

# **Exelon Generation Appeal of Backfit Determination Regarding Braidwood and Byron Compliance with GDCs 15, 21, 29, and 10 CFR § 50.34(b)**

**NRC/Exelon Meeting, Rockville, MD**

**March 7, 2016**



**Exelon Generation®**

# Agenda

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- Introductions and Opening Remarks
- EGC Backfit Appeal
- Issue Overview
- Backfit Rule & Compliance Exception
- Compliance Exception Is Not Justified
- Conclusion

# EGC Backfit Appeal

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- NRC has not satisfied the legal standard to invoke the compliance exception to the backfit rule
- Therefore, NRC must conduct a backfit analysis demonstrating that the backfit would result in a cost-justified, substantial safety enhancement before imposing the backfit

# Issue Overview

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- NRC imposed a compliance backfit regarding:
  - 10 CFR 50, Appendix A, General Design Criteria 15, 21, 29
  - 10 CFR 50.34(b), "Final safety analysis report"
  - Plant-specific licensing basis prohibiting progression of Condition II events
- NRC's Backfit Evaluation concludes:
  - The UFSAR predicts water relief through a valve that is not qualified for water relief
  - The UFSAR does not contain analyses demonstrating that structures, systems, and components will meet the design criteria for Condition II faults as stated in the Braidwood and Byron UFSAR
- NRC acknowledges that its conclusions regarding non-compliance differ from previous NRC positions - therefore, the current NRC position constitutes a backfit

# Issue Overview

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- Byron and Braidwood continue to operate safely
  - UFSAR conclusion that significant dose consequence margin exists continues to be supported and justified
  - Design and operations continue to employ a defense-in-depth approach
  - Operation and analyses continue to be in accordance with the NRC approved licensing and design bases
  - Issue presented in Backfit Evaluation is not a substantial safety hazard or matter of adequate protection

# Backfit Rule

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- A "backfit" is "the modification of or addition to systems, structures, components, or design of a facility ... which may result from a new or amended provision in the Commission's regulations or the imposition of a regulatory staff position interpreting the Commission's regulations that is either new or different from a previously applicable staff position..."  
(10 CFR 50.109(a)(1) (emphasis added))
- NRC must prepare "a systematic and documented analysis...for backfits which it seeks to impose" unless a backfit exception applies  
(10 CFR 50.109(a)(2))
- NRC can only impose a backfit after determining that the backfit would lead to a cost-justified, substantial increase in overall safety  
(10 CFR 50.109(a)(3))
- Staff determined that although it was imposing a backfit, no backfit analysis was required under the compliance exception

# Compliance Exception to Backfit Rule

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- NRC may forego a backfit analysis when "necessary to bring a facility into compliance with a license or the rules or orders of the Commission, or into conformance with written commitments by the licensee." (10 CFR 50.109(a)(4)(i))
- Commission explanation of the compliance exception is clearly articulated in the Backfit Rule Statements of Consideration and reiterated in NUREG-1409:
  - "to address situations in which the licensee has failed to meet known and established standards of the Commission because of omission or mistake of fact. It should be noted that new or modified interpretations of what constitutes compliance would not fall within the exception and would require a backfit analysis and application of the standard" 50 Fed. Reg. 38,097, 38,103; NUREG-1409, p. 12 (emphasis added).

# Compliance Exception is Not Justified

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- Backfit Evaluation does not identify the necessary element for reliance on the compliance exception: an omission or mistake of fact in prior NRC approvals
  - NRC states only that prior acceptance was based on water-qualified PSVs that "...upon further review...was found to be unsubstantiated"
  - No explanation of how or why conclusion is "unsubstantiated "
  - No explanation of how the "unsubstantiated" conclusion is an omission or mistake of fact
  - No explanation of how the "unsubstantiated" conclusion undermines prior NRC approvals

# Compliance Exception is Not Justified

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- NRC previously reviewed and approved the current UFSAR analyses and supporting conclusions multiple times
  - 2001 Power Uprate Approval – Staff found crediting the PSVs to discharge liquid water during the IOECCS event is acceptable
  - 2004 PSV Setpoint Amendment Approval – Staff concluded the PSVs will remain operable following an IOECCS event
  - NRC endorsement of EPRI PSV and PORV qualification program (TER on NUREG-0737 Item II.D.1 – 1988 (Byron), 1990 (Braidwood))
  - 1982 SER NUREG-0876 – fuel damage and primary pressure limits evaluated

Year	Submittal	Prior NRC Review	NRC Staff Conclusions
2001	Power Uprate (5% Stretch)	The NRC stated that the "staff has generally not accepted a solid pressurizer for this accident in order to avoid the potential for all three pressurizer safety valves to be stuck open (a SBLOCA) due to liquid relief through these safety valves." <sup>3</sup> EGC provided details of EPRI test program and its applicability to the spurious SI event at Braidwood and Byron and concluded that the valves would be capable of closing in response to system depressurization following water relief.	Water relief was credited through the safety valves and the staff concluded, "The staff finds the licensee's crediting of the PSVs to discharge water during the spurious SI event to be acceptable." <sup>4</sup>
2004	Pressurizer Safety Valve Setpoint Amendment	NRC requested Exelon to quantify the effect of the lower PSV setpoint (as requested as part of LAR) on the AOR for the limiting spurious SI at power event. An evaluation demonstrated that the discharge water temperature of the spurious SI event was significantly higher than the discharge water temperature used to support operability of the PSVs. EGC stated, "Therefore, the spurious SI transient does not progress into higher condition transient (i.e., a Condition III loss of coolant accident) consistent with the conclusions of the existing evaluation. " <sup>1</sup>	The staff concluded "...the calculated PSV operating conditions did not exceed the AOR PSV operability range previously approved by the staff, the staff concludes that the reanalyses are acceptable." <sup>2</sup> No change to UFSAR evaluation or conclusions (2001 analysis).
1988 (BYR) 1990 (BRW)	NUREG 0737, Item II.D.1, Relief and Safety Valve Test Requirements	Exelon provided details of qualification test results from EPRI tests on safety valves, PORVs and PORV block valves and indicated they would be adequate to perform the required water relief function under certain conditions. Additionally, it was noted by NRC staff that meeting the licensing requirements of 10 CFR 50.49 for this electrical equipment is satisfactory and that CEC Co (Comed) included the PORV controls in the 10 CFR 50.49 program, "thereby ensuring that the control circuitry will function properly. " <sup>5</sup>	EPRI tests cited in TER qualified the pressurizer safety, PORVs and PORV block valves for water relief under certain conditions.
1982	Original SER	In accordance with the NUREG-0800, EGC provided results of inadvertent ECCS analysis confirming that the reactor pressure never exceeds design values and DNBR limits were met.	NRC staff concluded, "The staff finds the results of these transients acceptable because the fuel damage limits and the primary system pressure limits are not violated." <sup>6</sup>

# Compliance Exception is Not Justified

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- NRC’s prior reviews explicitly questioned PSV qualifications, water relief during IOECCS, and AOOs remaining Condition II events
  - Each time, NRC accepted EGC’s analyses and approved the license amendments
- However the Backfit Evaluation does not identify any omission or mistake of fact in those prior approvals
- Therefore, use of the compliance exception is not justified

# Conclusion

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- NRC has not met the requirements to invoke the compliance exception to the backfit rule; the exception does not apply
  - Prior NRC reviews of valve qualification/operability and UFSAR analyses were comprehensive and determined to be acceptable
  - Backfit Evaluation has not identified any omission or mistake of fact in prior NRC approvals necessary to rely on the compliance exception
- Therefore, NRC must perform a backfit analysis
- NRC may not impose the backfit unless the action would lead to a substantial increase in overall protection of public health and safety or common defense and security, and even then, only if the backfit is cost-justified

# References

1. Letter from K. A. Ainger (Exelon) to NRC, "Request for Additional Information Regarding a License Amendment Request to Revise the Pressurizer Safety Valves Lift Setting," dated January 29, 2004
2. Letter from G. F. Dick (NRC) to C. M. Crane (EGC), "Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 - Issuance of Amendments; RE: Pressurizer Safety Valve Setpoints," dated August 26, 2004
3. Letter from R. M. Krich (ComEd) to NRC, "Response to Request for Additional Information Regarding the License Amendment Request to Permit Up-rated Power Operations at Byron and Braidwood Stations," dated November 27, 2000
4. Letter from G. F. Dick (NRC) to O.D. Kingsley, "Issuance of Amendments; Increase in Reactor Power; Byron Station, Units 1 and 2 and Braidwood Station Units 1 and 2," dated May 4, 2001
5. Letter from L. N. Olshan (NRC) to H. E. Bliss (ComEd), "NUREG 0737, Item II.D.1, Performance Testing on Relief and Safety Valves for Byron Station, Units 1 and 2," dated August 18, 1988
6. NUREG-0876, Supplement 5, "Safety Evaluation Report Related to the Operation of Byron Station Units 1 and 2," dated October 1984; NUREG-1002, Supplement 1, "Safety Evaluation Report Related to the Operation of Braidwood Station Units 1 and 2," dated September 1986

# Glossary

- AOO: Anticipated Operational Occurrence
- EPRI: Electric Power Research Institute
- EGC: Exelon Generation Company
- GDC: General Design Criterion
- IOECCS: Inadvertent Operation of Emergency Core Cooling System
- PORV: Power-Operated Relief Valve
- PSV: Pressurizer Safety Valve
- SER: Safety Evaluation Report
- TER: Technical Evaluation Report
- UFSAR: Updated Final Safety Analysis Report