PMSTPCOL PEmails

From: Wunder, George
Sent: Thursday, October 17, 2013 9:21 AM
To: STPCOL
Subject: FW: Response to RAI letter 436
Attachments: U7-C-NINA-NRC-130055.pdf

From: Richard Scheide [mailto:RHScheide@ninallc.net]
Sent: Wednesday, October 16, 2013 2:42 PM
To: Misenhimer, David; Brown, Frederick; Wunder, George; Foster, Rocky; Jenkins, Ronaldo; Tai, Tom
Subject: Response to RAI letter 436

Attached please find the NINA response to RAI letter 436. Hard copy to follow.

Hearing Identifier: SouthTexas34Public_EX
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Subject: FW: Response to RAI letter 436
Sent Date: 10/17/2013 9:21:09 AM
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From: Wunder, George

Created By: George.Wunder@nrc.gov

Recipients:
"STPCOL" <STP.COL@nrc.gov>
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979-316-3000

October 16, 2013
U7-C-NINA-NRC-130055

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Revised Response to Request for Additional Information

Attached is the Nuclear Innovation North America, LLC (NINA) response to the NRC staff question in Request for Additional Information (RAI) letter number 436 related to SRP Section 1.05. The attachment to this letter contains the response to the following RAI question:

01.05-22

Where a COLA change is indicated, it will be made in the next routine revision to the COLA.

There are no commitments in this submittal.

If you have any questions, please contact me at (979) 316-3011 or Bill Mookhoek at (979) 316-3014.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 10/16/13

Scott Head
Manager, Regulatory Affairs
NINA STP Units 3&4

Attachment:

RAI 01.05-22

(paper copy)

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QUESTION

01.05-22

In regards to the response to RAI 01.05-11 as documented in U7-C-NINA-NRC-130039, the staff reviewed the applicant's response and determined that the response is insufficient to completely address the staff's concerns described in RAI 01.05-11. Specifically, the inadequacy on the response to Item 3 is discussed below.

Item 3 of RAI 01.05-11 asked the applicant to list the power sources under ELAP for all the valves and pumps that will be required for mitigation strategies for Phase 1 and for Phase 3 respectively including core cooling, containment overpressure protection, and spent fuel pool cooling. Also, identify all the manual operations for the pumps and valves.

In the response, the applicant indicated that the response to RAI 01.05-5 (letter U7-C-NlNANRC-130031, dated May 2, 2013), in conjunction with the calculation entitled, "Extended Station Blackout Scenario," dated August 2012, performed by DP Engineering, Ltd., provide a detailed listing of all valves, pumps, and manual operator actions required for the mitigation strategies and their power sources. Although substantially complete based on all available information, the level of detail provided in these documents is constrained because detailed design for STP 3 & 4 is not yet complete and operating procedures have not yet been developed. To ensure these plans are complete and are executed effectively, the FLEX Integrated Plan includes the requirement that STP 3&4 will implement the activities in the FLEX Integrated Plan using procedures developed based on industry guidance from the Boiling Water Reactor Owners Group (BWROG), EPRI, and NEI as part of the Procedure Development Plan described in FSAR Section 13.5. The procedures, training, and any walkthrough validation will be in place and completed 180 days prior to the initial fuel load of Unit 3.

The staff audited the above calculations and found that the applicant has not provided a listing of all valves, pumps, and manual operator actions required for the mitigation strategies and their power sources with the exception of a few valves being identified to be supported by Class IE 125 VDC. The applicant has not demonstrated that these valves can satisfy the functional requirement of mitigation strategies for Phase 1 through Phase 3 including core cooling, containment overpressure protection, and spent fuel pool cooling. In addition, the applicant pointed to the FLEX Integrated Plan using procedures developed based on industry guidance from the BWROG, EPRI, and NEI as part of the Procedure Development Plan described in FSAR Section 13.5. The staff found that industry guidance from the BWROG, EPRI, and NEI does not include ABWR, specifically the operation of ACIWA. FSAR 13.5 does not include ELAP. These pointers do not provide additional information, and is not sufficient to address the question. The information being asked in Item 3 of RAI 01.05-11 is design information and does not need to wait for the procedures. Therefore, the applicant's response to Item 3 of RAI 01.05-11 is not acceptable.

The staff requests the applicant to list the power sources under ELAP for all the valves and pumps that will be required for mitigation strategies for Phase 1 and for Phase 3 respectively

including core cooling, containment overpressure protection, and spent fuel pool cooling. Also, identify all the manual operations for the pumps and valves.

RESPONSE

As demonstrated by the Extended Station Blackout Scenario analysis performed by DP Engineering, power will remain available to the DC MOVs required to operate RCIC throughout the ELAP event. These valves will be operated using a handswitch mounted at or near the valve locations.

There is no need for industry guidance regarding the operation of ACIWA since operation of the system is discussed in the ABWR DCD Subsection 5.4.1.1.10. However, NINA has submitted ABWR FLEX implementation guidance entitled "Guidance for ABWR Design" to NEI for inclusion as Appendix H in NEI 12-06 "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide."

FSAR Subsection 13.5.3.4.7 (Abnormal Operating Procedures) currently includes a requirement to develop abnormal operating procedures to address loss of electrical power. However, Subsection 13.5.3.4.7(3) will be revised in the next routine revision to the COLA as shown below in shaded text to clarify that ELAP will be included in those procedures.

13.5.3.4.7 Abnormal Operating Procedures

As discussed in Section A 10 of ANSI/ANS-3.2, procedures will be provided to guide operation for significant events. Examples of such events are listed below.

(1) Loss of Coolant (inside and outside primary containment, response to large and small breaks, including leak-rate determination)

(2) Loss of Instrument Air

(3) Loss of Electrical Power (~~or~~ including degraded power sources or both and Extended Loss of AC power)

Listed below are the valves and pumps required to mitigate an ELAP in Phases 1 and 3 as described in the STP 3 & 4 ABWR FLEX Integrated Plan. Also listed are their associated power sources and the required manual operations of the valves.

Phase 1:

Phase 1 makes use of the steam driven RCIC and ACIWA systems to provide core cooling during the initial 36 hours. A reactor scram occurs upon initiation of the ELAP. The Main Steam Isolation Valves (MSIVs) close and the Reactor Internal Pumps (RIPs) coast down. Feedwater pumps will also coast down and the Reactor Pressure Vessel (RPV) water level begins to decrease. When the water level reaches Level 2, the RCIC system starts injecting into the RPV taking suction from the Condensate Storage Tank (CST). The steam generated in the core is discharged to the suppression pool through the

Safety Relief Valves (SRVs) and by RCIC turbine exhaust. RCIC will automatically control RPV level until DC load stripping disables the system control logic at which time level will be controlled manually by an operator.

Valves and pumps required for Phase 1:

RCIC

- Pump (C002) – Steam driven (FSAR Figure 5.4-8, Sh. 1)
- F004: (RPV Injection valve from RCIC pump)–Division 1 DC MOV (FSAR Figure 5.4-8, Sh. 1)
- F037: (Steam admission valve) – Division 1 DC MOV (FSAR Figure 5.4-9, Sh. 1)
- F001: (Supply from CST) – Division 1 DC MOV (FSAR Figure 5.4-8, Sh. 1)
- F006: (Supply from Suppression Pool) – Division 1 DC MOV (FSAR Figure 5.4-8, Sh. 1)
- F011: (RCIC bypass isolation) - Division 1 DC MOV (FSAR Figure 5.4-8, Sh. 1)

ACIWA

- F101 (Manual Isolation between RHR and FPS) (FSAR Figure 5.4-10, Sh. 7)
- F102 (Manual Isolation between RHR and FPS) (FSAR Figure 5.4-10, Sh. 7)
- F005C (RHR RPV Isolation) AC MOV (FSAR Figure 5.4-10, Sh. 7)
- SRV solenoid valves Division 1 DC
- Fire Pump - Diesel driven

COPS

- COPS is a passive system and requires no operator actions or valve manipulations. It vents containment when its rupture disc actuates.

Manual operations of valves and pumps during Phase 1

- Operator will be dispatched to operate RCIC manually by throttling the RCIC injection valve (F004) after DC load stripping. [handswitch at or near valve]
- Shift RCIC suction from CST to suppression pool upon receipt of suppression pool high level alarm by manually opening F006 and closing F001. [handswitch at or near valve]
- Shift RCIC suction back to CST when Suppression pool temperature approaches 250 degrees F by manually opening F001 and closing F006. [handswitch at or near valve]
- Align ACIWA to RPV by manually opening F005C, F101, and F102. [handwheel]

- When CST level approaches the end of usable volume, an SRV will be opened from the Remote shutdown panel to initiate RPV depressurization to ACIWA injection pressure
- When ACIWA begins to inject to the RPV, RCIC will be secured by manually closing F001, F004, F006, F011, and F037. [handswitch at or near valves]

Phase 3

After 36 hours, Phase 3 begins with core cooling being provided by ACIWA. As Phase 3 proceeds, operator action would be necessary to shift ACIWA suction to the volume of water in the approximately 16 million gallon UHS basin. Operators would also need to transfer diesel fuel from one of the three Emergency Diesel Generator fuel oil storage tanks to the ACIWA fuel storage tank using a staged portable pump and small portable diesel generator. Two FLEX 480V 1500 KW diesel generators from offsite would be connected and started to provide AC power for battery charger operation, limited ventilation system operation, and other limited uses. Command and control is expected to be shifted back to the Main Control Room early in Phase 3.

SFP

- F14C, F15C (Loop C double Isolation between RHR Loop C and fuel pool cooling) – AC MOVs (FSAR Figure 5.4-10, Sh. 7)

ACIWA

- Valves (yet unnamed) to transfer ACIWA suction to UHS
- Portable pump and small portable diesel generator to transfer fuel to ACIWA fuel storage tank.

Manual operations of pumps and valves during Phase 3

- Make up to SFP as necessary by manually opening F14C and F15C. [handwheel]
- Add fuel to ACIWA fuel storage tank as necessary
- Transfer ACIWA suction to UHS
- Install and operate FLEX air compressors
- Install and operate temporary ventilation systems
- Install and operate FLEX 480 VAC diesel generators