



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 25, 2015

David A. Lochbaum
Director, Nuclear Safety Project
Union of Concerned Scientists
PO Box 15316
Chattanooga, TN 37415

SUBJECT: FORT CALHOUN STATION, UNIT NO. 1 – REVISED FLOOD PROTECTION
STANDARDS (TAC NO. MF2591)

Dear Mr. Lochbaum:

I am responding to your letter dated July 7, 2015, to Mr. William Dean, Director, Office of Nuclear Reactor Regulation, which conveyed two concerns following your review of Amendment No. 282 to the operating license for Fort Calhoun Station, Unit No. 1 (FCS). Amendment No. 282 was issued by the U.S. Nuclear Regulatory Commission (NRC) on June 30, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15111A399).

The amendment revises the design basis method in the FCS Updated Safety Analysis Report (USAR) for controlling the raw water (RW) intake cell level during periods of elevated river levels. Specifically, the amendment changes the licensing basis described in the USAR Sections 2.7, "Hydrology," and 9.8, "Raw Water Systems," to provide the bases for the safety classification of components required for operation of the safety class 3 (SC-3) RW pumps. The licensee intends to implement a plant engineering modification to employ the trash rack blowdown portion of the circulating water system to allow river water to flow into four of those pipes and then through four newly installed safety class valves for control of cell level (RW pump suction level) using river level as the driving force. Your two concerns from your letter are excerpted below:

1. Neither the licensee nor the NRC addressed how the single failure requirement was met by the revised design or explained why this longstanding safety requirement is now not applicable.
2. The NRC staff required the owner to seismically qualify the four new valves and associated piping because a flooding event could follow a seismic event. Likewise, it follows that the NRC must also require that the sluice gates and their associated movement and control devices be seismically qualified.

Single Failure Criterion

Your letter states that,

In the revised design, all six traveling screen sluice gates must be closed to assure adequate flood protection. A single failure can prevent one sluice gate from closing.

The revised flood protection design at Fort Calhoun simply does not comport with Appendix A to 10 CFR Part 50 and its single failure provision.

The definition of "single failure" from Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," that you cited in your letter is not part of the FCS licensing basis. FCS was licensed in accordance with the 70 draft General Design Criteria (GDC) published for comment in the *Federal Register* (32 FR 10213) on July 11, 1967. The regulations in 10 CFR Part 50, Appendix A contains updated (non-draft) NRC GDC. In general, however, the licensee is required to adhere to the 70 draft GDC contained in Appendix G of the USAR. Changes to Appendix G of the USAR must comply with 10 CFR 50.59 and may require NRC approval (i.e., an NRC-approved license amendment).

The FCS USAR Appendix G states, in part:

CRITERION 21 - SINGLE FAILURE DEFINITION

Multiple failures resulting from a single event shall be treated as single failure.

This criterion is met. The design of Fort Calhoun Station, Unit No.1 is based on the concept that no single failure of active components will inhibit necessary safety action when required. The concept is interpreted that multiple failures resulting from a single event are considered as a single failure. Redundancy of components is provided in the instrumentation and controls associated with vital process systems, the containment isolation system and the engineered safeguards.

In response to your particular concern, however, the NRC staff considers that closure of the traveling screen sluice gates is part of the licensee's preparations for a flooding event and that it is reasonable that sufficient warning time is available to close the gates prior to the event. See, in particular, the licensee's response in its letter dated August 13, 2014, to staff questions SBPB RAI 1 and 2 (ADAMS Accession No. ML14226A738). Once the gates are closed, no further movement is required of them during the flooding event (i.e., they are not active components during the event). A single failure is, therefore, not required to be postulated.

For the duration of a flood, the sluice gates remain closed and perform a passive barrier function. The sluice gates are not maintained in the closed position at all times, so they may be considered a temporary barrier in the language of RG 1.102, Revision 1, "Flood Protection for Nuclear Power Plants," September 1976 (ADAMS Accession No. ML003740308), similar to the installation of portable panels on doorways below flood level. Typically, temporary barriers are

acceptable so long as they are passive, watertight, resist the static and dynamic forces associated with flooding, are included in emergency procedures, and there is sufficient warning time to implement the procedures. The sluice gates are not watertight, but an acceptable leak rate and testing frequency was established in the application. The design of the sluice gates is adequate to resist the static and dynamic forces associated with the postulated flood. The action to close the sluice gates is included in plant procedures and sufficient warning time is available to close the sluice gates, even if a sluice gate must be closed manually. Therefore, the NRC staff concluded that the use of the sluice gates for flooding protection of the RW pumps met the intent of RG 1.102, Revision 1 and was acceptable.

Seismic Qualification

The sluice gates are part of the intake structure. The intake structure is a Class I structure, as described in USAR, Section 5.11, "Structures Other Than Containment," and meets the Class I seismic criteria as defined in Appendix F, "Classification of Structures and Equipment and Seismic Criteria." Therefore, the original seismic analysis of the intake structure addresses the seismic qualification of the gates.

The purpose of the licensee's license amendment request (ADAMS Accession No. ML13231A178, Enclosure Section 2.0) was to address an NRC Notice of Violation regarding classification of the sluice gates,

...Specifically, the licensee failed to classify the six intake structure exterior sluice gates and their motor operators as Safety Class 3 as defined in the Updated Safety Analysis Report, Appendix N.

The licensee chose to revise the current licensing basis (CLB) as described in the USAR to allow implementation of plant modification engineering change (EC) 55394, "Raw Water Pump Operation and Safety Classification of Components during a Flood." The licensee proposed to change the CLB to provide the bases for the safety classification of components required for operation of the safety class 3 (SC-3) RW pumps. The modification would employ the trash rack blowdown portion of the circulating water system to allow river water to flow into four of those pipes and then through four newly installed safety class valves for control of cell level (RW pump suction level) using river level as the driving force. The *safety* classification of the gates, not the *seismic* classification, was the issue.

An extension of your concern is related to the equipment qualification of the structures, systems, and components required for flooding mitigation. In this specific amendment safety evaluation, the NRC staff only addressed the new valves, not the associated piping system. The qualification of the existing trash rack backwash piping is based on the requirements of USAR Appendix N. See the licensee's response in its letter dated August 13, 2014, to staff question SBPB RAI 5 (ADAMS Accession No. ML14226A738). Equipment qualification is being addressed at FCS. For example, the licensee committed in its "Integrated Report to Support Restart of Fort Calhoun Station and Post Restart Commitments for Sustained Improvement," dated December 2, 2013 (ADAMS Accession No. ML13336A785), that,

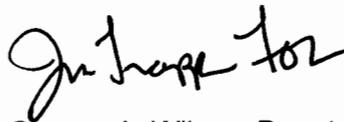
After restart, OPPD will complete a significant effort to perform a risk focused reconstitution of the design basis, the licensing basis, and the Updated Safety

Analysis Report. As part of this reconstitution, OPPD will ensure proper classification of equipment...The reconstitution project will be completed before the end of fourth quarter 2018.

Regarding equipment qualification, on April 23, 2015, a meeting was held between the NRC and licensee staffs to discuss two potential license amendment requests to revise the licensing basis for FCS. See the meeting summary at ADAMS Accession No. ML15114A378. The NRC continues to monitor the licensee's commitments to resolve issues associated with the design and licensing basis as documented in the post restart Confirmatory Action Letter issued to the licensee on December 17, 2013 (ADAMS Accession No. ML13351A395).

If you have any questions, please contact Mr. Fred Lyon at 301-415-2296 or via e-mail at Fred.Lyon@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read "George A. Wilson". The signature is written in a cursive, somewhat stylized font.

George A. Wilson, Deputy Director
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-285

cc: Listserv

Analysis Report. As part of this reconstitution, OPPD will ensure proper classification of equipment...The reconstitution project will be completed before the end of fourth quarter 2018.

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If you have any questions, please contact Mr. Fred Lyon at 301-415-2296 or via e-mail at Fred.Lyon@nrc.gov.

Sincerely,

/RA James Trapp for/
 George A. Wilson, Deputy Director
 Division of Operating Reactor Licensing
 Office of Nuclear Reactor Regulation

Docket No. 50-285

cc: Listserv

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ADAMS Accession No. ML15223A984 *previously concurred

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