

**RESPONSE TO FREEDOM OF
INFORMATION ACT (FOIA) / PRIVACY
ACT (PA) REQUEST**

2015-0445

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RESPONSE TYPE INTERIM FINAL

REQUESTER
David Lochbaum

DATE
September 24, 2015

PART I. -- INFORMATION RELEASED

- No additional agency records subject to the request have been located.
- Requested records are available through another public distribution program. See Comments section.
- Agency records subject to the request that are identified in the specified group are already available in public ADAMS or on microfiche in the NRC Public Document Room.
- Agency records subject to the request that are contained in the specified group are being made available in public ADAMS.
- Agency records subject to the request are enclosed.
- Records subject to the request that contain information originated by or of interest to another Federal agency have been referred to that agency (see comments section) for a disclosure determination and direct response to you.
- We are continuing to process your request.
- See Comments.

PART I.A -- FEES

- AMOUNT* You will be billed by NRC for the amount listed. None. Minimum fee threshold not met.
- * See comments for details You will receive a refund for the amount listed. Fees waived.

PART I.B -- INFORMATION NOT LOCATED OR WITHHELD FROM DISCLOSURE

- We did not locate any agency records responsive to your request. *Note:* Congress allowed agencies to treat three discrete categories of law enforcement and national security records as not subject to the FOIA ("exclusions"). See 5 U.S.C. 552(c). This is a standard notification that we give to all requesters; it should not be taken as an indication that any of these excluded records do, or do not, exist.
 - We have withheld certain information in the records from disclosure pursuant to the FOIA exemptions described, and for the reasons stated, in Part II.
- Because this is an interim response to your request, you may not appeal this determination at this time. We will notify you of your right to appeal any of the responses we have issued in response to your request when we issue our final determination on your request.
- You may appeal this final determination within 30 calendar days of the date of this response, by writing to the FOIA Officer, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001. Please be sure to mark your letter/envelope or email that it is a "FOIA Appeal."

PART I.C COMMENTS (Use attached Comments continuation page if required)

This incoming FOIA request will be available in ADAMS at ML15225A070.

SIGNATURE - FREEDOM OF INFORMATION ACT AND PRIVACY ACT OFFICER

Roger D. Andoh



RESPONSE TO FREEDOM OF INFORMATION ACT (FOIA) / PRIVACY ACT (PA) REQUEST

DATE

09/24/2015

PART II.A -- APPLICABLE EXEMPTIONS

GROUP

Records subject to the request that are contained in the specified group are being withheld in their entirety or in part under the Exemption No.(s) of the PA and/or the FOIA as indicated below (5 U.S.C. 552a and/or 5 U.S.C. 552(b)).

- Exemption 1: The withheld information is properly classified pursuant to Executive Order 12958.
- Exemption 2: The withheld information relates solely to the internal personnel rules and practices of NRC.
- Exemption 3: The withheld information is specifically exempted from public disclosure by statute indicated.
 - Sections 141-145 of the Atomic Energy Act, which prohibits the disclosure of Restricted Data or Formerly Restricted Data (42 U.S.C. 2161-2165).
 - Section 147 of the Atomic Energy Act, which prohibits the disclosure of Unclassified Safeguards Information (42 U.S.C. 2167).
 - 41 U.S.C., Section 4702(b), prohibits the disclosure of contractor proposals in the possession and control of an executive agency to any person under section 552 of Title 5, U.S.C. (the FOIA), except when incorporated into the contract between the agency and the submitter of the proposal.
- Exemption 4: The withheld information is a trade secret or commercial or financial information that is being withheld for the reason(s) indicated.
 - The information is considered to be confidential business (proprietary) information.
 - The information is considered to be proprietary because it concerns a licensee's or applicant's physical protection or material control and accounting program for special nuclear material pursuant to 10 CFR 2.390(d)(1).
 - The information was submitted by a foreign source and received in confidence pursuant to 10 CFR 2.390(d)(2).
 - Disclosure will harm an identifiable private or governmental interest.
- Exemption 5: The withheld information consists of interagency or intraagency records that are not available through discovery during litigation. Applicable privileges:
 - Deliberative process: Disclosure of predecisional information would tend to inhibit the open and frank exchange of ideas essential to the deliberative process. Where records are withheld in their entirety, the facts are inextricably intertwined with the predecisional information. There also are no reasonably segregable factual portions because the release of the facts would permit an indirect inquiry into the predecisional process of the agency.
 - Attorney work-product privilege. (Documents prepared by an attorney in contemplation of litigation)
 - Attorney-client privilege. (Confidential communications between an attorney and his/her client)
- Exemption 6: The withheld information is exempted from public disclosure because its disclosure would result in a clearly unwarranted invasion of personal privacy.
- Exemption 7: The withheld information consists of records compiled for law enforcement purposes and is being withheld for the reason(s) indicated.
 - (A) Disclosure could reasonably be expected to interfere with an enforcement proceeding (e.g., it would reveal the scope, direction, and focus of enforcement efforts, and thus could possibly allow recipients to take action to shield potential wrong doing or a violation of NRC requirements from investigators).
 - (C) Disclosure could constitute an unwarranted invasion of personal privacy.
 - (D) The information consists of names of individuals and other information the disclosure of which could reasonably be expected to reveal identities of confidential sources.
 - (E) Disclosure would reveal techniques and procedures for law enforcement investigations or prosecutions, or guidelines that could reasonably be expected to risk circumvention of the law.
 - (F) Disclosure could reasonably be expected to endanger the life or physical safety of an individual.
- OTHER (Specify)

PART II.B -- DENYING OFFICIALS

Pursuant to 10 CFR 9.25(g), 9.25(h), and/or 9.65(b) of the U.S. Nuclear Regulatory Commission regulations, it has been determined that the information withheld is exempt from production or disclosure, and that its production or disclosure is contrary to the public interest. The person responsible for the denial are those officials identified below as denying officials and the FOIA/PA Officer for any denials that may be appealed to the Executive Director for Operations (EDO).

DENYING OFFICIAL	TITLE/OFFICE	RECORDS DENIED	APPELLATE OFFICIAL		
			EDO	SECY	IG
Marc Dapas	Regional Administrator, RIV	04/10/15 White Paper	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appeal must be made in writing within 30 days of receipt of this response. Appeals should be mailed to the FOIA/Privacy Act Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, for action by the appropriate appellate official(s). You should clearly state on the envelope and letter that it is a "FOIA/PA Appeal."

Executive Summary

The purpose of this white paper is to explain simulator / plant differences that were observed post scram on 12/25/2014. This white paper will address the following three issues:

1. Two unexpected alarms on loss of Division II reactor Protection System (RPS) Power
2. Main Feedwater Regulating Valve Seat Leakage
3. Start-up Feedwater Regulating Valve Response

Post scram, it was believed that there existed some differences between simulator modeling and actual plant equipment performance. Upon further investigation, it has been determined that the simulator modeling and response is per the required industry standards with the exception of the two unexpected annunciators which were identified and documented via the simulator discrepancy process prior to the 12/25/2014 scram. For each of the items in question, this paper summarizes that Operator performance was not impacted by simulator modeling.

Unexpected Alarms on Loss of Division II RPS

Following the loss of Division II reactor Protection System (RPS) power and plant scram on 12/25/2014, the following two annunciators were received in the Main Control Room and noted by the Operators as not having been received in the simulator for the same loss of RPS power event:

- High Drywell Pressure
- RPV High Pressure

The Control Room team responded per plant procedures and verified drywell pressure and reactor pressure indications were as expected. Irrespective of whether these alarms were modeled in the simulator, the response to validate the alarms in the plant would have been the same. This condition did not impact Operator performance, as the Operators are expected to address and validate all received alarms per plant procedures.

This simulator deficiency was identified prior to the 12/25/2014 scram and a simulator Discrepancy Report (DR) identifying the failure to alarm was written on 12/11/2014 (DR14-0155). This DR was closed (condition corrected) on 3/10/2015.

As described above, no additional actions were taken by the Operators, and there was no negative impact on Operator performance.

Feedwater Regulating Valve Seat Leakage

Specific Main Feedwater Regulation Valve (FRV) seat leakage is not independently modeled in the simulator, but is accounted for by level trend modeling post scram.

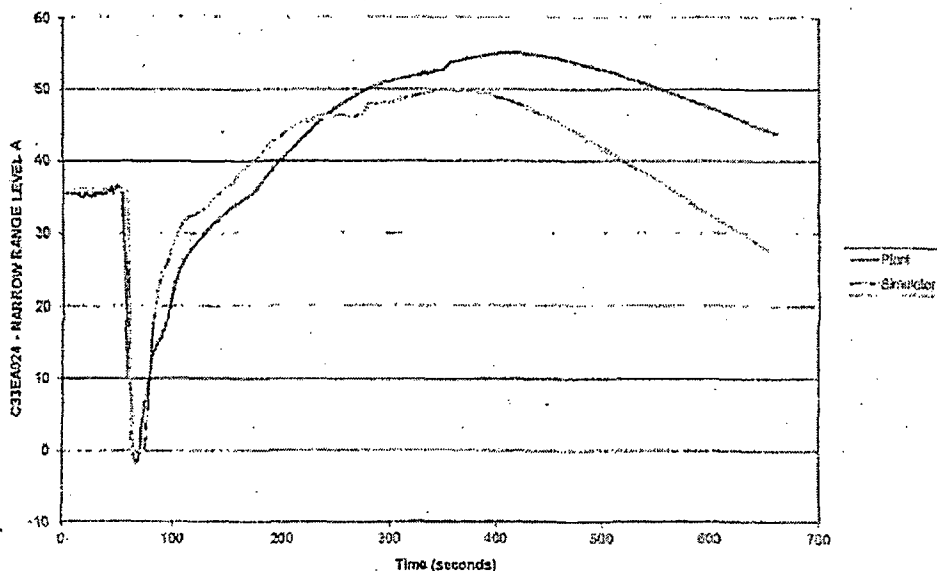
The simulator level response post scram was modeled correctly per ANSI / ANS3.5-2009 (Nuclear Power Plant Simulators for use in Operator Training and Examination), section 4.1.4 (2) Malfunctions: *Any observable change in the simulator parameters corresponds in the direction to the change expected from actual or best estimate response of the reference unit.* The simulator is tuned such that the level trend incorporates any effect caused by actual plant Main FRV seat leakage. Simulator post event testing is performed to ensure simulator response closely matches the actual plant response and corrections are made as required.

A post event simulator test was conducted on 2/3/2015 which concluded that the plant level response closely matched the simulator, and as a result, the issue had no impact on Operator performance. The Operators would have observed the same level trends post scram that were observed during simulator training. Additionally, Operators would have taken the same actions in the plant that were taken in the simulator.

A graph comparing the plant and simulator response to the 12/25/14 scram is shown below in Figure 1.

Figure 1 – Plant vs. Simulator Response – 12/25/14 scram

Scram 12-25-14 - Thu Feb 03 00:14:14 2015



Main FRV seat leakage was a plant deficiency that has been addressed in RF-18. Prior to RF-18 repairs, this degraded condition (seat leakage) was procedurally addressed by removing the valves from service post scram. The simulator performed in accordance with ANSI / ANS3.5-2009, and Operators were trained properly based on level response. Therefore, this is not a simulator fidelity issue.

Start-up Feedwater Regulation Valve

The 12/25/2014 plant scram data associated with controller output and Start-up FRV position shows a delay in valve operation not seen before, resulting in lower reactor level than what Operators have seen in both the plant and simulator (see Table 1). These differences were due to an equipment malfunction.

Table 1 is a compilation of Plant Data System (PDS) from four scrams and one simulated scram. In all four cases, the Start-up FRV was placed in auto with level demand set at 18 inches following each scram in accordance with the associated feedwater procedure (hard card – Attachment 1).

The 2010, 2011 and 2012 plant scrams reveal a consistent performance by the Start-up FRV as shown by the level when the Start-up FRV controller output signal changes to open the Start-up FRV. Additionally, as shown in Table 1 (green highlighted row), the simulator performance was consistent in the three plant scrams; controller output and FRV position responded and controlled water level above level 3 (reactor scram setpoint).

The 12/25/2014 plant scram data shows that the controller output and Start-up FRV position did not respond as it did in the 2010, 2011 and 2012 plant scrams. During this event vessel level dropped to 17" before the controller output sent an open signal to the Start-up FRV, resulting in levels lower than what Operators have seen in both the plant and simulator. This abnormal valve controller response was due to an equipment failure. The simulator performed as expected based on previous scram data prior to this abnormal occurrence, and Operators responded properly based on Feedwater Level Control failure simulator training. Most recently, Operators were trained on Feedwater Level Control malfunctions in Cycle 14-9 (September 2014), lesson plan # RSMS-OPS-107.

Details regarding the equipment issue causing this deficiency are included in the next section of this white paper.

Table 1 – Historic Plant Start-up FRV Performance vs. Simulator

	2014 12-25 Auto scram	2012 5-3 Planned scram	2011 1-15 Planned scram	2010 7-31 Planned scram	2015 4-3 Simulator
Scram Power (%)	100	30	22	17	100
Level When Start-up FRV Controller Output Changes to Open Valve (in)	17*	22.6	22.7	23.6	22.7

* Start-up FRV controller placed in manual due to no response in auto.

Start-up FRV Controller Supplemental Information

On 6/17/2013, Start-up FRV did not respond as expected when placed in service after a manual scram. Also, the valve did not respond when placed in manual. Later, when placed in manual, the valve started hunting between 20% and 40%. Main FRV "C" was placed in service to maintain reactor Water Level in the prescribed band (CR-RBS-2013-4284).

On 7/5/2013, the Turbine Building Operator reported air noise from the Start-up FRV and observed the valve move partially open then closed. The Main Control Room observed the Start-up FRV stoke to 30% open then closed and 50% open then closed (CR-RBS-2013-4664). As a result of these conditions, a caution tag was placed on the valve on 7/5/2013 until corrective maintenance could be completed.

This maintenance was completed during FO-14-01 (October 2014) when the following Start-up Feedwater Regulation Valve Control Circuit Cards were replaced:

- C33-R602-1 (S/U FRV Auto Card)
- C33-R602-2 (S/U FRV Manual Card)
- C33-R602-3 (S/U FRV Logic Card)

(b)(4) These [redacted] components were replaced with reverse engineered cards [redacted] in order (b)(4) to eliminate component obsolescence and improve reliability. The post-maintenance testing was completed with satisfactory results. Also, no issues were identified with the performance of the Start-up FRV Control Circuit during start-up from FO-14-01.

Following reactor scram (FO-14-02, December 2014), when reactor water level reached 18 inches, the Start-up FRV did not respond automatically as expected by Operations to restore reactor water level. Also, the start-up FRV did not respond to manual control. Normal Feedwater Level Control had been removed from service per OSP-0053 post-scram feed water level control hard card (Attachment 1). Main FRV "C" was placed back in service to restore reactor level. In the process, reactor water level went below level 3 (scram setpoint 9.7") before Main FRV "C" was placed fully in service. reactor water level lowered to 8.1 inches before it was restored to normal post scram level band of 10 to 51 inches (CR-RBS-2014-6602).

(b)(4) Troubleshooting was performed and the Start-up FRV manual card (C33-R602-2) showed no change in output with an up or down input signal. The manual card was replaced and the manual control function and automatic control function performed (b)(4) satisfactory. Vendor [redacted] failure analysis determined that the removed Start-up FRV manual card (C33-R602-2) had a bad OR gate that was not generating an output. In turn, this failed component prevented the manual card from entering manual control. (b)(4) According to [redacted] this failure appeared to be a random component failure and was a rare event. See Attachment 2 for the vendor failure report.

(b)(4) As noted above, the installed [redacted] automatic control card (C33-R602-1) was replaced (b)(4) with a [redacted] card during FO-14-01 (October 2014). Investigation revealed that the newly (b)(4) installed [redacted] card was setup to match the settings on the removed [redacted] automatic (b)(4)

control card. The cause for the unexpected response of the automatic function has not been determined (CR-RBS-2015-2737).

Summary

In conclusion, the simulator modeling and response is per the required industry standards with the exception of the two unexpected RPS annunciators that were identified prior to the 12/25/2014 scram. Operator performance was not impacted by simulator modeling.

Attachment 1 – Feedwater Hard Card

CONTINUOUS USE

ATTACHMENT 16
PAGE 1 OF 1

POST SCRAM FEEDWATER/CONDENSATE MANIPULATIONS BELOW 5% REACTOR
POWER

- 1 Verify Rx Water level is in the prescribed band.
- 2 Transfer to the S/U feed water level controller as follows:
 - 2.1 Place the Master feed water level controller to manual and set output to 0.
 - 2.2 Select SINGLE ELEMENT control.
 - 2.3 Roll the S/U feed water level controller tape set to 18 inches.
 - 2.4 Place the S/U feed water level controller to AUTO as desired. (The S/U feed water level controller may be placed in manual and Operated as necessary to support isolated vessel level and pressure control.)
- 3 Reduce to one Feed Pump. (Preferred order of removal A/B/C)
- 4 Depress Close on OOS Feed Reg Valve isolation MOV's.
- 5 Reduce to TWO Condensate Pumps.
- 6 Secure operating Heater Drain Pumps.
- 7 IF desired, THEN install Feedwater Pump Level 8 trip jumper per ATTACHMENT 30, Feedwater Pump Level 8 Trip Jumper Installation.
- 8 Re-Open Feed Reg Valve isolation when needed for Rx Water Level control.
 - 8.1 Verify unisolated FEED REG VALVE is in service.

Attachment 2 – Vendor Failure Analysis on C33-R602-2 (Start-up FRV Manual Card)

(b)(4)

