attachments: Backfit questions from OPA 2017 08 09 .docx

Dave,

Here is my instant analysis ... headlines count... and suggested changes to the propose response.

Please let me know if the comments are helpful or if you wish to discuss,

Gary

(b)(5)



(b)(5)

(b)(5)

(b)(5)

JOSEPH E. POLLOCK
*Vice President, Nuclear Operations
and Interim Chief Nuclear Officer*

1201 F Street, NW, Suite 1100
Washington, DC 20004
P: 202.739.8114
jep@nei.org
nei.org



June 6, 2017

Mr. Victor M. McCree
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Subject: Clarification of Issues Related to Compliance with General Design Criteria and Conformance to Licensing Basis Documents

Project Number: 689

Dear Mr. McCree:

I am writing on behalf of the Nuclear Energy Institute (NEI)¹ and the commercial nuclear power industry to emphasize the importance of applying the recent guidance provided by the Solicitor/Office of the General Counsel² in analyzing questions of compliance with the General Design Criteria (GDC) and licensing basis documents.³ Proper application of this guidance will be important to the resolution of several issues that are currently being addressed by the NRC staff and the industry, including tornado missile protection and the service life of certain structures, systems and components.

The role of the GDC as part of a plant's licensing basis is a foundational issue that affects many aspects of the NRC's regulatory programs, including licensing actions, requests for

¹ NEI is responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including regulatory, financial, technical and legislative issues. NEI members include all companies licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

² Memorandum from A.P. Averbach (Solicitor, NRC) to E.M. Hackett (Chairman, CRGR) "Summary of COMSECY-16-0020 Recommendation on Revision of Guidance Concerning Consideration of Cost and Applicability of Compliance Exception to Backfit Rule," Dec. 20, 2016 ("Solicitor's Memo"). The Solicitor's Memo summarized the guidance provided by the General Counsel in COMSECY-16-0020, which is not publicly available. The Commission approved the recommendations made in COMSECY-16-0020 in a November 29, 2016 staff requirements memorandum.

³ As used in this letter, the term "licensing basis" is intended to include the information covered by the definition of "current licensing basis" provided in 10 CFR 54.3.

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additional information, generic communications, and inspections and enforcement. As well articulated in the Solicitor's Memo, the GDC are not requirements in themselves except in limited circumstances. Instead, they lay the foundation for more specific requirements found elsewhere in the licensing basis. Ambiguity in the GDC or licensing basis is not an opportunity for staff to impose new or changed requirements on licensees. Rather, the Commission has recognized a presumption that a licensed facility is safe to operate and thus meets applicable GDC and licensing basis requirements. For this reason, the staff should base any compliance backfit requests on specific, prescriptive requirements as opposed to high-level standards.

Therefore, we respectfully request that the Office of Nuclear Reactor Regulation provide guidance to the inspection and technical staff to ensure that questions of compliance with the GDC and conformance to a plant's licensing basis are examined through the proper lens. This guidance, discussed below in greater detail, could ultimately be included in the planned update to the agency's backfitting guidance contained in NUREG-1409.

Compliance with GDC

The Solicitor's Memo provided guidance to the NRC staff regarding use of the compliance exception to maintain consistency with the GDC. Although this guidance was provided in the context of implementing the compliance exception to the Commission's backfitting rules, its utility expands beyond the scope of the compliance exception. Specifically, the Solicitor's Memo states (in part):

General Design Criteria (GDCs) represent "minimum requirements" for the principal design criteria (PDCs) for water-cooled nuclear power plants similar in design and location to plants for which construction permits have been issued by the Commission. See 10 C.F.R. Part 50 App. A. Applicants for licenses issued under Part 50 (or Part 52, if they are not relying on already approved design certifications) are required to submit PDCs for approval. The two-step licensing process of Part 50 requires approval of the PDCs as a condition to the grant of a construction permit. Later, prior to issuance of an operating license and as a basis for its finding of reasonable assurance of adequate protection of public health and safety, the Commission must find that the facility has been built in accordance with the PDCs and any changes. See Final Rule, General Design Criteria for Nuclear Power Plants, 36 Fed. Reg. 3255, 3256 (Feb. 20, 1971) ("Principal design criteria established by an applicant and accepted by the Commission will be incorporated by reference in the construction permit. In considering the issuance of an operating license under Part 50, the Commission will require assurance that these criteria have been satisfied in the detailed design and construction of the facility and that any changes in such criteria are justified."). Thus, for Part 50 licenses issued since 1971 (when the GDCs were promulgated), the Commission has already necessarily reached the conclusion that the design basis of the plant, as reflected in the PDCs, meets or exceeds the minimum criteria set forth in the GDCs.

The approval process outlined above will typically yield more specific requirements than those set forth in the GDCs. However, the agency is not precluded from reliance on GDCs as the source of a "requirement" for purposes of invoking the compliance exception, in those cases where a GDC provides more than just a performance standard and has not been superseded through the approval of PDCs and requirements derived from those PDCs. Thus, a GDC can be regarded as a requirement in those circumstances in which the GDC is prescriptive in nature and the technical specifications and other licensee requirements derived from the PDCs do not speak to the matter in question.⁴

As explained in this passage, typically the GDC and PDC are translated into more specific licensing basis requirements against which compliance can be objectively evaluated. Thus, questions of compliance with the GDC should typically be determined by examining the technical specifications and other, more prescriptive licensing basis requirements derived from the PDCs.⁵

This understanding of the specific role of the GDC should also apply to future generic design criteria developed for non-light-water (advanced) reactors. Indeed, in recent draft guidance proposing such design criteria (based off the GDC), the staff acknowledged that the proposed design criteria "are not considered to be final or binding."⁶ Instead, "[i]t is the applicant's responsibility to develop the PDC for its facility based on the specifics of its unique design, using the GDC, non-LWR design criteria, or other design criteria as the foundation."⁷

In addition, the Commission has concluded that the GDC should not be retroactively applied to plants that received their construction permits prior to May 21, 1971.⁸ After considering the question of whether the agency should backfit the GDC, the Commission concluded:

⁴ Solicitor's Memo, at pg. 3-4 (emphasis added). While we generally agree with this guidance, it is unclear that any of the GDC is sufficiently "prescriptive in nature" to serve as a basis for objectively evaluating compliance at facilities that have been operating for decades.

⁵ NEI made a similar point in its July 19, 2016, letter to the Executive Director for Operations. See Letter from A.R. Pietrangelo (NEI) to V.M. McCree (NRC), "Nuclear Energy Institute Comments on Tasking Memorandum Dated June 9, 2016" (July 19, 2016). This position is also consistent with the guidance provided in the NRC's Enforcement Manual. See "Nuclear Regulatory Commission Enforcement Manual," Rev. 10 (March 3, 2017), at pg. 347 (explaining that the GDC carryover into the requirements for the FSAR and the Technical Specifications, and that the GDC are not directly applicable to operating requirements).

⁶ DG-1330, *Guidance for Developing Principal Design Criteria for Non-Light Water Reactors*, at 7 (Feb. 2017).

⁷ *Id.*

⁸ Memorandum from S.J. Chilk (Secretary, NRC) to J.M. Taylor (Executive Director for Operations, NRC), "SECY-92-223 – Resolution of Deviations Identified During the Systematic Evaluation Program," Sept. 18, 1992.

At the time of promulgation of Appendix A to 10 CFR Part 50, the Commission stressed that the GDC were not new requirements and were promulgated to more clearly articulate the licensing requirements and practice in effect at that time. While compliance with the intent of the GDC is important, each plant licensed before the GDC were formally adopted was evaluated on a plant specific basis, determined to be safe, and licensed by the Commission. Furthermore, current regulatory processes are sufficient to ensure that plants continue to be safe and comply with the intent of the GDC. Backfitting the GDC would provide little or no safety benefit while requiring an extensive commitment of resources. Plants with construction permits issued prior to May 21, 1971 do not need exemptions from the GDC.⁹

Given the discussion provided above, guidance should be provided to the inspection and technical staff, which clarifies the following: (1) for Part 50 licenses issued since 1971, the Commission has already necessarily reached the conclusion that the design basis of the plant, as reflected in the PDCs and confirmed by comparison to the as-built configuration of the plant, meets or exceeds the minimum criteria set forth in the GDCs; (2) the Commission has already decided that backfitting the GDC on plants with construction permits issued prior to May 21, 1971, is unnecessary because those plants were designed to criteria that are substantially similar to the GDC; and (3) when evaluating compliance with the GDC, inspectors and technical staff should identify relevant technical specifications and other more prescriptive NRC requirements, contained in either the regulations or the facility's licensing basis, in order to evaluate compliance.

Compliance with Licensing Basis Documents

The inspection and technical staff should also be provided guidance on how to analyze compliance with licensing basis information contained in the Updated Final Safety Analysis Report (UFSAR). Specifically, the staff should focus on identifying prescriptive licensing basis requirements that can be objectively evaluated, without the need for significant reinterpretation and without imposing current guidance or positions on licensees that were not applicable when licensing decisions were made, and which the licensee has not formally committed to meeting.

In situations where the relevant licensing or design basis requirements are not prescriptive enough for the staff to objectively evaluate compliance (*i.e.*, the relevant requirements are susceptible to multiple reasonable interpretations, at least one of which would allow the inspector or reviewer to conclude that the licensee's method of compliance is adequate), the

⁹ *Id.* at pg. 1.

presumption should be that the as-built condition of the plant conforms to the applicable GDC and licensing basis. As explained above in the discussion of GDC compliance, prior to issuance of an operating license the Commission has already necessarily concluded that the "facility has been built in accordance with the PDCs."¹⁰ This aligns with the Commission's statement in its 1985 backfitting rule that there is a "presumption of safety which ordinarily accompanies the issuance of a license."¹¹ This presumption is also consistent with the guidance provided in NUREG-1409 with respect to the "reanalysis of issues," which states:

Throughout plant lifetime, many individuals on the NRC staff have an opportunity to review the requirements and commitments incumbent upon a licensee. Undoubtedly, there will be occasions when a reviewer concludes the licensee's program in a specific area does not satisfy a regulation, license condition or commitment. In the case where the staff previously accepted the licensee's program as adequate, any staff specified change in the program would be classified as a backfit.

For example, in the case of an NTOL, once the SER is issued signifying staff acceptance of the programs described in the SAR, the licensee should be able to conclude that his commitments in the SAR satisfy the NRC requirements for a particular area. If the staff was to subsequently require that the licensee commit to additional action other than that specified in the SAR for the particular area, such action would constitute a backfit.¹²

Just as a licensee is entitled to rely on the NRC's review and approval of programs (and the sufficiency of the commitments upon which such approvals are based), licensees should likewise be able to rely on the Commission's conclusion that the facility has been built in accordance with the PDCs. This presumption stems from the fact that nuclear power plants are designed and licensed as an integrated system, and a patchwork reinterpretation of the GDC to force-fit individual changes on a licensed facility could be harmful if done "without the benefit of integrating the impact of these changes across the whole system or plant."¹³

The presumption discussed above would not, however, prevent the staff from correcting situations where the as-built condition of the plant clearly does not conform to a prescriptive licensing basis requirement, or from imposing a new or different interpretation of the licensing

¹⁰ Solicitor's Memo, at pg. 3.

¹¹ *Revision of Backfitting Process for Power Reactors, Final Rule*, 50 Fed. Reg. 38,097 (Sept. 20, 1985), *vacated and remanded on other grounds sub nom., Union of Concerned Scientists v. U.S. Nuclear Regulatory Comm'n*, 824 F.2d 108 (D.C. Cir. 1987).

¹² "Backfitting Guidelines," NUREG-1409 (July, 1990), at pg. 18-19.

¹³ REGULATORY REFORM TASK FORCE, U.S. NUCLEAR REGULATORY COMMISSION, REPORT ON BACKFITTING AND LICENSING PRACTICES AT THE U.S. NUCLEAR REGULATORY COMMISSION 6 (March 11, 1985).

or design basis in all circumstances.¹⁴ Specifically, the agency's backfitting rules should be used to determine whether this presumption can be overcome. With respect to use of the compliance exception, the staff should follow the direction provided in the Solicitor's Memo to determine whether use of the exception is appropriate. For example, when evaluating a new or different position regarding a plant's licensing basis, the compliance exception would not be applicable to:

recharacterizations of whether a particular set of otherwise understood circumstances satisfies the standard at issue [*e.g.*, a licensing basis requirement] based upon professional standards and practices developed or accepted after the time of the determination [*e.g.*, the NRC's original licensing decision or subsequent NRC approvals].¹⁵

Assuming a potential backfit does not raise adequate protection considerations, in cases where the compliance exception is not applicable a full backfitting analysis should be performed prior to imposition of the new or different interpretation on the licensee.

We appreciate your consideration of our views on this issue and understand that work is underway to revise the agency's backfitting guidance in NUREG-1409 to conform to the positions provided in the Solicitor's Memo. We support that effort and look forward to providing industry's views at the appropriate time. We believe, however, that additional guidance (as described above) should be provided for the staff's use while work on NUREG-1409 is underway. Such guidance will ensure that the insights provided in the Solicitor's Memo are brought to bear in resolving important regulatory issues in the near term, and that lessons-learned from the 2016 Exelon backfitting appeal adequately institutionalized and implemented by the agency.

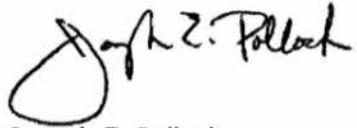
Please feel free to contact me if you have any questions.

¹⁴ In addition, while the presumption discussed above would be relevant when examining compliance with ambiguous licensing basis requirements or commitments, it would not apply in other circumstances, such as when evaluating whether the licensee has appropriately controlled modifications to the design of the facility or modifications to programs described in the USFAR. Instead, such modifications would be evaluated against configuration management, change control, and other relevant requirements.

¹⁵ Solicitor's Memo, at pg. 3.

Victor M. McCree
June 6, 2017
Page 7

Sincerely,

A handwritten signature in black ink that reads "Joseph E. Pollock". The signature is written in a cursive style with a large, stylized initial "J" and "P".

Joseph E. Pollock

c: Commissioners
M.R. Johnson, NRC, OEDO
F.D. Brown, NRC, OEDO
W.M. Dean, NRC, NRR
M.L. Dapas, NRC, NMSS

Holahan, Gary

From: McCree, Victor
Sent: Monday, March 06, 2017 10:20 AM
To: Holahan, Gary; West, Steven; Johnson, Michael; Brown, Frederick
Subject: FW: Comments for the Public Meeting on Backfitting Led by CRGR

See below...forwarded for information only.

Vic

From: Samuel Miranda [mailto:sm0973@gmail.com]
Sent: Monday, March 06, 2017 10:15 AM
To: Difrancesco, Nicholas <Nicholas.DiFrancesco@nrc.gov>
Cc: Cupidon, Les <Les.Cupidon@nrc.gov>; McCree, Victor <Victor.McCree@nrc.gov>
Subject: [External_Sender] Comments for the Public Meeting on Backfitting Led by CRGR

Hello Nick,

This is Sam Miranda. I retired in August, 2014. I called into the public meeting of February 28th, shortly after 2 PM, and found no one on the line. I was literally in the air at 1 PM, between DC and Jacksonville. The agenda allowed for public comments between 2:15 and 3:45; but the meeting was apparently already over by the time I landed. I couldn't submit my comments during this lightning meeting, so I am providing them here.

Before I retired, I began a backfit regarding Exelon's Byron and Braidwood units. Jen Whitman guided it to completion, through two years of meetings, revisions, comments, and edits. I couldn't have done it better, myself. There is nothing wrong with that backfit. Exelon appealed the backfit, based upon NUREG-1409, the Backfit Rule's Statement of Considerations, which restrains the NRC staff's implementation of the Rule's compliance exception to situations in which there are identified errors and omissions in the licensee's submittal, or errors in the NRC staff's review and approval. As an NRC employee, and later, as a member of the public, I pointed out more than a dozen serious errors and omissions in the Byron and Braidwood licensing basis. You can see these in ML17010A051. The NRR appeal panel denied Exelon's appeal. (I agree with the NRR appeal panel's decision.)

Exelon appealed again, this time directly to the EDO. The EDO overruled the NRR appeal panel, and granted Exelon's appeal. He then asked Gary Holahan to write a report to document a technical basis for his decision. This 60-page report labored mightily to show that Byron and Braidwood's pressurizer safety valves (PSVs) are qualified for water relief. It failed. At best, the report indicates that the PSVs could (sometimes) reseal, after relieving water: but will leak up to about 200 gpm. This is about equal to the ECCS delivery rate at 2500 psia. (The PSVs are not isolable.) This report also recommends suspension of GDC 21 for the PSVs. Many of these points can be found in a 10CFR2.206 enforcement petition I submitted last November (ML17010A051). Inter alia, ML7010A051 indicates that water qualification of the PSVs has nothing to do, whatsoever, with demonstrating compliance with the design requirement that prohibits an anticipated operational occurrence (AOO) from developing into a more serious event. By the time the PSVs can open, at 2500 psia, the AOO will have already become a more serious event.

Comments:

1. One of the CRGR meeting's NRC participants, Steven West, was also an author of the

aforementioned report, which implied that, somehow, the NRC staff incorrectly applied the compliance exception of the backfit rule. Now he is judging the staff's implementation of the backfit rule on a generic basis. This is a conflict of interest! He should recuse himself.

2. As an expert in incident response, Steven West should know, very well, that PSVs are not designed to respond to AOOs. Qualifying the PSVs for water relief is meaningless. This is not evident in the report he authored.

3. I believe that the NRC staff correctly applied the compliance exception of the backfit rule, even according to all the constraints of the Statement of Consideration. The NRC staff does not need any CRGR-defined training. It is the EDO and his staff that need training.

4. Please enter my 10CFR2.206 enforcement petition (ML17010A051) for CRGR review, as a public comment.

FYI, I will be in the office, on March 14th, to discuss my 10CFR2.206 enforcement petition (ML17010A051) with the petition review board.

Sincerely,

Sam Miranda, PE

Holahan, Gary

From: Cupidon, Les
Sent: Monday, March 06, 2017 11:07 AM
To: 'sm0973@gmail.com'
Cc: McCree, Victor; Difrancesco, Nicholas; West, Steven; Hackett, Edwin; Weber, Michael; Boland, Anne; Dickson, Billy; Holahan, Gary; Johnson, Michael; Clark, Theresa; Brown, Frederick
Subject: RE: Comments for the Public Meeting on Backfitting Led by CRGR

Mr. Miranda,

Thank you very much for your comments. I will forward your comments to the CRGR for further consideration. Although, the meeting was planned to run from 1-4 PM, the agenda was completed and the meeting concluded shortly after 2:00 PM. For your information, I am providing the link to the NRC webpage where you can find the recording of the February 28, 2017 CRGR public meetings: <https://video.nrc.gov/>.

Please feel free to contact me if you have any further questions or comments regarding any CRGR related activities.

Les Cupidon (301-415-0956)
CRGR Technical Assistant

From: Samuel Miranda [mailto:sm0973@gmail.com]
Sent: Monday, March 06, 2017 10:15 AM
To: Difrancesco, Nicholas <Nicholas.DiFrancesco@nrc.gov>
Cc: Cupidon, Les <Les.Cupidon@nrc.gov>; McCree, Victor <Victor.McCree@nrc.gov>
Subject: [External_Sender] Comments for the Public Meeting on Backfitting Led by CRGR

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Exelon appealed again, this time directly to the EDO. The EDO overruled the NRR appeal panel, and granted Exelon's appeal. He then asked Gary Holahan to write a report to document a technical basis for his decision. This 60-page report labored mightily to show that Byron and Braidwood's pressurizer

safety valves (PSVs) are qualified for water relief. It failed. At best, the report indicates that the PSVs could (sometimes) reseal, after relieving water: but will leak up to about 200 gpm. This is about equal to the ECCS delivery rate at 2500 psia. (The PSVs are not isolable.) This report also recommends suspension of GDC 21 for the PSVs. Many of these points can be found in a 10CFR2.206 enforcement petition I submitted last November (ML17010A051). Inter alia, ML7010A051 indicates that water qualification of the PSVs has nothing to do, whatsoever, with demonstrating compliance with the design requirement that prohibits an anticipated operational occurrence (AOO) from developing into a more serious event. By the time the PSVs can open, at 2500 psia, the AOO will have already become a more serious event.

Comments:

1. One of the CRGR meeting's NRC participants, Steven West, was also an author of the aforementioned report, which implied that, somehow, the NRC staff incorrectly applied the compliance exception of the backfit rule. Now he is judging the staff's implementation of the backfit rule on a generic basis. This is a conflict of interest! He should recuse himself.
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FYI, I will be in the office, on March 14th, to discuss my 10CFR2.206 enforcement petition (ML17010A051) with the petition review board.

Sincerely,

Sam Miranda, PE

Holahan, Gary

From: Clark, Theresa
Sent: Monday, July 17, 2017 11:07 AM
To: Holahan, Gary
Subject: FW: The NRC staff's review of Sam Miranda's 10 CFR §2.206 petition of November 15, 2016
Attachments: BB-Petition-Reply.docx

From: Samuel Miranda <sm0973@gmail.com>
Sent: Sunday, July 16, 2017 1:08 PM
To: Vietti-Cook, Annette; CMRSVINICKI Resource
Cc: McCree, Victor; Dean, Bill; Dave Lochbaum; Brett Chase; Banic, Merrilee; Beaton, Robert; Billerbeck, John; joshua.borromeo@nrc.gov; Drzewiecki, Timothy; gladys.figueroa-toledo@nrc.gov; Kirkwood, Sara; Wiebe, Joel; Broaddus, Doug; Bell, Hubert
Subject: [External_Sender] The NRC staff's review of Sam Miranda's 10 CFR §2.206 petition of November 15, 2016

Dear Chairman Svinicki, and NRC Commissioners:

On November 15, 2016, I filed an enforcement petition, pursuant to the terms of 10 CFR §2.206, which identified a dozen errors, and eight omissions in Exelon's Byron and Braidwood licensing bases. (The NRC staff had already approved two power upratings for these plants.) On June 27th, I received an e-mail message with the results of the NRC staff's review, which are formally provided in a letter, dated June 23rd (ML17108A808).

On October 9, 2015, the NRR staff had issued a backfit order concerning some of these same errors. Exelon had appealed the backfit order (December 8, 2015). The NRR staff diligently considered the appeal, and denied it (May 3, 2016). Exelon appealed again, this time directly to the EDO, on June 2, 2016. The EDO readily granted this appeal (September 15, 2016), and based his decision on a report that was issued by a Backfit Appeal Review Panel (BARP; ML16236A208) that he had appointed to provide the necessary technical support (note: "support", not "review").

I maintain that the enforcement petition, was not properly reviewed. It was summarily rejected via 14 references to the BARP's report. In the petition, and in two subsequent meetings, I documented several examples of errors that are common to Exelon's licensing bases and the BARP's report. (They're all available in ADAMS.) In the end, the BARP

report failed to provide the support the EDO had requested, since it's wrong, and irrelevant. However, it was used to reject an enforcement petition that presented several substantive issues; some with potential safety impact.

Furthermore, I call attention to review process, and particularly to the composition of the petition review board (PRB). 10 CFR §2.206(a) directs, *The Executive Director for Operations will refer the request to the Director of the NRC office with responsibility for the subject matter of the request for appropriate action in accordance with paragraph (b) of this section.* I am informed that, in this case, the EDO referred the petition to the Director of NRR. This is appropriate, and consistent with MD 8.11, which states, *Petitions are assigned to the Office of Nuclear Reactor Regulation, the Office of Nuclear Material, Safety and Safeguards, the Office of Enforcement, or the Office of the General Counsel.* However, the chairman of the PRB was selected from the Office of Research. This office, which doesn't have any responsibility for the subject matter, is conspicuously absent from the list of eligible organizations. I objected to this appointment, and no corrective action was taken.

The closure letter, *per se*, is signed only by this ineligible chairman. It is not signed, or even approved by the Director of NRR. Therefore, I believe that this letter lacks the authority to close the PRB's review. The numerous errors, in the review (see the attachment), require the review to be performed *de novo*, with a new PRB, and new chairman. The new review cannot rely upon the BARP's report to dismiss any issues that predate, by decades, the BARP's recent review.

10 CFR §2.206(c)(1) states, *Director's decisions under this section will be filed with the Office of the Secretary. Within twenty-five (25) days after the date of the Director's decision under this section that no proceeding will be instituted or other action taken in whole or in part, the Commission may on its own motion review that decision, in whole or in part, to determine if the Director has abused his discretion.* I don't know if the Director's decision has yet been filed with the Office of the Secretary, or even if a decision has been taken. However, I do know that this e-mail message will arrive within the twenty-five (25) day interval allowed for the Commission to consider performing its own review.

I hereby request the Commission to look into the NRC staff's handling of this enforcement petition, and also into the EDO's backfit decision that was used to summarily reject it.

Please see the attachment for details. I will try to answer any and all questions that arise during the review, if the Commission chooses to undertake it.

Sincerely,

Samuel Miranda, PE

Attachment –

The NRC staff's review of Sam Miranda's 10 CFR §2.206 petition of November 15, 2016:

The PRB has not performed the thorough, unbiased evaluation that is necessary to close its review. The PRB's evaluation [1] of my 10 CFR §2.206 petition [2] fails for the following reasons:

Procedural Problems

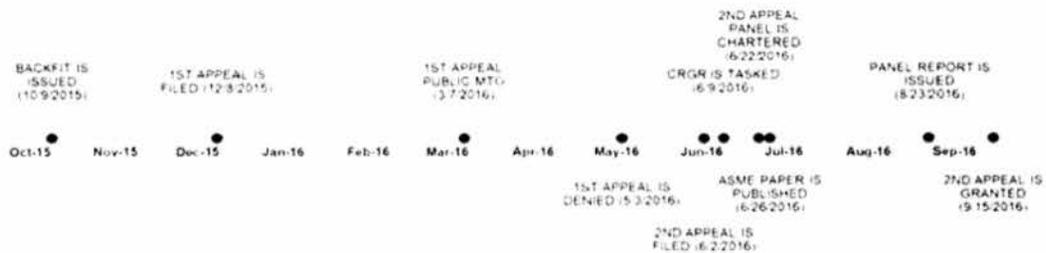
(1) The backfit, and Exelon's backfit appeals

The petition [2] does not mention either of Exelon's backfit appeals. The petition seeks enforcement of current regulations, based upon errors and gaps in the Byron and Braidwood licensing bases that predate, by decades, the NRC staff's backfit, Exelon's backfit appeals, and the EDO's backfit appeal decision. The petition does not contest the EDO's backfit appeal decision. I made this point, clearly, in my meetings with the PRB.

Yet the PRB's evaluation, in its *Basis for not accepting the petition*, invokes the report of the Backfit Appeal Review Panel (BARP) 14 times! If the petition truly lacks any *new significant information*, then the PRB should be able to develop a *basis for not accepting the petition* without resorting to the recent BARP report.

(2) The Backfit Appeal Review Panel (BARP)

The BARP's purpose is stated on page 2 of its report [5]. It is to, *provide information and recommendations to support the EDO's decision on the appeal*. So, the BARP is not really a review panel. It's more of a Backfit Approval & Reversal Panel. This can be seen in the following timeline of events [17].



Note that it took the NRR appeal panel almost five months to consider, and ultimately deny Exelon's first appeal. It took the EDO only one week to issue a tasking memorandum, to the CRGR, to review the *lessons learned* from the backfit appeal, and develop a plan to apply them. Two weeks later, the EDO chartered an appeal panel of five (i.e., the BARP) to *provide information and recommendations* [5] to support his decision to grant Exelon's second appeal. One of the BARP's five panel members was also a member of the CRGR.

Two months later, the BARP issued its report [5]. It applied its *well-informed staff engineering judgment*, to conclude that the PSVs need not be assumed to fail, after having discharged water. Meanwhile, a technical paper was published by the ASME that dealt with some of the same issues the BARP was considering [15]. This paper reached a different conclusion.

Then, in its *basis for not accepting the petition*, the PRB cites the BARP report 14 times!

The timeline also shows that the NRR appeal panel, which was considering Exelon's first appeal, held a public meeting on March 7, 2016. The BARP completed its review without convening a public meeting.

The BARP's decision, based upon *well-informed staff engineering judgment* (read educated guess), was a major change in the way the PSVs are assumed to perform in licensing basis accident analyses. Such a change should be based upon more than just an educated guess. It calls for a rulemaking, or at least a public comment period and meeting. See the petitioner's responses (below) for more information on this.

(3) New significant information

The term, *new significant information*, is used throughout petition evaluation process. MD 8.11's *Criteria for Petition Evaluation* states, *These requests will not be treated as a 2.206 petition unless they present significant new information.* The term is largely undefined. The lack of a connector between *new* and *significant* adds to the term's ambiguity. A comma or semi-colon would indicate that both conditions are required for acceptance. Its absence means that the connector could also be an "OR". Then only one condition would be needed for acceptance. This makes more sense, because (1) it would lead to the acceptance of more petitions (i.e., it would be more conservative, and (2) it's difficult to rule out a new issue as insignificant, without first evaluating it. Several of the petition's issues have been ruled out in this way.

In several cases, the PRB's notion of new or significant does not agree with the petitioner's. For example, the outcome of an IOECCS (and many other AOOs) would be a large amount of water leakage, from three incompletely seated PSVs. The magnitude of the leak, in excess of one million lbs/h, would qualify it as a LOCA. This would be a Condition II LOCA, since it would occur as often as one or more times in a reactor year of operation.

Nevertheless, the PRB concludes that this situation is not significant, since the ECCS will eventually "maintain" the RCS inventory, at low RCS pressures. The PRB effectively transforms the ECCS into a normal makeup system. The PRB also does not distinguish between "maintain" and "overfill". If the ECCS can "maintain" RCS inventory, then there would be no need to analyze LOCAs, and distinguish them from leaks. All LOCAs would be leaks. Perhaps 10 CFR §50.46 could be eliminated. This is further discussed in the petitioner's responses.

The term, "significant" can be highly subjective. However, there is a relatively objective standard available in 10 CFR §50.92. The *no significant hazards statement*, prepared in response to the questions posed in 10 CFR §50.92 provides a binary test for significance. The petitioner's responses identify several significant issues in Exelon's proposed routine use of PSVs to mitigate AOOs. These issues lead to affirmative responses to all three questions.

(4) The applicability of the closure letter [1]

My meeting with the PRB, on March 15th [12], was directed by Mike Case, acting as chairman of the PRB. I objected to his participation in the PRB, and supported my objection by reading out the following text from MD 8.11: *Petitions are assigned to the Office of Nuclear Reactor Regulation, the Office of Nuclear Material, Safety and Safeguards, the Office of Enforcement, or the Office of the General Counsel. Mr. Case is not an employee of any of the listed offices.*

Here is an excerpt from the transcript:

MR. MIRANDA: Therefore, most of the actions described in this directive, and the associated handbook, apply only to those offices. So my question to you, Mr. Case, is, why are you here?

MR. CASE: So I'm here (at the recommendation of Mr. Dean), and it's Mr. Dean who responds. So we are fully compliant with the goals and responsibilities defined in the management directive. So really, when we respond, it'll be Bill Dean that responds, not me.

MR. MIRANDA: I will request for the record that you put that in your response -- for an explanation as to why you're finding that.

MR. CASE: Okay.

The closure letter [1] is signed solely by Michael Case, as Director of the Division of Systems Analysis, in the Office of Nuclear Regulatory Research. It does not contain (1) the explanation that Mr. Case agreed to supply, or (2) Mr. Dean's signature or mark of approval. The letter does not outline any link of authority or delegation from the EDO to Mike Case. Without this sort of provenance, I don't see how Mike Case could have a legitimate reason to serve on this or any PRB.

Therefore, since the PRB review did not meet the subject MD 8.11 requirements, this letter [1] cannot be used to close the review. The review needs to be performed *de novo*, with a new PRB, headed by a new, eligible chairman. It needs to be conducted as an enforcement action, to deal with current, longstanding issues. There is no justification to cite a largely unreviewed, irrelevant, and wrong, report to dismiss issues that could be safety significant.

Technical Problems

At my meeting with the PRB, on March 15th [12], I stated, *So my reasoning here is that in order to reject -- in order to reject a petition like this, which has at least 12 errors, and probably as many omissions, most of which are new, to reject a petition like this, if you are truly concerned with protecting the public health and safety, you would need to verify that each and every one of them has been considered before, and has been resolved. If there's even one that has not been considered or resolved, you need to consider the Petition.*

The PRB did not properly review all the issues of the petition. Instead, it resorted to BARP's report, as a definitive resolution of some issues, as if the BARP's opinion is accepted as some sort of received wisdom. This is just an educated guess that's now been embedded into NRC methods without a proper review or even a public hearing.

The BARP report, 59 pages long, attempts to support the EDO's decision by assembling every bit of extant information that relates, even remotely, to the qualification of PSVs for water relief. This includes 97 references, very few of which are actually cited in the body of the report. One of those uncited references records the petitioner's non-concurrence of Exelon's LAR for a power uprating in 2013 [18]. This was the beginning of the backfit process.

In the end, the sought after qualification, according to ASME standards, cannot be found, so the authors rely upon their *well-informed staff engineering judgment*, to declare that the PSVs' water qualification is close enough, and then conclude that the PSVs need not be assumed to fail. The BARP report does not deal with the fact that qualification of the PSVs for water relief duty is not sufficient to demonstrate compliance with the non-escalation design requirement, and therefore, it's not relevant. The BARP fails to supply the justification the EDO requested.

In any case, the EDO accepts the BARP's pronouncement of the PSVs' qualification, and uses it to rule that GDC 15, *Reactor coolant system design*, GDC 21, *Protection system reliability and testability*, GDC 29, *Protection against anticipated operational occurrences*, and Paragraph (b) of 10 CFR 50.34, *Contents of applications; technical information* do not apply to Exelon's Byron and Braidwood plants. The BARP's "qualification" of the PSVs for water relief is implemented without a rulemaking, or even a public meeting. A rulemaking, or a public meeting, or another form of review would have been useful, since the BARP report is full of mistakes, half-truths, revisions, false comparisons, fabrications, sophism, and even circular arguments. Many of these have been incorporated into the PRB's evaluations. They're identified, issue-by-issue, in the Petitioner's comments (below).

The PRB's evaluation of this petition fails to address any of its issues.

The following is an unedited copy of the PRB's issue evaluations, and conclusions. Each issue is followed by the petitioner's response.

1. Issue:

The licensee's unnecessary overpressure analysis reveals a lack of understanding of the inadvertent operation of the emergency core cooling system (IOECCS). {Error 1}

Discussion:

There is an acceptance criteria for overpressure contained in NUREG-0800, Standard Review Plan (SRP), 15.5.1, "Inadvertent Operation of ECCS [emergency core cooling system]," Revision 1, Section II, "Acceptance Criteria" which cites general design criteria (GDC) 15, as it relates to the reactor coolant system (RCS) being designed to assure that the pressure boundary will not be breached during anticipated operational occurrences (AOOs). The NRC staff in its safety evaluation (SE) dated May 4, 2001, related to the Braidwood/Byron uprate, acknowledged that the acceptance criteria included ensuring that the peak RCS pressure remain less than the safety limit of 110 percent of design and the licensee demonstrated that it met the criteria through use of an analysis.

The staff considers performance of an analysis an acceptable means of demonstrating compliance with acceptance criteria and does not consider it to be indicative of licensee misunderstanding of the IOECCS event.

Conclusion:

Not significant new information.

Petitioner's response:

The issue is the licensee's lack of understanding, not the licensee's demonstration of compliance with GDC 15, with respect to RCS pressure boundary, and its integrity during AOOs.

The petition [2] clearly states, *The RCS pressure will eventually plateau at the ECCS charging pumps' shutoff head. Therefore, it is not necessary to rely upon the PSVs for the IOECCS event to demonstrate compliance with the overpressure requirement. It is also not necessary to perform an overpressure analysis of the IOECCS.*

The licensee could have spent fifteen minutes to write a two-sentence statement to that effect. Instead the licensee devoted more than a week of analysis, documentation, verification, quality assurance, and report writing to produce the same result.

The NRC staff had four opportunities to question the licensee's choice [2] [3] [4] [5], and failed to do so. This is not new information. It's been discussed (internally, re many plants) for decades; but never evaluated. Consequently, its significance is not known.

However, it is significant that the NRC staff diverts the question from comprehension to compliance, and then invokes a "not my job" excuse to dismiss the issue.

2. Issue:

The licensee's unnecessary departure from nuclear boiling rate (DNBR) analysis reveals a lack of understanding of the IOECCS. (Error 2)

Discussion:

There is an acceptance criteria contained in NUREG-0800, SRP, 15.5.1. "Inadvertent Operation of ECCS," Revision 1, Section II, "Acceptance Criteria" which cites GDC 26, as it relates to the reliable control of reactivity changes to assure that specified acceptable fuel design limits are not exceeded, including AOOs. The NRC staff in its SE dated May 4, 2001, related to the Braidwood/Byron uprate, acknowledged that the licensee included a DNB analysis in its application for uprate dated July 5, 2000 (ADAMS Accession No. ML003730536), and demonstrated that the calculated DNBR remains greater than the safety limit. The staff considers performance of an analysis an acceptable means of demonstrating compliance with acceptance criteria and does not consider it to be indicative of licensee misunderstanding of the IOECCS event.

Conclusion:

Not significant new information

Petitioner's response:

Again, the issue is the licensee's lack of understanding, not the licensee's demonstration of compliance with GDC 26, with respect to fuel design limits.

The petition [2] clearly states, *DNB is not a concern for the IOECCS. The ECCS sequence begins with an immediate reactor trip. So, it is not possible to enter a DNB condition when no power is being generated. A DNB analysis is not necessary. This is verified by the results of the Licensee's DNB case analysis, which states, "the minimum DNBR was obtained at time zero for both units."*

It is significant that the calculated DNBR never drops below its nominal value. The staff didn't ask the licensee to explain this unusual result. It indicates the licensee's analysis was not relevant to this AOO or its potential to cause any damage to fuel cladding.

The licensee could have spent fifteen minutes to write a two-sentence statement. Instead the licensee devoted more than a week of analysis, documentation, verification, quality assurance, and report writing to produce the same result.

The NRC staff had four opportunities to question the licensee's choice [2] [3] [4] [5], and failed to do so. The petitioner's concerns, in Error 1 (above), also apply to Error 2.

3. Issue:

The licensing basis (Exelon letter dated July 5, 2000, nor the updated final safety analysis report (UFSAR), Revision 15 (ADAMS Accession No. ML14363A393)) does not provide an analysis or evaluation to demonstrate that the non-escalation requirement is satisfied. {Omission 1}

Discussion:

The licensee did address the non-escalation criteria for the IOECCS event. Exelon's July 5, 2000, letter states in Section 6.2.20.2 that the criteria for Condition II events include not generating a more serious plant condition.

In response to a request for additional information, Exelon, in a letter dated January 31, 2001 (ADAMS Accession No. ML010330145), states that the Electric Power Research Institute (EPRI) testing showing that ability of pressurizer safety valves to reseal following liquid discharge supports the conclusion that the inadvertent SI event would not transition to a higher condition event and provided supporting information.

The NRC staff concluded in its May 4, 2001, SE, that the licensee's crediting of the pressurizer safety valves (PSVs) to discharge liquid water during the spurious SI event to be acceptable.

In addition, the Updated Final Safety Analysis Report (UFSAR), Section 15.5.1.2, states, *The Inadvertent Operation of the ECCS during Power Operation event does not progress into a stuck open Pressurizer Safety Valve LOCA event. All three valves may lift in response to the event, but they will reclose. The resulting leakage from up to three pressurizer safety valves that are seated is bounded by flow through one fully open valve.*

The consequences of the event are bounded by the analysis described in UFSAR Section 15.6.1, "Inadvertent opening of Pressurizer Safety or Relief Valve." This event is also classified as an event of moderate frequency.

The Backfit Appeal Review Panel (BARP) report concluded that *the standard in place in 2001 and 2004 and at present is simply that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well informed staff engineering judgment and in the absence of a PSV failure to reseal, the Panel concluded that the concerns articulated by the NRC staff in the Backfit SE related to event classification, event escalation, and compliance with 10 GFR 50.34(b) and GDGs 15, 21, and 29 are no longer at issue.*

Conclusion:

Previously addressed and resolved

Petitioner's response:

In 2001, the NRR staff accepted Exelon's claim that their PSVs were qualified for water relief duty. Exelon's PSVs are examples of exactly the same Crosby PSV model that PG&E couldn't qualify three years earlier [19]. PG&E ultimately qualified its PORVs for water relief [20]. The BARP report labels the 2001 acceptance as *the standard in place* and then generalizes that to, *simply that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well informed staff engineering judgment*. The NRR staff's 2001 acceptance was a mistake. The mistake is discussed in the petition, and again in this letter. The NRR staff repeated this mistake in 2004. The mistake was not uncovered until the petitioner looked at the Byron and Braidwood licensing basis, in 2013 [18]. Thus began the backfit process.

The Backfit Rule rightly makes backfits difficult to order. The compliance exception requires the NRC staff to show that there are errors, and/or omissions that need to be rectified. This is why it took almost two years of extensive internal reviews to write and edit the backfit order that was finally issued in 2015. The internal reviews verified that the backfit order fulfilled the compliance exception's requirements.

Exelon appealed the backfit order, and lost. Then, Exelon appealed a second time, this time directly to the EDO, and easily won. The win was rapid, and all-encompassing. The EDO followed up by ordering the CRGR to begin the process of dismantling the compliance exception of the Backfit Rule, and formed the BARP to give him the technical basis he needed to justify his decision. He even appointed an executive to serve on both bodies.

In the end, the BARP failed to find the conclusive water qualification test results it needed to support the EDO's, and Exelon's position. It had to rely upon its *well informed staff engineering judgment* (i.e. an educated guess). It used this guess to conclude that, *the concerns articulated by the NRC staff in the Backfit SE related to event classification, event escalation, and compliance with 10 GFR 50.34(b) and GDGs 15, 21, and 29 are no longer at issue*. The EDO and the BARP worked to block the NRR staff's honest efforts to correct the errors and fill the gaps in Exelon's licensing bases. The BARP accomplished all of this without a public meeting. The PRB's review, which is full of errors, and omissions, relies heavily upon the BARP report's conclusions. Indeed, it cites the BARP's report 14 times!

Again, the petition states, *The only necessary analysis (i.e., the non-escalation case) is not submitted*. This refers to the UFSAR, which still does not present the required analysis.

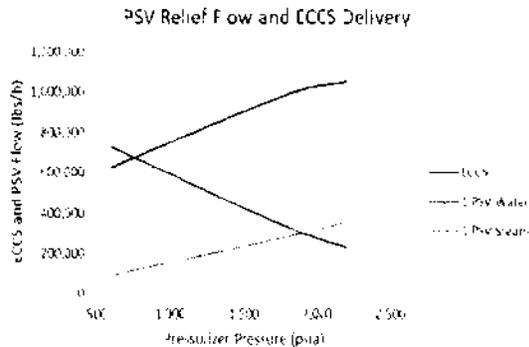
It is true that Exelon's July 5, 2000 letter mentions the criterion that prohibits Condition II events from generating more serious plant conditions. A mention does not constitute compliance.

A subsequent letter [7] states, *Normally, the PORVs will automatically open by means of the control system grade actuation circuit, preventing the RCS pressure from ever reaching the PSV lift setpoint*. The conservative case would model the opening of PORVs and assess the possibility of these valves failing open, after relieving water. This is not done. Instead, Exelon, and the NRC focus upon water relief through valves that should not open, at all.

In any case, PSV testing, under feedwater line break conditions, does not necessarily support the PORVs' water relief performance during IOECCS conditions. IOECCS conditions cause the

relief of relatively colder water. The difference is significant [19]. The NRC staff's conclusion of May 4, 2001 was wrong. It should have been based upon the operation of PORVs, not PSVs.

The following figure, copied from [2], shows that the water relief rate through one open PSV will be greater than one million lbs/h. The same curve could also be interpreted as representing the water leak rate through the three seated PSVs. The curve is based upon the calculated relief rate for saturated water. The calculated relief rate for subcooled water would be much higher. If the minimum expected discharge water temperature is as low as 590 °F, as claimed by Exelon [7], then the calculated water relief, or leak rate would be greater than 1.7 million lbs/h.



A leak rate that exceeds the ability of the normal makeup systems to replace the lost water is defined as a LOCA. So, an IOECCS that occurs in the Byron and Braidwood plants will result in a LOCA, even if all the PSVs reseal, after having relieved water. Furthermore, Exelon does not explain how an unisolable leak rate that exceeds one million lbs/h could be deemed to be an acceptable outcome for an AOO, and the NRC staff doesn't ask.

Exelon's letter [7], and UFSAR Section 15.5.1, also state that the consequences of the IOECCS are bounded by the UFSAR Section 15.6.1 analysis. However, it doesn't explain how water, whether it's relieved or leaked at 2500 psia, would be bounded by the steam relief from one PSV, at 2250 psia, and, again the NRC staff doesn't ask.

It also doesn't explain how a 33 second analysis (see UFSAR Table 15.6-1), to calculate the minimum DNBR, could bound the longer transient that would be necessary for a mass addition case. The bounding analysis would have to consider the Section 15.6.1 analysis with a PSV relieving water, not steam. This analysis would show that the open PSV will depressurize the RCS to the low pressurizer pressure ECCS actuation setpressure. The resulting ECCS flow, pumped at relatively low RCS pressure levels, would fill the pressurizer much sooner than would the IOECCS. In this case, the ECCS would not be inadvertently actuated, and should not be shut off, since the ECCS flow will be needed to respond to the small LOCA that results.

A spring-loaded PSV would not open inadvertently. This would require a mechanical fault, which would make the "inadvertently" opened PSV a Condition III event. However, an open PSV is considered in Chapter 15.6.1, as a Condition II event, solely as a conservative analysis assumption, since it's about twice the size of a PORV. This would depressurize the RCS, and erode the calculated DNBR at a greater rate. This is why this event is reported in Chapter 15.6.1 of some plants' FSARs as the "RCS Depressurization". This event is analyzed solely for the

purpose of demonstrating that the fuel cladding will not be damaged. The pressurizer filling case is not analyzed. So, Exelon refers to a "bounding" analysis that doesn't exist.

The PRB refers to Exelon's assertion, in its Updated Final Safety Analysis Report (UFSAR), Section 15.5.1.2, that, *The Inadvertent Operation of the ECCS during Power Operation event does not progress into a stuck open Pressurizer Safety Valve LOCA event. All three valves may lift in response to the event, but they will reclose. The resulting leakage from up to three pressurizer safety valves that are seated is bounded by flow through one fully open valve.*

The consequences of the event are bounded by the analysis described in UFSAR Section 15.6.1, "Inadvertent opening of Pressurizer Safety or Relief Valve." This event is also classified as an event of moderate frequency.

So, according to Exelon, the IOECCS will not progress into a *stuck open Pressurizer Safety Valve LOCA event*; but it could result in *leakage from up to three pressurizer safety valves that are seated*, and that this leakage would be equivalent to the *flow through one fully open valve*. This flow, whether it's water from three seated PSVs or water from one open PSV, is high enough to qualify it as a LOCA.

Here is a closer look at UFSAR Section 15.6.1, *Inadvertent opening of Pressurizer Safety or Relief Valve*:

| <u>Time</u> | <u>Event</u> |
|-------------|--|
| 0.0 sec | Safety valve opens fully |
| 24.2 sec | OTAT reactor trip setpoint is reached. |
| 32.2 sec | Rods begin to drop. |
| 32.8 sec | Minimum DNBR occurs. -- At this time, the analysis shows that the DNBR safety limit will not be violated. However, the PSV is still open, and depressurizing the RCS. |
| ~35.5 sec | Low pressurizer pressure produces an ECCS actuation signal (obtained from UFSAR Figure 15.6-2 [9]). In this case, ECCS would be actuated; and not inadvertently. The UFSAR does doesn't indicate how much ECCS flow is assumed. It would be conservative to assume a low ECCS flow (i.e., one train would be assumed to fail). |
| ~66 sec | Pressurizer fills (extrapolated from UFSAR Figure 15.6-2 [9]). |

Filling the pressurizer will not cause the opening of any additional valves, since the open PSV will prevent the pressurizer pressure from reaching their opening setpressures. The open PSV will initially relieve steam, and eventually water (after the pressurizer fills). The PSV need not be qualified for water relief, since the PSV would not be required to reseal. Therefore, there is no need to cite the BARP report. However, there is a need to do the analysis.

The BARP claims that the use of PSVs to relieve water was the *standard in place* in 2001 and 2004 and at present. In 1989, the standard was: *Repetitive or frequent challenges to the PSVs may prevent the PSVs from reseating with a potential for an unisolable small-break loss-of-coolant accident (LOCA)* [8]. Note that IN 89-90 does not specify whether the PSVs are

expected to relieve steam or water. That was not relevant in 1989. It's still not relevant. The NRC staff also does not explain when, and how the *standard in place* changed since 1989.

This is the third time the PRB invokes the BARP report (the first two instances are in the body of the letter [1]). According to the BARP's *well-informed staff engineering judgment*, the PSVs will not fail open after relieving water. Engineering judgment is just an educated guess, or opinion. The PRB claims this issue has been addressed. It was not.

Everyone is entitled to his own opinion, but not his own facts. -- Daniel Patrick Moynihan

Without data you're just another person with an opinion. -- W. Edwards Deming

4. Issue:

The missing non-escalation case analysis reveals a lack of understanding of the IOECCS. {Error 3}

Discussion:

As discussed above in Omission 1, the BARP report concluded that in the absence of a PSV failure to reseal, event escalation is no longer an issue.

Conclusion:

Previously addressed and resolved

Petitioner's response:

There are only three mass addition AOOs: the IOECCS, the CVCS Malfunction, and the IOPORV. It is required to show compliance with the non-escalation design requirement for all three. Exelon has not presented the required compliance analyses or evaluations for any of them.

The PORVs will open before any of the PSVs could open. Indeed, the opening of one PORV, during an AOO, will be sufficient to prevent the opening of any PSVs (water-qualified or not). Failure of a PORV to reseal will violate the non-escalation requirement, and this makes the water relief capability of the PSVs an irrelevancy.

This issue is not addressed; therefore it's not resolved.

This is the fourth time the PRB invokes the BARP report.

5. Issue:

The IOECCS evaluation is either non-conservative, or based upon a requirement to prevent the PORVs from opening. Either of these interpretations indicates the licensee lacks an understanding of the IOECCS. {Error 3}

Discussion:

If the PORVs are assumed to function normally (and credited in the safety analysis), the pressurizer would fill faster than with the use of the PSVs, given the lower setpoint pressure of the PORVs relative to the PSVs.

This is due to the flow characteristics of the ECCS pumps delivering more flow at lower RCS pressure. However, the difference in time to fill the pressurizer (i.e., time for the operators to take action to prevent liquid discharge) will be small and is not considered significant since operator action is not credited in the IOECCS analysis to stop the ECCS flow until liquid has already passed through the valves.

Conclusion: New issue, not significant

Petitioner's response:

The licensee does not exhibit an understanding of how conservatism is used in accident analyses.

The PRB staff doesn't mention the effect of pressurizer spray, which will also function, and will significantly increase the pressurizer fill rate. The staff doesn't describe how it determined that the difference in the time it takes to fill the pressurizer will be small. This would require a simulation, or some other kind of calculation.

The staff deems the time difference to be insignificant since operator action is not assumed to be taken in time to prevent liquid relief through the PORV(s). Recall that the non-escalation requirement is violated as soon as liquid passes through the PORVs, unless they're qualified for water relief. They're not. So, all PORVs that relieve water must be assumed to fail open. The staff's conclusion does not follow.

The NRC staff recognizes this as a new issue; but does not determine its significance. This, alone, is enough to accept the petition.

6. Issue:

There is no description of how the PORVs would respond to an IOECCS. {Omission 2}

Discussion:

As noted above, if the analysis were done crediting the PORVs (instead of the PSVs), the pressurizer would fill slightly faster, however, the end result would still be some liquid passing through a valve into the pressurizer relief tank as there is no operator action credited in the IOECCS analysis to stop the ECCS flow until after liquid has passed through the valves.

Conclusion:

New issue, not significant

Petitioner's response:

Exelon, and now the NRC staff, does not address the question of how or why the PORVs will not open when their opening setpoint (2350 psia) is reached. One open PORV will prevent the PSVs from opening.

If there is no operator action credited in the IOECCS analysis to stop the ECCS flow until after liquid has passed through the valves, then the PORVs will fail open, if they're not qualified for water relief. See Error 3 (above).

The question has been asked many times; but never answered. The NRC staff recognizes this as a new issue; but does not determine its significance

7. Issue:

The licensee does not justify the use of PSVs, in lieu of PORVs, to respond to AOOs. {Omission 3}

Discussion:

There is no requirement to justify the use of PSVs as opposed to PORVs. The Byron/Braidwood UFSAR, Section 5.4.13.1, states, "The pressurizer power-operated relief valves are not required to open in order to prevent the overpressurization of the reactor coolant system. The pressurizer safety valves by themselves are sized to relieve enough steam to prevent an overpressurization of the primary system." There is no statement that the PSVs cannot open during an AOO.

Petitioner refers to the American Nuclear Society (ANS), "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants." N18.2, 1973 (ANS N18.2-1973), statement that AOOs "shall be accommodated with, at most, a shutdown of the reactor with the plant capable of returning to operation after corrective action."

This does not imply that relief or safety valves for other systems cannot function during an AOO. There are many AOOs where relief or safety valves (in both the primary and secondary sides) are credited, including events such as excessive increase in secondary steam flow, loss of external electrical load/turbine trip and loss of normal feedwater flow. The NRC staff interprets the ANS standard to implicitly mean that no damage to reactor systems occurs while the worst thing occurring is a reactor shutdown.

Conclusion:

Not significant new information

Petitioner's response:

PORVs will open before PSVs; and no PSVs will open if a PORV is open. The use of PSVs, in lieu of PORVs, requires an explanation. The licensee is required to specify a conservative scenario that can be analyzed to demonstrate compliance with the design requirement. Opening PSVs, and not PORVs is not conservative for this case analysis. Assuming the PORVs will not open is like assuming the PORVs will not fail open, since PORVs that do not open cannot fail open. The licensee begs the question, and the NRC staff accepts this.

The petition [2] explains why the PSVs cannot function during an AOO. This is because, by the time the PSV opens, the AOO no longer exists. Section 2.1.2.3 of ANS N18.2-1973 [6] requires that, *Condition II incidents shall be accommodated with, at most, a shutdown of the reactor with the plant capable of returning to operation after corrective action.* If, after the reactor is shut down, the RCS pressure continues to rise, and reaches the RCS design pressure (i.e., the opening pressure setpoint of the PSVs), then the subject event is no longer a Condition II event. It must be classified as a Condition III or IV event. PSVs cannot operate during AOOs because, if they open, at 2500 psia, the AOO will have already become a Condition III or IV event.

Yes, there are many AOOs where relief or safety valves are credited. These are the RCS overpressure case analyses, wherein the PORVs are conservatively assumed to be unavailable. These analyses are performed to show that the PSVs have sufficient pressure relief capacity to prevent the RCS pressure from exceeding the pressure safety limit. So, the RCS overpressure case analyses are really design or component sizing analyses. This is why

Exelon can truthfully state, in its Byron/Braidwood UFSAR, Section 5.4.13.1, that, *The pressurizer safety valves by themselves are sized to relieve enough steam to prevent an overpressurization of the primary system.*

The Byron/Braidwood UFSAR, Section 5.4.13.3, states, *The pressurizer power relief valves prevent actuation of the fixed reactor high-pressure trip for all design transients up to and including the design step load decreases with steam dump. The relief valves also limit undesirable opening of the spring-loaded safety valves.* There are no AOOs that will require the opening of PSVs, other than in the conservatively artificial RCS overpressure case analyses.

For the BARP, it is no longer necessary for the PORVs to limit the opening of PSVs.

This issue is not addressed.

8. Issue:

The licensee makes an invalid comparison between two dissimilar events (inadvertent PSV opening and the IOECCS, with a stuck open PSV). (Error 4)

Discussion:

The licensee does not state that these two events are similar or directly comparable, rather that one event leads to the other.

While they aren't the same, it can be shown that the IOECCS can lead to an event similar to an inadvertent opening of a PSV (with different initial conditions) resulting in similar consequences (i.e., releases to the containment).

The NRC staff understood the licensee's comparison by stating in its May 4, 2001, SE that, *The licensee states that the resulting leakage from up to three PSVs is bounded by flow through one fully open PSV, which is an analyzed event.*

Conclusion:

Not significant new information

Petitioner's response:

The NRC staff's statement, in its May 4, 2001 SE, is not true. The fully open PSV is not an analyzed event. In order to claim that one event bounds another, it is necessary to first show that there is a basis for comparison.

The flow through one fully open PSV, as analyzed in UFSAR 15.6.1, is steam that is relieved at 2250 psia. This analysis is designed to minimize the calculated DNBR. Consequently, the analysis ends when the reactor is tripped, and there is no longer a possibility of any further decrease in calculated DNBR. The analysis is complete when it demonstrates that the minimum, calculated DNBR remains above the DNBR safety limit. RCS releases are not predicted.

The leakage from three seated PSVs is subcooled water. According to the discussion in Omission 1 (above), the leakage could be as high as 1.7 million lbs/h, and it would continue for several minutes (i.e., as long as it takes for the operator depressurize the RCS). This case is not analyzed.

The licensee claims the IOECCS event (UFSAR Chapter 15.5.1) proceeds to the Inadvertent Opening of a PSV (UFSAR 15.6.1). Specifically, the IOECCS event, a mass addition event, proceeds to the Inadvertent Opening of a PSV event, a DNB case that effectively ends with the reactor trip, at 32.8 seconds. The Inadvertent Opening of a PSV is not analyzed for mass addition concerns (e.g., releases). Therefore, the licensee's logic leads to an unanalyzed event. The NRC staff accepts this, and uses it to dismiss the issue in this petition.

This issue is not addressed.

9. Issue:

The licensee claims that ECCS flow will match PSV water relief rate. {Error 4}

Discussion:

Based on the text of the petition, the basis for identifying this as an error is predicated on assuming the PSVs fail open following liquid discharge. In its May 4, 2001, SE, the NRC staff states. *A review of the above stated EPRI test data indicates that the PSVs may chatter for the expected fluid inlet temperature but that the resulting PSV seat leakage following the liquid discharge would be less than the discharge from one stuck-open PSV, which is an analyzed event. Therefore, the NRC staff finds the licensee's crediting of the PSVs to discharge liquid water during the spurious SI event to be acceptable.* The BARP report states, *The Panel concluded that in 2001 and 2004 and at present, the known and established standard of the Commission is that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well-informed staff engineering judgment.* The flow out of the PSV will approximately match the flow from the ECCS provided the PSVs cycle open/closed to maintain pressure and do not leak. While the licensee assumes the valves reclose (consistent with the BARP report), they also conservatively assume the three PSVs may leak with an equivalent flow area of a single stuck open PSV (analyzed in FSAR Section 15.6.1). In this case, the flow out of the PSV will initially exceed the ECCS flow as the petitioner states. However, after some time the RCS pressure will decline to reach an equilibrium where flow out of the PSV is approximately equal to flow in from the ECCS.

Conclusion:

Not significant new information

Petitioner's response:

The Byron/Braidwood UFSAR, Section 15.5.1 [9] states, *Since the cause of the water relief is the ECCS flow, the magnitude of the leak will be less than or equivalent to that of the ECCS (i.e., operation of the ECCS maintains RCS inventory during the postulated event and establishes the magnitude of the subject leak).* This text is copied directly from a letter that Westinghouse (the Vendor) sent to its customers, in 1993 [10]. When this was written, in 1993, there were no plants that were equipped with water-qualified PORVs or PSVs. Any (unqualified) valves that relieved water were assumed to stick open.

Note that the statement refers to the *cause of the water relief*, not the water leak. Water relief could be through a normally functioning valve, as the NRC posits, or it may be through a stuck open valve. It is not a leak. If it were through a normally functioning valve, then there would be

no need to distinguish between a leak and a LOCA. That distinction is required only for a stuck open valve. to demonstrate that an AOO has not become a Condition III LOCA.

In this evaluation, the PRB construes this 1993 Westinghouse statement to mean that the water relief would be coming from a normally functioning valve. If this is true, then the rest of the statement, which defines a leak, would not be necessary, or even relevant.

The petition explains why the Emergency Core Cooling System cannot be regarded as a normal make up system. (See Error 6).

The PRB also accepts Exelon's claim that *three valves may leak with an equivalent flow area of a single stuck open PSV*, and that this case is analyzed in UFSAR Section 15.6.1. This case is not analyzed in UFSAR Section 15.6.1. The UFSAR Section 15.6.1 case considers an open PSV, relieving steam, for one minute; solely for purpose of showing that there is no fuel clad damage. The analysis that is needed to bound a mass-addition AOO doesn't exist.

The figure in [2] can be read as a comparison of ECCS delivery to PSV relief rate, or it can be read as a comparison of ECCS delivery to a PSV leak rate. Read it either way, the result is the same: there is an unaddressed issue.

Eventually, at the lower pressure levels, the ECCS delivery and PSV relief flows will balance.

- If the PSV is stuck open, then the flow balancing is irrelevant, since the non-escalation will have already been violated.
- If the PSV relief flow is leakage from three seated PSVs that is equivalent to one stuck open PSV, then the outcome for this AOO would be a leak of up to 1.7 million lbs/h. This greatly exceeds the ECCS delivery, so this would be defined as a LOCA. It is not analyzed in UFSAR Chapter 15.6.1, since the leakage is subcooled water, not steam. Furthermore, the PRB does not consider whether a leak rate of this magnitude, which could not be isolated, can be deemed to be an acceptable outcome for an AOO.

UFSAR Chapter 15.6.2.1 [9] considers the leak vs LOCA question with, *The maximum break size for which the normal makeup system can maintain the pressurizer level is obtained by comparing the calculated flow from the reactor coolant system (RCS) through the postulated break against the charging pump makeup flow at normal RCS pressure, i.e., 2250 psia. A makeup flow rate from one centrifugal charging pump is adequate to sustain pressurizer level and a pressure of 2250 psia for a break through a 0.375 inch diameter hole. ... A failure of a small line carrying primary coolant outside containment is classified as an ANS Condition II event, a fault of moderate frequency.*

An open PSV would create a 2.1 inch diameter hot leg break LOCA. (An open PORV would create a 1.6 inch diameter hot leg break LOCA.) The opening of either a PORV or a PSV would produce a water relief rate that cannot be replaced by normal charging makeup flow. Therefore, an open PORV or PSV that relieves water would be considered to be a small LOCA, a Condition III event. The open PSV, by the way, is not isolable. See UFSAR Table 15.6-1b [9] for the results of small break LOCA analyses (i.e., 1.5 inch, and 2 inch breaks).

This is the fifth time the PRB invokes the BARP report. In this case, the BARP report is irrelevant.

This issue is not addressed.

10. Issue:

The licensee fails to use due diligence when passing on vendor-supplied information to the NRC. (Error 5)

Discussion:

This statement is based on the issue in (Error 4), above, which was based on a Westinghouse document (NSAL-93-013). Although this is a new issue, it is not safety significant as noted above in (Error 4).

Conclusion:

Not significant new information

Petitioner's response:

The NRC monitors vendor-supplied information and components (e.g., the Vendor Inspection Program). There is a concern that regulated utilities do not do the same. It is clear that Exelon copied portions of NSAL-93-013, and sent them to the NRC without reviewing them. The result is the backfit, the appeal, the EDO's intervention, and the BARP report. The result is significant since it affects many licensees, and how they operate their plants. The NSAL incident is only one example.

The issue has still not been addressed. Therefore, its safety significance is not known.

11. Issue:

The licensee claims that the ECCS is a normal RCS makeup system. (Error 6)

Discussion:

The licensee does not explicitly state what the petitioner claims. In Section 15.5.1.2 of the UFSAR the licensee indirectly makes the claim that ECCS is a normal makeup system as they use this logic to demonstrate compliance with the acceptance criteria. The licensee provides an example (from ANS 51.1/N 18.2-1973) of a Condition II event as a *minor reactor coolant system leak which would not prevent orderly reactor shutdown and cooldown assuming makeup is provided by normal makeup systems only*. The licensee then states *operation of the ECCS maintains RCS inventory during the postulated event*. However, given that the inadvertent actuation of the ECCS is the initiating event, by definition, the ECCS will be operating but not providing a normal reactor coolant makeup function as described above. Therefore, this issue is not considered safety significant as inventory will be maintained in the RCS.

Conclusion:

Not significant new information

Petitioner's response:

The Emergency Core Cooling System is not a normal makeup system. The PRB's argument is sophism.

The petition [2] notes that the function of the ECCS is to flood the core, not to maintain a programmed pressurizer water level. The ECCS can fill the pressurizer, open the PORVs or PSVs, and cause them to relieve water. A normally functioning makeup system will not do that.

If a PORV or PSV fails to reseal, then the ECCS can cause a LOCA. It is ironic that the ECCS, which is designed to mitigate a LOCA, can cause one. There is a difference between maintaining inventory in the RCS, and overfilling it. There is also a question concerning the effect that the large difference between RCS outflow and inflow will have upon RCS water level until the flows can be balanced.

There are several instances, in PWR operating history, wherein the ECCS filled the pressurizer and caused the PORVs to open (e.g., Salem and Millstone). (Incidents that resulted in open PSVs are very rare.)

Overfilling is not limited to PWRs. For example, on January 13, 1977, the ECCS overfilled the reactor vessel at Gundremmingen, Unit A, a 237 MW BWR, in Germany. Within ten minutes, there were approximately three meters of standing water in the reactor building and the temperature had risen to nearly 80 °C. Too much water was introduced into the reactor for emergency cooling. Pressure relief valves released between 200 and 400 cubic meters of radioactive coolant water into the building. (The water was later spilled into the environment.) This incident ended Gundremmingen's short operating lifetime (1966 – 1977).

The PRB sees no difference between flooding the reactor vessel, and maintaining pressurizer water level. This issue is avoided.

12. Issue:

The licensee failed to identify and correct the Idaho National Engineering and Environmental Laboratory (INEEL) error in stating that the IOECCS will challenge both the PSVs and PORVs. The licensee transmitted INEEL's report to the NRC staff without verifying its accuracy. {Error 7}.

Discussion:

Under certain conditions, the NRC staff considers it possible to challenge both PORVs and PSVs during the same transient if the event lasts long enough. For example, if credited, the PORVs would open first, then, if they don't have power/instrument air and the N₂ tanks deplete, they fail closed. At this point, the PSVs would be relied upon for pressure relief. Both the licensee in its July 5, 2000, letter, as supplemented by its January 31, 2001, letter, and the NRC staff in its May 4, 2001, SE, mentioned the PORVs and their role in the IOECCS analysis. Both the PSVs and the PORVs may be challenged. Based on the above, the information is not significant.

Conclusion:

Not significant new information

Petitioner's response:

There are very few circumstances in which PORVs and PSVs could be open at the same time. This could happen, most notably, during loss of load or loss of feedwater Anticipated Transients without Scram (ATWS) events.

The PRB describes a scenario in which the PORVs and PSV will open sequentially. The PORVs will open, and then fail closed, which would be followed by the opening of PSVs. The NRC staff's scenario describes yet another way in which the non-escalation requirement can be violated. Failure of power/instrument air, or depletion of N₂ would be the consequential failure that drives the RCS pressure beyond the AOO range, to reach the PSV opening setpressure. The opening of a PSV, even if it relieves only steam, would be a Condition III event. Leakage from three seated PSVs would be a Condition II LOCA. The PORVs' supply of power/instrument air was upgraded by PSE&G, in 1997, as part of its effort to qualify them as a safety system.

The PRB does not address this issue.

13. Issue:

The licensee did not provide the valve test results needed to qualify the PSVs for water relief. {Omission 4}

Discussion:

The BARP report concluded, "Given the NRC staff's resolution of TMI [Three Mile Island] Action Plan, Item II.D.1, and the NRC staff's prior approvals reviewed by the panel, the panel concludes that the Office of Nuclear Reactor Regulation (NRR) staff's current application of the American Society of Mechanical Engineers (ASME) Code is not supported by the historical record."

In addition, "The panel did not find any evidence that the licensee had claimed or the NRC staff had believed that the valves were "qualified" in an ASME BPV [Boiler and Pressure Vessel] Code certification sense; rather, the record shows thorough consideration of the testing conducted on valves of the type installed at the plant and a well-informed technical judgment that this testing provided appropriate qualification."

Conclusion:

Previously addressed and resolved.

Petitioner's response:

Qualification of PSVs, for water relief, was not an issue until Exelon decided to rely upon them to respond to AOOs. Until now, PSVs were used to relieve steam, only. Water relief, during Condition IV events (e.g., feedwater line break) was not a concern, since the PSVs were not required to close after having relieved water. That is, until now.

Test results show that PSVs will fail or incur some damage if they're required to relieve water, especially subcooled water. Even if all the PSVs reseal, they could leak very badly. Furthermore, the leak will not be isolable. Recall that the ANS standard [6] states, *Condition II events shall be accommodated with, at most, a shutdown of the reactor with the plant capable of returning to operation after corrective action.* Correcting this situation will require more than a reactor shutdown. It will require repair or replacement of PSVs, when the reactor is in a cold shutdown condition. This could occur one or more time in a reactor year of operation.

The NRC staff does not explain how it resolved this situation. It simply invokes the BARP report, and its *well-informed engineering judgment*, for the sixth time, to pronounce the PSVs qualified for water relief.

Conclusion:

Not addressed

14. Issue:

The licensee analysis requires the PSVs relieve water, and then reseal. {Error 8}

Discussion:

The backfit appeal review panel "...concluded that in 2001 and 2004 and at present, the known and established standard of the Commission is that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well-informed staff engineering judgment. The Commission has not established a more detailed or prescriptive standard."

Conclusion:

Previously addressed and resolved.

Petitioner's response:

The NRC staff does not address the issue, at all. The issue concerns a design requirement, not a performance standard. The PRB invokes the BARP report, and its *well-informed engineering judgment*. for the seventh time, to pronounce the PSVs qualified for water relief.

The petition [2] states, *When the Licensee assumes the PSVs will relieve water, and then reseal, it effectively imposes two new design requirements on the PSVs. Currently, the PSVs are designed to operate during Condition IV accidents, like feedline breaks, and beyond design basis events, like anticipated transients without scram (ATWS), where RCS overpressure is the sole issue. Once opened, the PSVs will have fulfilled their RCS overpressure safety function. It is not necessary to require the PSVs to relieve water, and then reseal, unless they are intended to open during AOOs.*

The Licensee does not describe the design change process it used, including quality controls, to determine, and specify the functional, and component requirements for PSVs, when operated during AOOs (e.g., the IOECCS).

Conclusion:

This issue is avoided. Therefore, it's not addressed or resolved.

15. Issue:

The licensee does not describe the design change process it used, including quality controls, to determine, and specify the functional, and component requirements for PSVs, when operated during AOOs (e.g., the IOECCS). {Omission 5}

Discussion:

The Byron/Braidwood UFSAR, Section 5.4.13.1, states, "The pressurizer power operated relief valves are not required to open in order to prevent the overpressurization of the reactor coolant system. The pressurizer safety valves, by themselves, are sized to relieve enough steam to prevent an overpressurization of the primary system." There is no statement that the PSVs

cannot open during an AOO. There are many AOOs where credit is taken for relief and safety valves, including events such as excessive increase in secondary steam flow, loss of external electrical load/turbine trip and loss of normal feedwater flow.

BARP report. Section 4.2, states, "The Panel concluded that in 2001 and 2004 and at present, the known and established standard of the Commission is that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well-informed staff engineering judgment. The Commission has not established a more detailed or prescriptive standard." Based on the above, the issue is not significant and does not imply a new design function for the PSV.

Conclusion:

Not significant new information

Petitioner's response:

The issue follows from {Error 8}. The licensee imposes new design requirements upon the PSVs; but doesn't document them.

The Byron/Braidwood UFSAR, Section 5.4.13.3, states, "*The relief valves also limit undesirable opening of the spring-loaded safety valves*".

The pressurizer safety valves' ability to relieve enough steam to prevent an overpressurization of the primary system is not in question. The AOOs in which credit is taken for safety valves (in lieu of relief valves), including events such as excessive increase in secondary steam flow, loss of external electrical load/turbine trip and loss of normal feedwater flow, are analyzed to conservatively show that the RCS will not be overpressurized. They're also analyzed to size the PSVs. The AOOs, where credit is taken for relief and safety valves, require another fault, like a failure to trip (e.g., ATWS), in order to reach conditions that require the operation of both PORVs and PSVs.

BARP's conclusion that failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on *well-informed staff engineering judgment*, cannot be instantiated. EPRI's engineering judgment is different. This is found in the BARP report, *In 2004, EPRI issued Technical Report 1011047, which evaluated the potential increase in failure rates following steam and liquid relief through safety valves based on expert judgement. The report found that the increase in failure rates is difficult to estimate because of limited data. However, the experts considered that repeated water discharge through safety valves might cause increased chatter, and therefore, an increased failure rate.*

The BARP report alludes to four instances in which the PSVs opened. There is no information regarding the fluid that was relieved. However, it is reasonable to assume it was steam, since filling the pressurizer would be a notable, and reportable event. The PSVs failed to close completely, in two of these instances.

This issue is not addressed or resolved.

16. Issue:

The licensee fails to meet the GDC 21 single-failure requirement. {Error 9}

Discussion:

The BARP report found, *The determination that application of the single failure criterion is necessary first appears in the draft Revision 1 to RIS [Regulatory Issue Summary] 2005-29, which is still under development, and is not included in any final NRC requirement or guidance document reviewed by the panel.* In addition, the BARP report stated, *Finally, in the absence of a PSV failure to reseal, the Panel concluded that the concerns articulated by the NRC staff in the backfit SE related to event classification, event escalation, and compliance with 10 CFR 50.34(b) and GDCs 15, 21, and 29, are no longer at issue.*

Conclusion:

Previously addressed and resolved.

Petitioner's response:

GDC 21 applies to all automatic reactor protections systems, in US PWRs and BWRs, and predates the BARP report by decades. The BARP's position was taken without proper review, or even a public meeting. The NRC staff again cites the BARP report, herein for the eighth and ninth times, as if it were a known truth, and uses it to dismiss this issue. According to the BARP, the PSVs are exempt from meeting GDC 21, even if they relieve water.

If the BARP's *engineering judgment* is correct, and all opened PSVs eventually reseal, then they could leak as much as the relief rate of one PSV. Therefore, GDC 21 is violated, since the PSVs' safety function, as defined by Exelon and the BARP (i.e. to prevent escalation of the AOO) is lost. Pressurization, alone, to levels beyond the AOO range would violate the non-escalation requirement, and the leaking PSVs would violate GDC 21. The leaking PSVs would also be a LOCA.

The NRC staff notes that Revision 1 to RIS 2005-29 is still under development, and not included in any NRC requirement or guidance document. Neither is the BARP report. The EDO asked the Director of NRR for a review plan that would evaluate the PSV issues in RIS 2005-29 [13], the BARP report [5], and in Westinghouse's NSAL 93-013 [10]. That plan was due on January 13, 2017. The PRB staff does not disclose any elements of that plan, which should be available by now. Clearly, the issue is still not addressed.

This issue is not addressed or resolved.

17. Issue:

The licensee does not evaluate potential damage to the PSVs. {Omission 6}

Discussion:

By letter dated August 18, 1988 (ADAMS Accession No. ML003772409), the NRC staff provided its Technical Evaluation Report (TER) regarding the performance testing of relief and safety valves for the Byron (pages 161-188 of the file), and Braidwood Stations (pages 189-217 of the file). The TER discussed the chattering of the valves and evaluated damage found during subsequent inspection of the valves. The TER concluded that the valves performed satisfactorily.

Conclusion:

Previously addressed and resolved.

Petitioner's response:

Section 4.2.3, *Extended High Pressure Injection Event* of [14] states, *The limiting extended high pressure injection event is the spurious actuation of the safety injection system at power the potential for liquid discharge in extended HPI events can be disregarded.*

The PSVs were tested under feedwater line break conditions, not HPI event conditions. The discharged water, during a feedwater line break, would be relatively hotter. The report indicates, *there were four instances in which the test was terminated due to chattering on closing. Galled guiding surfaces and damaged internal parts were found during each inspection and the damaged parts were refurbished or replaced before the next test started. The test results showed that the valve performed acceptably in the test following each repair, but that closing chatter recurred in a subsequent test. These results suggest that inspection and maintenance are important to the continued operability of the valves. The Licensee should develop a formal procedure requiring that the safety valves be inspected after each actuation and the procedure should be incorporated into the plant operating procedures or licensing documents such as the plant technical specifications.*

The PRB does not indicate whether the recommended changes to the Byron and Braidwood plant operating procedures and licensing documents have been made.

The tests were conducted for steam and water relief, under feedwater line break conditions, not HPI event conditions. The report [14] states that the PSVs' performance were deemed to be acceptable, provided that they're inspected and repaired after each actuation. The NRC staff also doesn't discuss whether it considers damaged PSVs to be an acceptable outcome for an AOO.

This issue is not addressed.

18. Issue:

Application of the PSVs comes too late to meet the non-escalation requirement. (Error 10)

Discussion:

There are no requirements to limit PSVs to only operate during Condition III or IV events. The Byron/Braidwood UFSAR, Section 5.4.13.1, states, "The pressurizer power-operated relief valves are not required to open in order to prevent the overpressurization of the reactor coolant system. The pressurizer safety valves, by themselves, are sized to relieve enough steam to prevent an overpressurization of the primary system." This does not reference ANS categories as a requirement and does not say that the PSVs cannot open during an AOO. There are many AOOs where credit is taken for relief and safety valves, including events such as excessive increase in secondary steam flow, loss of external electrical load/turbine trip and loss of normal feedwater flow.

Conclusion:

Not significant new information

Petitioner's response:

The petition [2] was abundantly clear about this issue. Here it is again.

Recall that AOOs ... *shall be accommodated with, at most, a shutdown of the reactor* [3]. The high pressure reactor trip setpoint is 2400 psia. The opening setpoint of the PSVs is 2500 psia. Therefore, the PSVs will not open until after the event will have progressed beyond the defining boundary of an AOO. The event is no longer an AOO. Therefore, it must be a Condition III event. Worse, it is a Condition III event with the frequency of occurrence of an AOO. Worse still, the frequency of occurrence will be the sum of the frequencies of occurrence of all AOOs that pressurize the RCS to the opening setpressure of the PORVs.

The Licensee's compliance strategy, which somehow prevents the PORVs from opening, allows the RCS pressure to rise 100 psi beyond the reactor trip setpoint in order to open the PSVs. Therefore, it becomes necessary to generate a more serious plant condition in order to open any of the PSVs. In this respect, The Licensee begs the question. In other words, certain ANS Condition II events must be allowed to progress to more serious ANS Condition III events in order to demonstrate that those ANS Condition II events will not progress to more serious ANS Condition III events!

Consider, too, the words of the licensee, in its UFSAR. Section 5.4.13.3, *The pressurizer power relief valves prevent actuation of the fixed reactor high-pressure trip for all design transients up to and including the design step load decreases with steam dump. The relief valves also limit undesirable opening of the spring-loaded safety valves.*

The specific requirements the NRC staff seeks do not exist because they're already in [3]. They've been there since 1973.

Again, the AOOs in which the PSVs are actuated are conservative, licensing/design case analyses, not scenarios that are expected to occur.

This issue is not addressed.

19. Issue:

There is no evaluation of the number of pressurization cycles against the plant's limit. (Omission 7)

Discussion:

The petition does not provide facts to support the statement. As stated in MD 8.11, the NRC staff will not review a petition if the petition "fails to provide sufficient facts to support the petition but simply alleges wrongdoing, violations of NRC regulations, or existence of safety concerns"

Conclusion:

New issue. Petition did not provide sufficient facts to support conclusion.

Petitioner's response:

The Byron/Braidwood UFSAR, Section 5.2.2.4, *Equipment and Component Description* states, *The operation, significant design parameters, number and types of operating cycles, and environmental qualification of the pressurizer safety valves are discussed in Subsection 5.4.13". The number and types of operating cycles are not there.*

However, the Byron/Braidwood UFSAR, Section 3.9, states,

"Several events can be postulated as occurring during normal plant operation which will cause rapid depressurization of the RCS. These include:

- a. actuation of a single pressurizer safety valve;*
- b. inadvertent opening of one pressurizer power-operated relief valve due either to equipment malfunction or operator error;*
- c. malfunction of a single pressurizer pressure controller causing two pressurizer spray valves to open;*
- d. inadvertent opening of one pressurizer spray valve, due either to equipment malfunction or operator error;*

and

- e. inadvertent auxiliary spray.*

Of these events, the pressurizer safety valve actuation causes the most severe transients, and is used as an "umbrella" case to conservatively represent the reactor coolant pressure and temperature variations arising from any of them.

When a pressurizer safety valve opens and remains open, the system rapidly depressurizes, the reactor trips, and the emergency core cooling system (ECCS) is actuated. Also, the passive accumulators of the ECCS are actuated when pressure decreases by approximately 1600 psi, about 12 minutes after the depressurization begins. The depressurization and cooldown are eventually terminated. All of these effects are completed within approximately 18 minutes. It is conservatively assumed that none of the pressurizer heaters are energized. With pressure constant and safety injection in operation, boil-off of hot leg liquid through the pressurizer and open safety valve will continue.

For design purposes this transient is assumed to occur 20 times during the 40-year design life of the plant.

This deals with only the depressurization. Pressurization cycles are also a concern. If the PSVs are to be used more frequently, as an IOECCS mitigation system, then this type of cycle information becomes important, and should be considered as part of the design change.

The NRC staff did not seek such information from the licensee. Instead, the PRB cites a largely irrelevant passage in MD 8.11 to dismiss the issue.

This issue is not addressed.

20. Issue:

The licensee creates a new accident and does not address the new accident in its no significant hazards statement. (Error 11, Omission 8)

Discussion:

The opening of a PSV during an AOO is not by itself, a new accident. Additionally, BARP report, Section 5 - states, "... in the absence of a PSV failure to reseal, the Panel concluded that the

concerns ... related to event classification, event escalation, and compliance with 10 CFR 50.34(b) and GDCs 15, 21, and 29 are no longer at issue."

Therefore, in the absence of assuming the PSV fails open, there is no possibility of a new accident.

Conclusion:

Not significant new information

Petitioner's response:

The NRC staff cites the BARP report, herein for the tenth time, as if it were a known truth, and uses it to dismiss this issue.

The petition describes AOOs that pressurize the RCS to the PSV opening setpoint (i.e., the RCS design pressure). These are AOOs that can pressurize the RCS, including a loss of load or loss of feedwater. The frequency of occurrence for these AOOs is their sum. It would be the sum of the frequencies of occurrence of the several AOOs in which PSVs are opened, in lieu of PORVs, as per Exelon's analyses.

In the 1980s, the NRC was concerned with the high frequency (at that time) of unnecessary automatic reactor trips. The new AOOs could pose a greater threat to the public health and safety than the unnecessary automatic reactor trip, since the consequences of these events could be greater.

If the BARP's engineering judgment is correct, then there will not be a stuck open PSV. Instead, there will be three seated PSVs that will leak water at a rate that will equal the water relief through a stuck open PSV. A leak of that magnitude will be defined as a LOCA.

Therefore, there will be a Condition II LOCA, with subcooled water releases through a stuck open PSV or three leaking, seated PSVs. This accident has not been analyzed. This is a new accident that can be created without having to assume that any PSVs fail open. (Note that this LOCA must meet Condition II acceptance criteria.)

This issue is not addressed.

21. Issue:

The licensee employed a circular logic that failed to demonstrate that the Byron/Braidwood plant design meets all of its design requirements

Discussion:

BARP report, Section 5, states, ... *in the absence of a PSV failure to reseal, the Panel concluded that the concerns ... related to event classification, event escalation, and compliance with 10 CFR 50.34(b) and GDCs 15, 21, and 29 are no longer at issue.*

Conclusion:

Not significant new information

Petitioner's response:

The NRC staff cites the BARP report, herein for the 11th time, as if it were a known truth, and uses it to dismiss this issue, without even discussing it.

Recall that the PORVs are designed to prevent unnecessary challenges to the PSVs. They will open before the PSVs. The Licensee's compliance strategy assumes that the PORVs will not open, at all. This assumption is necessary in order allow the RCS pressure to reach the PSV opening setpressure. Then Exelon's water-qualified PSVs will open, and reseal.

If the PORVs will not open, then they cannot fail open. There is no analysis to show that the PORVs will not fail open. This would be the missing non-escalation (or pressurizer filling) case. The licensee demonstrates compliance with the non-escalation requirement, at least for the PORVs, by assumption. Reaching the desired outcome by assuming it in the premise is the very definition of circular reasoning.

The PRB avoids this issue by citing the BARP report, which is itself a good example of circular reasoning.

22. Issue:

The technical review staff of the NRC's NRR had approved the licensee's applications for power upratings for the Byron and Braidwood plants that claimed it had complied with a key design requirement, which requires nuclear plants to be designed in a way that prevents AOOs from developing into more serious events. The licensee's claim relied upon its plants' PSVs to perform safety functions that are outside their design basis

Discussion:

The BARP report "...concluded that in 2001 and 2004, and at present, the known and established standard of the Commission is that the failures of PSVs need not be assumed to occur following water discharge if the likelihood is sufficiently small, based on well-informed staff engineering judgment. The Commission has not established a more detailed or prescriptive standard." In addition, the BARP report, Section 5 states, "... in the absence of a PSV failure to reseal, the Panel concluded that the concerns ... related to event classification, event escalation, and compliance with 10 CFR 50.34(b) and GDCs 15, 21, and 29 are no longer at issue."

Conclusion:

Previously addressed and resolved.

Petitioner's response:

The NRC staff cites the BARP report, twice, as if it were a known truth, and uses it to dismiss this issue, without even discussing it. If it's true that, in 2001 and 2004, *the known and established standard* was that failures of PSVs need not be assumed to occur following water discharge, then this standard should have been cited in the NRC staff's safety evaluations for Exelon's and other licensees' plants. That would have made the safety evaluations simple, since it could have been a generic conclusion. This was not done. As late as 2014, in Exelon's UFSARs, the operation of PSVs, even to relieve steam, is described as "undesirable".

This issue, like the issue concerning Exelon's missing design change documentation, concerns Exelon's claim that it can rely upon its plants' pressurizer safety valves (PSVs) to perform safety

functions that are outside their design basis. The PSVs are designed to relieve steam, not water.

These are the 12th and 13th times the PRB invokes the BARP report to avoid the issue.

This issue is not addressed.

23. Issue:

The licensee submitted, under Oath and Affirmation, a statement of no significant hazards, as per 10 CFR Section 50.92

Discussion:

The opening of a PSV during an AOO is not, by itself, a new accident. Additionally, BARP report. Section 5 - states, "... in the absence of a PSV failure to reseal, the Panel concluded that the concerns ... related to event classification, event escalation, and compliance with 10 CFR 50.34(b) and GDCs 15, 21, and 29, are no longer at issue." Therefore, in the absence of assuming the PSV fails open, there is no possibility of a new accident. Without the possibility of a new accident, the statement of no significant hazards isn't in error.

Conclusion:

Not significant new information

Petitioner's response:

Again, PSVs cannot open in time to respond to an AOO. Using the PSVs to respond to an AOO is like operating the ECCS to respond to a core meltdown. It won't accomplish the required safety function. It could actually aggravate the situation.

The PRB invokes the BARP report, and its *well-informed engineering judgment*, for the 14th time, to declare "there is no possibility of a new accident". If, as the BARP claims, the PSVs will not stick open, then all the PSVs will close, after relieving water; but the high leakage that flows from the seated PSVs, would be a new, unanalyzed accident. It would be a Condition II LOCA.

The creation of a new accident deals with only one of the three questions in 10 CFR Section 50.92. The other two are not even mentioned. The three questions, as discussed in [2], are:

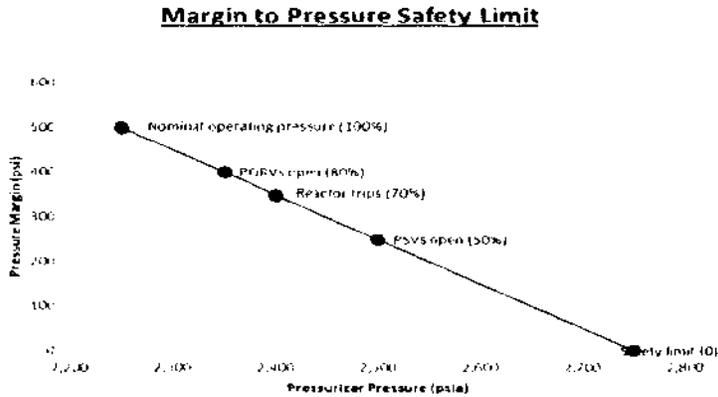
- (1) *Involve a significant increase in the probability or consequences of an accident previously evaluated; or*
- (2) *Create the possibility of a new or different kind of accident from any accident previously evaluated; or*
- (3) *Involve a significant reduction in a margin of safety.*

Questions (1) and (2) pertain to the Condition II LOCA, described above. This accident is both new and more probable. (1) The previously analyzed Condition III LOCA becomes a more-frequent AOO, and (2) the leakage-based LOCA is new.

The PRB evaluation does not even mention the question regarding margin reduction.

When the PORVs are applied, the margin of safety, to RCS overpressure is 400 psi (2750 psi minus 2350 psi). When the PSVs are applied, the margin of safety, to RCS overpressure is reduced to 250 psi (2750 psi minus 2500 psi). The margin of safety is thus reduced by 37.5%. For perspective, 150 psi is more than half the pressure that is developed inside the boiler of a steam locomotive. Note that the question has nothing to do with the valves' performance under steam or water relief conditions.

Exelon's plan to use PSVs, in lieu of PORVs, significantly reduces pressure safety margin, as depicted in the following figure.



The licensee submitted, under Oath and Affirmation (see 10 CFR §50.30(b) for a definition, and requirements), a statement of no significant hazards, as per 10 CFR §50.92 (i.e., with negative responses to all the questions). The petition shows that all the responses should be affirmative. Therefore, the licensee's statement of no significant hazards, as per 10 CFR §50.92, could contain some false statements that are actionable under the False Statements Act (18 USC §1001).

This issue is not addressed.

24. Issue:

The CVCS [chemical and volume control system] malfunction does not lead to an immediate reactor trip. An analysis is necessary to demonstrate that the reactor is automatically tripped before any fuel clad damage can be incurred. Exelon does not provide one. Instead, it points to another, dissimilar event analysis, the CVCS Malfunction that Increases Reactor Coolant Inventory. This event is a reactivity anomaly, not a mass addition event. It cannot be used to address a mass addition event

Discussion:

The mass addition as a result of a malfunction of the CVCS is bounded by the IOECCS because only the charging pumps would be putting mass in, since the SI pumps would not start and inject. The referenced malfunction (UFSAR Section 15.4.6) shows that mass injection is limited to 205 gallons per minute. If no operator action is taken, the over temperature delta temperature or the high neutron flux trips the reactor before DNBR limits are exceeded. Therefore, the issue is not significant.

Conclusion:

Not significant new information

Petitioner's response:

The CVCS malfunction is listed twice in RG 1.70: once as a mass addition event, and once as a reactivity anomaly. Analysis or evaluation of the CVCS malfunction mass addition cannot be omitted by referring to the analysis of the CVCS malfunction reactivity anomaly (i.e., the boron dilution event). They're not equivalent, and certainly not interchangeable. RG 1.70 guidelines indicate that licensing bases should contain analyses or evaluations of both types of CVCS malfunction events.

The following table summarizes the differences between the inadvertent ECCS operation event, and the two CVCS malfunction events.

| | Inadvertent ECCS operation | CVCS malfunction (mass addition) | CVCS malfunction (boron dilution) |
|----------------------|---|--|---|
| Cause | Electrical fault, failed sensor, or operator error | | |
| Analysis objective: | Event will not develop into a Condition III or IV event | | Event will not lead to any fuel clad damage |
| Reactor trip | Immediate; due to the ECCS actuation signal | High pressure, water level, or manual | OTΔT and various neutron flux-based trips |
| Analysis | Whole plant simulation, with a pressurizer model | Whole plant simulation, with a pressurizer model | Reactivity balance, without a pressurizer model |
| Relief flow | Steam (and water, if the pressurizer fills) | | |
| ECCS (charging) flow | Maximum ECCS flow (all pumps delivering borated water) | Maximum of normal charging flow (borated water) | Maximum of normal charging flow (clean water) |
| Pressure control | PORVs, spray, and heaters are assumed to be operable | | Pressurizer level sensor fails low |

Exelon, and the PRB observe that the charging flow, during a CVCS malfunction (boron dilution), will be lower than the charging flow during an IOECCS. They use the relatively lower flow rate to conclude that the IOECCS will bound the (unanalyzed) CVCS malfunction (mass addition). However, they don't consider the heat that is added to the RCS by the power that is generated prior to the time that the reactor is tripped, during the CVCS malfunction events. The water swelling caused by this heat addition rules out a direct comparison.

It is also notable that the CVCS malfunction (boron dilution) analyses are basically reactivity balances that do not even model the pressurizer. (The pressurizer is not in an active flow zone.)

This issue is not addressed.

It is significant that the PRB's discussion repeats the licensee's error.

References

- [1] June 23, 2017, OEDO-16-00783 – Closure Letter for Samuel Miranda, Citizen, Email Re: 2.206 – Enforcement Petition Regarding Exelon's Byron and Braidwood Stations (ADAMS Accession No. ML16327A598)
- [2] November 15, 2016, Enforcement Petition (10 CFR 2.206) Regarding Exelon's Byron and Braidwood Stations, Samuel Miranda, (ADAMS Accession No. ML17010A051)
- [3] U.S. NRC, letter from George F. Dick, Jr., to Oliver D. Kingsley, Exelon Generation Company, LLC, "Issuance of Amendments; Increase in Reactor Power, Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 (TAC Nos. MA9428, MA9429, MA9426, and MA9427)," dated May 4, 2001 (ADAMS Accession No. ML033040016)
- [4] U.S. NRC, letter from Joel S. Wiebe to Michael J. Pacilio, Exelon Generation Company, LLC, "Braidwood Station, Units 1 and 2, and Byron Station, Unit Nos. 1 and 2 - Issuance of Amendments Regarding Measurement Uncertainty Recapture Power Uprate (TAC Nos. MF2418, MF2419, MF2420, and MF2421)," dated February 7, 2014 (ADAMS Accession No. ML13281A000)
- [5] Report of the Backfit Appeal Review Panel Chartered by the Executive Director for Operations to Evaluate the June 2016 Exelon Backfit Appeal, Gary M. Holahan, K. Steven West, Thomas G. Scarbrough, Michael A. Spencer, and Theresa V. Clark, dated August 23, 2016 (ADAMS Accession No. ML16236A208)
- [6] American Nuclear Society, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants, ANS-N18.2-1973, La Grange Park, Illinois, August 6, 1973
- [7] Letter from Exelon to U.S. NRC, *Response to Request for Additional Information Regarding the License Amendment Request to Permit Uprated Power Operations at Byron and Braidwood Stations*, RS-01-110, January 31, 2001 (ADAMS Accession No. ML010330145)
- [8] December 28, 1989, NRC Information Notice No. 89-90: *Pressurizer Safety Valve Lift Setpoint Shift*, (ADAMS Accession No. ML031190006)
- [9] The Licensee Generation Company, LLC, "Byron/Braidwood Nuclear Stations Updated Final Safety Analysis Report (UFSAR)," Revision 15, dated December 2014 (ADAMS Accession No. ML14363A495)
- [10] NSAL-93-013. G.G. Ament and K.J. Vavrek, Westinghouse ESBU, June 30, 1993, and NSAL-93-013, Supplement 1, J.S. Galembush, Westinghouse ESBU, October 28, 1994 (ADAMS Accession No. ML052930330)
- [11] U.S. NRC, Salem Nuclear Generating Station, Unit Nos. 1 and 2 (TAC Nos. M97827 and M97828), dated June 4, 1997 (ADAMS Accession No. ML011720397)
- [12] Transcript of Petitioner's meeting with the Petition Review Board on March 15, 2017 (ADAMS Accession No. ML17089A581)
- [13] Memorandum from Victor M. McCree to William M. Dean, *Result of Appeal to the Executive Director for Operations of Backfit Imposed on Byron and Braidwood Stations*

Regarding Compliance with 10 CFR 50.34(b), GDC 15, GDC 21, GDC 29, and the Licensing Basis, September 15, 2016 (ADAMS Accession No. ML16246A247)

- [14] WCAP-15364, *Braidwood Unit 1 Heatup and Cooldown Limit Curves for Normal Operation*, E. Terek, September 2000, (ADAMS Accession No. ML003772409)
- [15] *Strategies to Prevent Benign Transients from Becoming Serious Accidents*, Samuel Miranda, Paper No. ICONE24-60472, pp. V002T08A004; 14 pages, doi:10.1115/ICONE24-60472, © ASME, copy available at -- <http://proceedings.asmedigitalcollection.asme.org/proceeding.aspx?articleid=2577045>
- [16] *Byron/Braidwood Nuclear Stations Updated Final Safety Analysis Report (UFSAR), Revision 10*, dated December 2004, Chapter 3.9 (ADAMS Accession No. ML17086A600)
- [17] Letter from S. Miranda to Senators Barrasso, Capito, Carper, and the members of Subcommittee on Clean Air and Nuclear Safety, June 15, 2017
- [18] December 13, 2013, NCP-2013-014, Comments for the NCP Reviewer to Consider (ADAMS Accession No. ML14052A431)
- [19] LER 98-001-01, *Diablo Canyon Units 1 and 2, Pacific Gas & Electric, Reactor Coolant System Outside Design Basis for Inadvertent Emergency Core Cooling System Actuation at Power Due to Non-Conservative Assumptions for Pressurizer Safety Valve Operation*, October 22, 1998, Accession No. 9810270409
- [20] *Diablo Canyon Power Plant, Unit Nos. 1 and 2 - Issuance of Amendment Re: Credit for Automatic Actuation of Pressurizer Power Operated Relief Valves*, USNRC (ADAMS No. ML041950260)

Holahan, Gary

From: West, Steven
Sent: Monday, April 24, 2017 10:44 AM
To: Boland, Anne
Cc: Cupidon, Les; McDermott, Brian; Wert, Leonard; Holahan, Gary; Ordaz, Vonna; Moore, Scott; Williamson, Edward; Monninger, John
Subject: Re: Recent Communications Regarding the Backfit Rule and CRGR

Follow Up Flag: Follow up
Flag Status: Flagged

Anne,

Could you and Les take a look at Mr. Miranda's comments and draft a supplement to the meeting summary? My memory is that we covered his comments in the same level of detail as the other commenters, but maybe not. Nevertheless, because Mr. Miranda did not participate in the meeting, his comments were not captured in the transcript.

Also, Les has already confirmed that the Web link we included in our meeting summary is valid. If we issue a supplement, we could include both links.

Also, does Les have a table that shows each public comment?

Steve

Steven West, Deputy Director
Office of Nuclear Security and Incident Response
U.S. Nuclear Regulatory Commission

----- Original Message -----

From: "McCree, Victor" <Victor.McCree@nrc.gov>
Date: Fri, April 21, 2017 3:26 PM -0500
To: "West, Steven" <Steven.West@nrc.gov>
CC: "Cupidon, Les" <Les.Cupidon@nrc.gov>, "Doane, Margaret" <Margaret.Doane@nrc.gov>, "Jones, Bradley" <Bradley.Jones@nrc.gov>, "Dean, Bill" <Bill.Dean@nrc.gov>, "Boland, Anne" <Anne.Boland@nrc.gov>, "McDermott, Brian" <Brian.McDermott@nrc.gov>, "Moore, Scott" <Scott.Moore@nrc.gov>, "Williamson, Edward" <Edward.Williamson@nrc.gov>, "Wert, Leonard" <Leonard.Wert@nrc.gov>, "Holahan, Gary" <Gary.Holahan@nrc.gov>, "Ordaz, Vonna" <Vonna.Ordaz@nrc.gov>
Subject: Recent Communications Regarding the Backfit Rule and CRGR

Steve,

As you may know, I was copied on two recent e-mails, dated March 6 and April 17, 2017, from former NRC employee Sam Miranda. In the emails, Mr. Miranda discusses the compliance exception to the Backfit Rule and the Exelon Backfit Appeal and raises three issues that merit a response:

1. The **CRGR public meeting summary** does not adequately reflect his (Sam Miranda's) input, including an ASME link that "misleads readers";
2. You (Steve West) have a **conflict-of-interest** in your role as acting CRGR Chairman because you were a member of the Exelon Backfit Appeal Panel; and,
3. The CRGR and the Commission are working to **dismantle the Compliance Exception** in the Backfit Rule... without Rulemaking.

In considering these issues, I acknowledge Mr. Miranda's 2.206 petition, dated November 15, 2016, on this same topic, which I referred to NRR for appropriate action. My thoughts on his e-mails, however, which are separate from his 2.206 petition and should not be used to influence its disposition, are as follows:

1. **CRGR public meeting summary:** Regarding this issue, we should strive to assure that our meeting summaries adequately reflect stakeholder comments. So, if you have not already done so, please take steps to verify that Mr. Miranda's views are appropriately represented in the summary of the February 28th meeting, including confirming that the ASME paper he authored is readily available to interested parties.
2. **Conflict-of-Interest:** As for this issue, I recognize that the CRGR is following my direction to review the training, guidance and knowledge management for the Backfit Rule, and other direction consistent with the Commission's decision and OGC interpretation. In carrying out this direction, I have seen no evidence that you are advancing personal interests or pursuing a separate agenda. While it is a fact that the CRGR is not re-considering the agency decision on the Exelon appeal nor the related 2.206 Petition, the ongoing consideration of issues related to the Compliance Exception to the Backfit Rule stems from OGC's interpretation and Commission direction on this matter, not from you or the Backfit Appeal Panel. Further, the CRGR is comprised of seven senior managers and its recommendations and decisions are made collegially, not unilaterally. In sum, I have no evidence or information that provides reasonable indication that you have a conflict-of-interest. I support and appreciate your continued service as acting Chairman of CRGR in Ed Hackett's absence.
3. **Dismantling the Compliance Exception:** On this issue, I would simply remind you, as acting CRGR Chairman, to continue to follow OGC (and/or Commission) direction (per 10 CFR 50.3) on application of the Compliance Exception, while being aware of Mr. Miranda's concerns and contrary views.

Finally, I understand that the e-mails from Mr. Miranda have been forwarded to OIG (Rossana Raspa) by Anne Boland. Given the tone and content of some of Mr. Miranda's assertions (e.g. suggesting that the Backfit Appeal Panel Report was directed to support a predetermined conclusion), it was appropriate to inform the OIG for whatever action it deems appropriate.

Please let me know if you have any questions.

Thanks, Vic

Victor M. McCree
Executive Director for Operations
U.S. Nuclear Regulatory Commission
Mail Stop O-16E15
Washington, DC 20555-0001
(o) 301-415-1700

Visitor Log for NRC HQ from February 1, 2017 to August 31, 2017

| Date Visit Logged | Last Name | First Name | Company |
|--------------------------|------------------|-------------------|-----------------------------------|
| 2/10/2017 | Jury | Keith | Exelon |
| 2/10/2017 | Greenlee | Scot | Exelon |
| 2/10/2017 | Fewell | Brad | Exelon |
| 2/10/2017 | Hanson | Bryan | Exelon |
| 2/10/2017 | Kelley | Chris | Exelon |
| 2/10/2017 | Karney | Mike | Exelon |
| 2/13/2017 | Reddick | Dariani | Exelon Corporation |
| 2/15/2017 | Krueger | Gregory | Exelon |
| 2/16/2017 | KREJCIE | JESSICA | Exelon |
| 2/16/2017 | REDDICK | DARANI | Exelon |
| 2/16/2017 | AMWAY | PHILLIP | Exelon |
| 2/16/2017 | Russ | Paul | WESTINGHOUSE ELECTRIC COMPANY LLC |
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| 2/2/2017 | Zorzi | Julia | Westinghouse |
| 2/2/2017 | Monahan | Jill | Westinghouse |
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| 2/21/2017 | Greenlee | Scot | EXELON |
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| 2/22/2017 | Easterling | Rick | Westinghouse |
| 2/23/2017 | Weaver | Douglas | Westinghouse |
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| 2/23/2017 | WERNER | TARA | Westinghouse |
| 2/23/2017 | FERGUSON | JEFFERY | WESTINGHOUSE ELECTRIC |
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| 2/23/2017 | GARNER | RONNIE | Westinghouse |
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| 2/23/2017 | Friant | Carl | Exelon |
| 2/24/2017 | Lloyd | Timothy | Westinghouse |
| 2/24/2017 | Tsang | Irving | Westinghouse |
| 2/24/2017 | Sisk | Rob | Westinghouse |
| 2/27/2017 | Shockling | michael | WESTINGHOUSE ELECTRIC COMPANY LLC |
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| 2/28/2017 | Elias | Vince | Westinghouse |
| 2/28/2017 | Cirilli | James | Exelon |
| 2/28/2017 | Marlette | Steve | Westinghouse |
| 2/6/2017 | Nowinowski | Tony | Westinghouse |
| 2/6/2017 | Mirizio | Damian | Westinghouse |

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| 2/6/2017 | Higby | Melinda | Westinghouse |
| 2/6/2017 | Baier | Susan | Westinghouse |
| 2/6/2017 | Becker | Thomas | Westinghouse |
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| 2/6/2017 | Andrachek | James | Westinghouse |
| 2/8/2017 | Schrage | John | Exelon |
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| 2/8/2017 | Sung | Yixing | Westinghouse |
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| 3/13/2017 | POURNIA | FARAMA | Exelon |
| 3/13/2017 | COKER | MICHAEL | Exelon |
| 3/13/2017 | LINTHICUM | ROY | Exelon |
| 3/15/2017 | reddick | darani | Exelon |
| 3/16/2017 | amway | phillip | Exelon |
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| 3/23/2017 | LAPRESTI | MICHAEL | WESTINGHOUSE ELECTRIC |
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| 3/23/2017 | Landale | Jim | Exelon |
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| 3/6/2017 | Rodack | Thomas | Exelon |
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| 4/18/2017 | Sisk | Robert | WESTINGHOUSE ELECTRIC |
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| 5/16/2017 | Warren | Vicki | Exelon |

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| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | Maguire | Amanda | WESTINGHOUSE ELECTRIC |
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| 6/15/2017 | Parr | Nancy | Westinghouse |
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| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | Mascitelli | Frank | Exelon |
| 6/2/2017 | Barstow | James | EXELON |
| 6/2/2017 | Grobe | JOHN | EXELON |
| 6/20/2017 | Greenlee | Scot | Exelon |
| 6/20/2017 | Odell | Drew | Exelon |
| 6/20/2017 | SISK | ROB | WESTINGHOUSE |
| 6/20/2017 | ODESS-GILLET | WARREN | WESTINGHOUSE |
| 6/21/2017 | LINTHICUM | ROY | Exelon |
| 6/21/2017 | ODESS-GILLET | WARREN | WESTINGHOUSE |
| 6/21/2017 | SISK | ROB | WESTINGHOUSE |
| 6/22/2017 | McGillicuddy | Kailyn | Westinghouse |
| 6/29/2017 | Neckowicz | Ted | Exelon |
| 6/29/2017 | Basso | Tom | Exelon |
| 6/29/2017 | DiRado | Mark | Exelon |
| 6/29/2017 | Greenlee | Scot | Exelon |

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|-----------|------------|-------------|-----------------------|
| 6/29/2017 | Weaver | Douglas | Westinghouse |
| 6/30/2017 | Sleigh | Mike | Westinghouse |
| 6/30/2017 | Kostelnik | JOHN | Westinghouse |
| 6/30/2017 | Reed | Steve | Westinghouse |
| 6/5/2017 | SISK | ROBERT | Westinghouse |
| 6/6/2017 | Linthicum | Roy | Exelon |
| 6/6/2017 | Cavedo | Rob | Exelon |
| 6/6/2017 | Gudger | David | Exelon |
| 6/6/2017 | Doran | Dan | Exelon |
| 6/7/2017 | Jean | Uldrick | EXELON |
| 6/7/2017 | Schade | Eric | EXELON |
| 6/7/2017 | SISK | ROB | Westinghouse |
| 6/8/2017 | Connelly | John | Exelon |
| 6/8/2017 | DOHSE | SCOTT | EXELON |
| 6/8/2017 | ALTIZER | JACK | EXELON |
| 6/9/2017 | Fewell | Brad | Exelon |
| 6/9/2017 | Fewell | Brad | Exelon |
| 6/9/2017 | Greenlee | Scot | Exelon |
| 6/9/2017 | Hanson | Bryan | Exelon |
| 6/9/2017 | Mudrick | Chris | EXELON |
| 7/12/2017 | long | yun | Westinghouse |
| 7/12/2017 | mcdaniel | zachary | Westinghouse |
| 7/12/2017 | kersting | paul | Westinghouse |
| 7/12/2017 | mercier | edmond | Westinghouse |
| 7/12/2017 | Malikowski | Heather | Exelon |
| 7/12/2017 | Malikowski | Heather | Exelon |
| 7/12/2017 | WILSON | BRYAN | WESTINGHOUSE ELECTRIC |
| 7/12/2017 | Burke | Mike | Westinghouse |
| 7/12/2017 | McFadden | John | Westinghouse |
| 7/12/2017 | KELLEY | CHRISTOPHER | Exelon |
| 7/12/2017 | SISK | ROB | Westinghouse |
| 7/12/2017 | Monahan | Jill | Westinghouse |
| 7/13/2017 | BRENNAN | JAMES | Westinghouse |
| 7/13/2017 | BRENNAN | JAMES | Westinghouse |
| 7/13/2017 | Reddick | Darani | Exelon |
| 7/13/2017 | Jury | Keith | Exelon |
| 7/13/2017 | WILSON | BRYAN | Westinghouse |
| 7/13/2017 | McFadden | John | Westinghouse |
| 7/13/2017 | Malikowski | Heather | Exelon |
| 7/13/2017 | Burke | Mike | Westinghouse |
| 7/13/2017 | Monahan | Jill | Westinghouse |
| 7/13/2017 | SISK | ROB | Westinghouse |
| 7/17/2017 | Weaver | Doug | WESTINGHOUSE ELECTRIC |
| 7/17/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC |
| 7/21/2017 | WEAVER | DOUG | Westinghouse |
| 7/26/2017 | AMWAY | PHIL | Exelon |
| 7/27/2017 | Inch | George | Exelon |
| 7/27/2017 | Naron | Larry | Exelon |
| 7/27/2017 | Hanley | Tim | Exelon |

| | | | |
|-----------|---------------|-------------|-----------------------------------|
| 7/31/2017 | weber | Chad | Westinghouse |
| 7/31/2017 | Runyan | Tom | Westinghouse Electric Company LLC |
| 7/6/2017 | Grobe | JACK | Exelon |
| 8/1/2017 | weber | Chad | Westinghouse |
| 8/1/2017 | Runyan | thomas | Westinghouse |
| 8/1/2017 | Runyan | thomas | Westinghouse |
| 8/10/2017 | Kuylar | Ray | Westinghouse Electric Company |
| 8/11/2017 | Maioli | Andrea | Westinghouse Electric Company |
| 8/15/2017 | ROBBINS | KIRK | EXELON |
| 8/15/2017 | Weaver | Douglas | Westinghouse |
| 8/15/2017 | TAYLOR | BRANDON | Westinghouse |
| 8/15/2017 | Phillips | Christopher | Westinghouse |
| 8/15/2017 | Paese | Richard | Westinghouse |
| 8/15/2017 | Odess-Gillett | Warren | Westinghouse |
| 8/16/2017 | Root | Kelly | Exelon |
| 8/16/2017 | Martin | Rebecca | Exelon |
| 8/16/2017 | Lyter | Jay | Exelon |
| 8/16/2017 | Amway | Phillip | Exelon |
| 8/16/2017 | Villar | Enrique | Exelon Generation Co LLC |
| 8/16/2017 | Federline | Eric | Exelon Generation Co LLC |
| 8/16/2017 | BECK | Wally | Exelon |
| 8/16/2017 | Chizever | Jeff | Exelon Generation Co LLC |
| 8/16/2017 | Haydin | John | Exelon Generation Co LLC |
| 8/16/2017 | Drake | Andre | Exelon Generation Co LLC |
| 8/16/2017 | Sellers | Craig | Exelon Generation Co LLC |
| 8/17/2017 | Grobe | Jack | Exelon |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/21/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/21/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/22/2017 | McGillicuddy | Kailyn | Westinghouse |
| 8/22/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/22/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/23/2017 | WEAVER | DOUG | Westinghouse |
| 8/23/2017 | EASTERLING | RICK | Westinghouse |
| 8/23/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/23/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/24/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/24/2017 | Piha | Albert | Exelon |
| 8/24/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/25/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/25/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/3/2017 | Mayer | Mark | Exelon |
| 8/3/2017 | Altizer | Jack | Exelon |
| 8/3/2017 | Kelley | Christopher | Exelon |
| 8/3/2017 | weber | Chad | Westinghouse |
| 8/3/2017 | weber | Chad | Westinghouse |
| 8/30/2017 | WEAVER | DOUGLAS | Westinghouse |

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|-----------|---------|-------|-----------------------------------|
| 8/30/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY |
| 8/30/2017 | Whaley | Steve | Westinghouse |
| 8/30/2017 | SISK | ROB | Westinghouse |
| 8/4/2017 | Runyan | Tom | Westinghouse Electric Company LLC |
| 8/4/2017 | weber | Chad | Westinghouse |
| 8/7/2017 | McVey | Ed | EXELON |

Visitor Log for NRC HQ from February 1, 2017 to August 31, 2017

| Date Visit Logged | Last Name | First Name | Company |
|--------------------------|------------------|-------------------|-----------------------------------|
| 2/10/2017 | Jury | Keith | Exelon |
| 2/10/2017 | Greenlee | Scot | Exelon |
| 2/10/2017 | Fewell | Brad | Exelon |
| 2/10/2017 | Hanson | Bryan | Exelon |
| 2/10/2017 | Kelley | Chris | Exelon |
| 2/10/2017 | Karney | Mike | Exelon |
| 2/13/2017 | Reddick | Dariani | Exelon Corporation |
| 2/15/2017 | Krueger | Gregory | Exelon |
| 2/16/2017 | KREJCIE | JESSICA | Exelon |
| 2/16/2017 | REDDICK | DARANI | Exelon |
| 2/16/2017 | AMWAY | PHILLIP | Exelon |
| 2/16/2017 | Russ | Paul | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 2/17/2017 | REDDICK | DARANI | Exelon |
| 2/2/2017 | Harsch | Nathan | Westinghouse |
| 2/2/2017 | Zorzi | Julia | Westinghouse |
| 2/2/2017 | Monahan | Jill | Westinghouse |
| 2/21/2017 | Krueger | Greg | EXELON |
| 2/21/2017 | Greenlee | Scot | EXELON |
| 2/22/2017 | Weaver | Doug | Westinghouse |
| 2/22/2017 | Easterling | Rick | Westinghouse |
| 2/23/2017 | Weaver | Douglas | Westinghouse |
| 2/23/2017 | HAMILTON | STEVEN | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | WERNER | TARA | Westinghouse |
| 2/23/2017 | FERGUSON | JEFFERY | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | POPE | ANNETTE | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | GARNER | RONNIE | Westinghouse |
| 2/23/2017 | Wu | Si | Westinghouse |
| 2/23/2017 | WANK | ANDREW | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | PAESE | RICHARD | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | DITOMMASO | SARAH | WESTINGHOUSE ELECTRIC |
| 2/23/2017 | Friant | Carl | Exelon |
| 2/24/2017 | Lloyd | Timothy | Westinghouse |
| 2/24/2017 | Tsang | Irving | Westinghouse |
| 2/24/2017 | Sisk | Rob | Westinghouse |
| 2/27/2017 | Shockling | michael | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 2/27/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 2/27/2017 | Lenahan | Ryan | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 2/27/2017 | Kobelak | Jeffrey | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 2/28/2017 | KRUEGER | GREGORY | Exelon |
| 2/28/2017 | REDDICK | DARANI | Exelon |
| 2/28/2017 | Stilwell | Wes | Westinghouse |
| 2/28/2017 | Elias | Vince | Westinghouse |
| 2/28/2017 | Cirilli | James | Exelon |
| 2/28/2017 | Marlette | Steve | Westinghouse |
| 2/6/2017 | Nowinowski | Tony | Westinghouse |
| 2/6/2017 | Mirizio | Damian | Westinghouse |

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|-----------|------------|-------------|-----------------------------------|
| 2/6/2017 | Lucci | Melissa | Westinghouse |
| 2/6/2017 | Higby | Melinda | Westinghouse |
| 2/6/2017 | Baier | Susan | Westinghouse |
| 2/6/2017 | Becker | Thomas | Westinghouse |
| 2/6/2017 | Schneider | Raymond | Westinghouse |
| 2/6/2017 | LaPresti | Mike | Westinghouse |
| 2/6/2017 | Linthicum | Roy | Exelon |
| 2/6/2017 | Andrachek | James | Westinghouse |
| 2/8/2017 | Schrage | John | Exelon |
| 2/8/2017 | Andrachek | James | Westinghouse |
| 2/8/2017 | Sung | Yixing | Westinghouse |
| 2/8/2017 | Sisk | Rob | Westinghouse |
| 2/8/2017 | Connelly | John | Exelon |
| 2/9/2017 | LeRoy | Peter | Westinghouse |
| 2/9/2017 | Harper | Zach | Westinghouse |
| 2/9/2017 | Sung | Yixing | Westinghouse |
| 2/9/2017 | Sung | Yixing | Westinghouse |
| 2/9/2017 | Sisk | Rob | Westinghouse |
| 2/9/2017 | Sisk | Rob | Westinghouse |
| 2/9/2017 | Connelly | John | Exelon |
| 3/13/2017 | KRUEGER | GREGORY | Exelon |
| 3/13/2017 | SCOTT | OWEN | Exelon |
| 3/13/2017 | ANEES | FARRUK | Exelon |
| 3/13/2017 | POURNIA | FARAMA | Exelon |
| 3/13/2017 | COKER | MICHAEL | Exelon |
| 3/13/2017 | LINTHICUM | ROY | Exelon |
| 3/15/2017 | reddick | darani | Exelon |
| 3/16/2017 | amway | phillip | Exelon |
| 3/16/2017 | Henry | Douglas | Westinghouse Electric Company |
| 3/17/2017 | Grobe | Jack | Exelon |
| 3/2/2017 | KARNEY | MICHAEL | Exelon |
| 3/2/2017 | MUDRICK | CHRISTOPHER | Exelon |
| 3/2/2017 | KELLEY | CHRISOPHER | Exelon |
| 3/2/2017 | WEAVER | DOUGLAS | Westinghouse |
| 3/20/2017 | Weaver | Doug | Westinghouse |
| 3/20/2017 | Easterling | Rick | Westinghouse |
| 3/21/2017 | SISK | ROBERT | Westinghouse |
| 3/21/2017 | MONAHAN | JILL | Westinghouse |
| 3/21/2017 | KELLEY | Chris | Exelon |
| 3/21/2017 | Karney | Mike | Exelon |
| 3/23/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 3/23/2017 | hilditch | john | Exelon |
| 3/23/2017 | hufnagel | john | Exelon |
| 3/23/2017 | DEGONISH | MATTHEW | Westinghouse |
| 3/23/2017 | LAPRESTI | MICHAEL | WESTINGHOUSE ELECTRIC |
| 3/23/2017 | LeRoy | PETER | Westinghouse |
| 3/23/2017 | ANDRACHEK | JAMES | WESTINGHOUSE ELECTRIC |
| 3/23/2017 | Harper | Zach | Westinghouse |
| 3/23/2017 | GALLAGHER | Michael | Exelon |

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|-----------|------------|-------------|-----------------------------------|
| 3/23/2017 | Semmler | Mike | Westinghouse |
| 3/23/2017 | Jury | Keith | Exelon |
| 3/23/2017 | Linthicum | Roy | Exelon |
| 3/23/2017 | Gaston | Ron | Exelon |
| 3/23/2017 | Reddick | Darani | Exelon |
| 3/23/2017 | Landale | Jim | Exelon |
| 3/27/2017 | Kelly | Christopher | Exelon |
| 3/27/2017 | Karney | Michael | Exelon |
| 3/27/2017 | Svaleson | Robert | Exelon |
| 3/27/2017 | Brooks | Benjamin | Exelon |
| 3/28/2017 | Wilson | Brian | Westinghouse |
| 3/28/2017 | Molkenthin | James | Westinghouse |
| 3/28/2017 | McFadden | John | Westinghouse |
| 3/28/2017 | Molkenthin | James | Westinghouse |
| 3/28/2017 | Malikowski | Heather | EXELON |
| 3/28/2017 | Andracheck | James | Westinghouse |
| 3/28/2017 | Cavedo | Rob | Exelon |
| 3/29/2017 | Grobe | John | Exelon |
| 3/6/2017 | Weaver | Douglas | Westinghouse Electric Company |
| 3/6/2017 | Howell | David | Westinghouse Electric Company |
| 3/6/2017 | Howell | David | Westinghouse Electric Company |
| 3/6/2017 | Brennan | James | Westinghouse Electric Company |
| 3/6/2017 | Rodack | Thomas | Exelon |
| 3/6/2017 | Basehore | Kerry | Exelon |
| 3/6/2017 | Bauer | Joseph | Exelon |
| 3/6/2017 | Wengloski | Philip | Exelon |
| 3/6/2017 | Stevens | Tyrone | Exelon |
| 3/6/2017 | Chizhevsky | Michael | Exelon |
| 3/6/2017 | Close | Robert | Exelon |
| 3/7/2017 | Alpan | Arzu | Westinghouse |
| 3/8/2017 | Monahan | Jill | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 3/8/2017 | Sisk | Robert | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 3/9/2017 | Wenner | Mike | Westinghouse |
| 3/9/2017 | Sipes | Doug | Westinghouse |
| 3/9/2017 | Blanco | Andrew | Westinghouse |
| 4/10/2017 | Grobmyer | LOU | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/10/2017 | Sebastiani | PATRICK | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/10/2017 | Prible | MICHAEL | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/10/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/11/2017 | Bonadio | Kent | Westinghouse |
| 4/11/2017 | Andracheck | Jim | Westinghouse |
| 4/12/2017 | Elias | Vince | Westinghouse |
| 4/12/2017 | mcfadden | John | Westinghouse |
| 4/12/2017 | mcfadden | John | Westinghouse |
| 4/12/2017 | McKinley | J. | Westinghouse |
| 4/18/2017 | Weaver | Doug | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/18/2017 | MONAHAN | JILL | Westinghouse |
| 4/18/2017 | Sisk | Robert | WESTINGHOUSE ELECTRIC |
| 4/19/2017 | Karoutas | Zeses | WESTINGHOUSE ELECTRIC COMPANY LLC |

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| 4/19/2017 | BEEBE | BRIAN | Westinghouse |
| 4/19/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 4/19/2017 | SCHNDER | RAYMOND | Westinghouse |
| 4/19/2017 | Monahan | JILL | Westinghouse |
| 4/19/2017 | Sisk | ROB | Westinghouse |
| 4/20/2017 | SCHNEIDER | RAYMOND | Westinghouse |
| 4/20/2017 | Monahan | JILL | Westinghouse |
| 4/20/2017 | Shneider | Raymond | Westinghouse |
| 4/20/2017 | Monahan | JILL | Westinghouse |
| 4/20/2017 | Sisk | ROB | Westinghouse |
| 4/20/2017 | Sisk | ROB | Westinghouse |
| 4/20/2017 | levandoski | kenneth | Exelon |
| 4/20/2017 | levandoski | kenneth | Exelon |
| 4/20/2017 | levandoski | kenneth | Exelon |
| 4/20/2017 | KRUEGER | GREGORY | Exelon |
| 4/20/2017 | KRUEGER | GREGORY | Exelon |
| 4/20/2017 | KELLEY | CHRISTOPHER | Exelon |
| 4/20/2017 | KELLEY | CHRISTOPHER | Exelon |
| 4/24/2017 | DiTommaso | Sarah | Westinghouse |
| 4/24/2017 | LeRoy | Peter | Westinghouse |
| 4/26/2017 | Gallagher | Michael | Exelon Generation Co. |
| 4/27/2017 | SISK | ROBERT | Westinghouse |
| 4/5/2017 | Sisk | Rob | Westinghouse |
| 4/6/2017 | HILDITCH | JOHN | EXELON |
| 4/6/2017 | HILDITCH | JOHN | EXELON |
| 4/6/2017 | SISK | ROBERT | Westinghouse |
| 5/10/2017 | uzman | murat | Westinghouse |
| 5/11/2017 | uzman | murat | Westinghouse |
| 5/11/2017 | REDDICK | DARANI | Exelon |
| 5/11/2017 | Greenlee | Scott | Exelon Nuclear |
| 5/11/2017 | GUDGER | DAVID | Exelon |
| 5/11/2017 | Greenlee | Scott | Exelon Nuclear |
| 5/11/2017 | Gallagher | Mike | Exelon |
| 5/11/2017 | PIHA | Albert | Exelon |
| 5/11/2017 | Hufnagel | John | Exelon |
| 5/15/2017 | GROBE | JOHN | Exelon |
| 5/16/2017 | kelly | eugene | Exelon |
| 5/16/2017 | stone | jeffrey | Exelon |
| 5/16/2017 | Atwood | Andrew | Westinghouse |
| 5/16/2017 | KERSTING | PAUL | Westinghouse |
| 5/16/2017 | Long | Yun | Westinghouse |
| 5/16/2017 | BOYLE | JAMES | Westinghouse |
| 5/16/2017 | LENAHAN | RYAN | WESTINGHOUSE ELECTRIC COMPANY LLC |
| 5/16/2017 | Linsuain | Otto | Westinghouse |
| 5/16/2017 | Mercier | Edmond | Westinghouse |
| 5/16/2017 | Andrecheck | Jim | Westinghouse |
| 5/16/2017 | Linthicum | Roy | Exelon |
| 5/16/2017 | Stewart | Glen | Exelon |
| 5/16/2017 | Warren | Vicki | Exelon |

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|-----------|---------------|---------|--------------|
| 5/17/2017 | CONNELLY | JOHN | Exelon |
| 5/17/2017 | Kelley | Chris | Exelon |
| 5/18/2017 | Reddick | Darani | Exelon |
| 5/18/2017 | Landale | James | Exelon |
| 5/18/2017 | Gaston | Ron | Exelon |
| 5/18/2017 | Sisk | Rob | Westinghouse |
| 5/19/2017 | Monahan | Jill | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/19/2017 | Lee | Naugab | Westinghouse |
| 5/19/2017 | Sisk | Rob | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/19/2017 | Atkins | Douglas | Westinghouse |
| 5/2/2017 | Reddick | Darani | Exelon |
| 5/2/2017 | Kelly | Eugene | Exelon |
| 5/2/2017 | Stone | Jeff | Exelon |
| 5/2/2017 | Barstow | Jim | Exelon |
| 5/22/2017 | MOLKENTHIN | JAMES | Westinghouse |
| 5/22/2017 | DEVAN | MATTHEW | Westinghouse |
| 5/22/2017 | Malikowski | Heather | Exelon |
| 5/22/2017 | Hall | Brian | Westinghouse |
| 5/22/2017 | Shakun | Matthew | Westinghouse |
| 5/22/2017 | Odess-Gillett | Warren | Westinghouse |
| 5/22/2017 | WEBB | JUSTIN | WESTINGHOUSE |
| 5/22/2017 | ANDRACHEK | JAMES | Westinghouse |
| 5/22/2017 | Costantino | Roger | Westinghouse |
| 5/22/2017 | Jarosh | David | Westinghouse |
| 5/23/2017 | Burke | Michael | Westinghouse |
| 5/23/2017 | Molkenthin | Jim | Westinghouse |
| 5/23/2017 | Molkenthin | Jim | Westinghouse |
| 5/23/2017 | Odell | Andrew | Exelon |
| 5/23/2017 | malikowski | heather | Exelon |
| 5/24/2017 | Weaver | Doug | Westinghouse |
| 5/24/2017 | Burke | Michael | Westinghouse |
| 5/24/2017 | Burke | Michael | Westinghouse |
| 5/24/2017 | Burke | Michael | Westinghouse |
| 5/24/2017 | Burke | Michael | Westinghouse |
| 5/24/2017 | Molkenthin | Jim | Westinghouse |
| 5/24/2017 | malikowski | heather | Exelon |
| 5/24/2017 | Odell | Andrew | Exelon |
| 5/25/2017 | Bashor | John | Exelon |
| 5/25/2017 | SPRENGEL | RYAN | Exelon |
| 5/25/2017 | Gullott | David | Exelon |
| 5/25/2017 | malikowski | heather | Exelon |
| 5/25/2017 | Odell | Andrew | Exelon |
| 5/25/2017 | malikowski | heather | Exelon |
| 5/25/2017 | malikowski | heather | Exelon |

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|-----------|--------------|---------|-----------------------|
| 5/25/2017 | malikowski | heather | Exelon |
| 5/25/2017 | malikowski | heather | Exelon |
| 5/25/2017 | malikowski | heather | Exelon |
| 5/4/2017 | Lopatto | Jeanne | Westinghouse |
| 5/4/2017 | Weaver | Douglas | Westinghouse |
| 5/4/2017 | KRUEGER | GREGORY | Exelon |
| 5/8/2017 | Moorehead | John | Westinghouse |
| 5/8/2017 | Moorehead | John | Westinghouse |
| 5/9/2017 | Moorehead | John | Westinghouse |
| 5/9/2017 | Sisk | Robert | Westinghouse |
| 6/1/2017 | AMWAY | PHIL | EXELON |
| 6/1/2017 | Grobe | John | Exelon |
| 6/13/2017 | KUYLER | RAPHAEL | Westinghouse |
| 6/15/2017 | KUYLER | RAPHAEL | Westinghouse |
| 6/15/2017 | Zozula | Camille | Westinghouse |
| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | Maguire | Amanda | WESTINGHOUSE ELECTRIC |
| 6/15/2017 | Annacone | Mike | Westinghouse |
| 6/15/2017 | Parr | Nancy | Westinghouse |
| 6/15/2017 | Weaver | Doug | Westinghouse |
| 6/15/2017 | Maguire | Amanda | Westinghouse |
| 6/15/2017 | Maguire | Amanda | Westinghouse |
| 6/15/2017 | Zozula | Camille | Westinghouse |
| 6/15/2017 | Parr | Nancy | Westinghouse |
| 6/15/2017 | Weaver | Doug | Westinghouse |
| 6/15/2017 | Annacone | Mike | Westinghouse |
| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | Maguire | Amanda | Westinghouse |
| 6/15/2017 | Zozula | Camille | Westinghouse |
| 6/15/2017 | Parr | Nancy | Westinghouse |
| 6/15/2017 | Weaver | Doug | Westinghouse |
| 6/15/2017 | Annacone | Mike | Westinghouse |
| 6/15/2017 | DeWitt | Michele | Westinghouse |
| 6/15/2017 | Mascitelli | Frank | Exelon |
| 6/2/2017 | Barstow | James | EXELON |
| 6/2/2017 | Grobe | JOHN | EXELON |
| 6/20/2017 | Greenlee | Scot | Exelon |
| 6/20/2017 | Odell | Drew | Exelon |
| 6/20/2017 | SISK | ROB | WESTINGHOUSE |
| 6/20/2017 | ODESS-GILLET | WARREN | WESTINGHOUSE |
| 6/21/2017 | LINTHICUM | ROY | Exelon |
| 6/21/2017 | ODESS-GILLET | WARREN | WESTINGHOUSE |
| 6/21/2017 | SISK | ROB | WESTINGHOUSE |
| 6/22/2017 | McGillicuddy | Kailyn | Westinghouse |
| 6/29/2017 | Neckowicz | Ted | Exelon |
| 6/29/2017 | Basso | Tom | Exelon |
| 6/29/2017 | DiRado | Mark | Exelon |
| 6/29/2017 | Greenlee | Scot | Exelon |

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|-----------|------------|-------------|-----------------------|
| 6/29/2017 | Weaver | Douglas | Westinghouse |
| 6/30/2017 | Sleigh | Mike | Westinghouse |
| 6/30/2017 | Kostelnik | JOHN | Westinghouse |
| 6/30/2017 | Reed | Steve | Westinghouse |
| 6/5/2017 | SISK | ROBERT | Westinghouse |
| 6/6/2017 | Linthicum | Roy | Exelon |
| 6/6/2017 | Cavedo | Rob | Exelon |
| 6/6/2017 | Gudger | David | Exelon |
| 6/6/2017 | Doran | Dan | Exelon |
| 6/7/2017 | Jean | Uldrick | EXELON |
| 6/7/2017 | Schade | Eric | EXELON |
| 6/7/2017 | SISK | ROB | Westinghouse |
| 6/8/2017 | Connelly | John | Exelon |
| 6/8/2017 | DOHSE | SCOTT | EXELON |
| 6/8/2017 | ALTIZER | JACK | EXELON |
| 6/9/2017 | Fewell | Brad | Exelon |
| 6/9/2017 | Fewell | Brad | Exelon |
| 6/9/2017 | Greenlee | Scot | Exelon |
| 6/9/2017 | Hanson | Bryan | Exelon |
| 6/9/2017 | Mudrick | Chris | EXELON |
| 7/12/2017 | long | yun | Westinghouse |
| 7/12/2017 | mcdaniel | zachary | Westinghouse |
| 7/12/2017 | kersting | paul | Westinghouse |
| 7/12/2017 | mercier | edmond | Westinghouse |
| 7/12/2017 | Malikowski | Heather | Exelon |
| 7/12/2017 | Malikowski | Heather | Exelon |
| 7/12/2017 | WILSON | BRYAN | WESTINGHOUSE ELECTRIC |
| 7/12/2017 | Burke | Mike | Westinghouse |
| 7/12/2017 | McFadden | John | Westinghouse |
| 7/12/2017 | KELLEY | CHRISTOPHER | Exelon |
| 7/12/2017 | SISK | ROB | Westinghouse |
| 7/12/2017 | Monahan | Jill | Westinghouse |
| 7/13/2017 | BRENNAN | JAMES | Westinghouse |
| 7/13/2017 | BRENNAN | JAMES | Westinghouse |
| 7/13/2017 | Reddick | Darani | Exelon |
| 7/13/2017 | Jury | Keith | Exelon |
| 7/13/2017 | WILSON | BRYAN | Westinghouse |
| 7/13/2017 | McFadden | John | Westinghouse |
| 7/13/2017 | Malikowski | Heather | Exelon |
| 7/13/2017 | Burke | Mike | Westinghouse |
| 7/13/2017 | Monahan | Jill | Westinghouse |
| 7/13/2017 | SISK | ROB | Westinghouse |
| 7/17/2017 | Weaver | Doug | WESTINGHOUSE ELECTRIC |
| 7/17/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC |
| 7/21/2017 | WEAVER | DOUG | Westinghouse |
| 7/26/2017 | AMWAY | PHIL | Exelon |
| 7/27/2017 | Inch | George | Exelon |
| 7/27/2017 | Naron | Larry | Exelon |
| 7/27/2017 | Hanley | Tim | Exelon |

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|-----------|---------------|-------------|-----------------------------------|
| 7/31/2017 | weber | Chad | Westinghouse |
| 7/31/2017 | Runyan | Tom | Westinghouse Electric Company LLC |
| 7/6/2017 | Grobe | JACK | Exelon |
| 8/1/2017 | weber | Chad | Westinghouse |
| 8/1/2017 | Runyan | thomas | Westinghouse |
| 8/1/2017 | Runyan | thomas | Westinghouse |
| 8/10/2017 | Kuylar | Ray | Westinghouse Electric Company |
| 8/11/2017 | Maioli | Andrea | Westinghouse Electric Company |
| 8/15/2017 | ROBBINS | KIRK | EXELON |
| 8/15/2017 | Weaver | Douglas | Westinghouse |
| 8/15/2017 | TAYLOR | BRANDON | Westinghouse |
| 8/15/2017 | Phillips | Christopher | Westinghouse |
| 8/15/2017 | Paese | Richard | Westinghouse |
| 8/15/2017 | Odess-Gillett | Warren | Westinghouse |
| 8/16/2017 | Root | Kelly | Exelon |
| 8/16/2017 | Martin | Rebecca | Exelon |
| 8/16/2017 | Lyter | Jay | Exelon |
| 8/16/2017 | Amway | Phillip | Exelon |
| 8/16/2017 | Villar | Enrique | Exelon Generation Co LLC |
| 8/16/2017 | Federline | Eric | Exelon Generation Co LLC |
| 8/16/2017 | BECK | Wally | Exelon |
| 8/16/2017 | Chizever | Jeff | Exelon Generation Co LLC |
| 8/16/2017 | Haydin | John | Exelon Generation Co LLC |
| 8/16/2017 | Drake | Andre | Exelon Generation Co LLC |
| 8/16/2017 | Sellers | Craig | Exelon Generation Co LLC |
| 8/17/2017 | Grobe | Jack | Exelon |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/2/2017 | weber | Chad | Westinghouse |
| 8/21/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/21/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/22/2017 | McGillicuddy | Kailyn | Westinghouse |
| 8/22/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/22/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/23/2017 | WEAVER | DOUG | Westinghouse |
| 8/23/2017 | EASTERLING | RICK | Westinghouse |
| 8/23/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/23/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/24/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/24/2017 | Piha | Albert | Exelon |
| 8/24/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/25/2017 | Pringle | Patricia | Exelon Generation, LLC |
| 8/25/2017 | Spath | Sarah | Exelon Generation, LLC |
| 8/3/2017 | Mayer | Mark | Exelon |
| 8/3/2017 | Altizer | Jack | Exelon |
| 8/3/2017 | Kelley | Christopher | Exelon |
| 8/3/2017 | weber | Chad | Westinghouse |
| 8/3/2017 | weber | Chad | Westinghouse |
| 8/30/2017 | WEAVER | DOUGLAS | Westinghouse |

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|-----------|---------|-------|-----------------------------------|
| 8/30/2017 | Mercier | Ed | WESTINGHOUSE ELECTRIC COMPANY |
| 8/30/2017 | Whaley | Steve | Westinghouse |
| 8/30/2017 | SISK | ROB | Westinghouse |
| 8/4/2017 | Runyan | Tom | Westinghouse Electric Company LLC |
| 8/4/2017 | weber | Chad | Westinghouse |
| 8/7/2017 | McVey | Ed | EXELON |