

PMSTPCOL PEmails

From: Wunder, George
Sent: Monday, October 07, 2013 8:52 AM
To: STPCOL
Subject: FW: Revised response to RAI 01.05-21 (U7-C-NINA-NRC-130054
Attachments: U7-C-NINA-NRC-130054 Final signed.pdf

From: Richard Scheide [<mailto:RHScheide@ninallc.net>]
Sent: Monday, September 23, 2013 11:51 AM
To: Misenhimer, David; Brown, Frederick; Wunder, George; Eudy, Michael; Foster, Rocky; Jenkins, Ronaldo; Tai, Tom
Subject: Revised response to RAI 01.05-21 (U7-C-NINA-NRC-130054

Please find attached the revised response to RAI 01.05-21. Hard copy will be forwarded, as appropriate.

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September 23, 2013
U7-C-NINA-NRC-130054

U. S. Nuclear Regulatory Commission
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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) revised response to the NRC staff question in Request for Additional Information (RAI) letter number 435 related to SRP Section 1.05. Attachment 1 to this letter contains the revised response to the following RAI question and replaces the previous response in its entirety:

01.05-21

Attachment 2 contains a proposed revision to FSAR Appendix 1E, Section 2.4 “Mitigating Strategies for Beyond Design Basis Events (4.2)” which addresses the revised response in Attachment 1 and changes necessary to implement the STP 3 & 4 ABWR FLEX Integrated Plan.

Attachment 2 also contains a proposed change to COLA Part 9, Section 3.0 which adds an ITAAC regarding implementation of system design requirements to support FLEX as discussed in FSAR Appendix 1E.2.4.

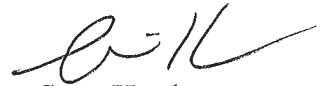
The COLA changes in this submittal will be incorporated in the next routine revision to the COLA following NRC acceptance of this response.

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 9/23/13



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

Attachments:

1. RAI 01.05-21, Revision 1
2. COLA Changes

(paper copy)

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Question

01.05-21

In regards to the response to RAI 01.05-5, the staff reviewed the applicant's response and determined that the response is insufficient to completely address the staff's concerns. The NRC staff needs sufficient information in order to reach a safety conclusion within the COLA review. The applicant should address the specific provisions in Interim Staff Guidance (ISG) JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," (ML12229A174), dated August 29, 2012 that endorses the Nuclear Energy Institute (NEI) 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide". The ISG provides an acceptable method for satisfying Order EA-12-049. As stated in the ISG, other methods may be used to satisfy Order EA-12-049, but these methods will be reviewed by the NRC staff on a case-by-case basis to determine their acceptability. If the applicant proposes to use methods that differ from those in the ISG and endorsed guidance, the applicant should explain why these alternative methods are acceptable.

In response to RAI 422, Question 01.05-5, the applicant submitted "STP 3&4 ABWR FLEX Integrated Plan" to address issues related to Fukushima Near-Term Task Force (NTTF) Recommendation 4.2, "Mitigation". On page 3 of 60 of the FLEX Plan, the first paragraph states: "At STP 3&4, the 20 MWe CTGs are housed in structures which protect them from design floods and site severe weather events.... Although the CTGs are not specifically protected from wind generated missiles, at STP 3&4, the CTGs are located in the Turbine Buildings separated by approximately 900 feet and failure of both due to wind generated missiles is considered to be extremely unlikely. ..."

In the cited paragraph above, the applicant indicates that the Turbine Buildings (TBs) will house Combustion Turbine Generators (CTGs) and protect them from design floods and site severe weather events. It also states that the CTGs are located in the TBs separated by approximately 900 feet and failure of both due to wind generated missiles is considered to be extremely unlikely.

In Chapter 3 of STP 3&4 FSAR (Revision 9), Table 3H.9-1 indicates that only the lateral load resisting system of the TBs will be evaluated against stability and II/I interactions under the effects of extreme environmental conditions including earthquake, tornado and tornado missiles, hurricane and hurricane missiles, and flood. The Table also indicates that the TBs (except for the lateral load resisting system) are not designed against tornado and tornado missiles, hurricane and hurricane missiles, or flood (page 3H-242). Although the likelihood of the simultaneous failure of both CTGs located in the TBs due to tornado- or hurricane generated missiles is low, the CTGs in the TBs are potentially vulnerable to the wind effects of tornado and hurricane.

RAI 01.05-21, Revision 1

The staff requests that the applicant clarify how the statements cited above from the FLEX plan can be reconciled with the information presented in Table 3H.9-1 of the FSAR. Specifically, the applicant is requested to clearly describe in the FLEX plan and updated FSAR how the CTGs located in the TBs are protected against the effects of tornado, hurricane, and flood.

Response

The discussion below addresses comments made by NRC staff during review of the original response to RAI 01.05-5 and replaces the previous response in its entirety.

The discussion below is provided to clarify the statements made in the plan relative to CTG protection and the information contained in FSAR Table 3H.9-1.

FSAR 1C.2.2.2 (Specific SBO Design Basis) states that the CTG will be housed in an International Building Code (IBC) structure which is protected from adverse site weather related conditions.

DCD 1C.2.5.10 (CTG- Physical Protection Considerations) states that “[t]he CTG is housed in a building (separate from the building which contains the DGs) above the design flood levels. The building is designed to protect the CTG from site related weather conditions.”

FSAR 3.7.2.8 (Interaction of Non-Seismic Category I Structures, Systems and Components with Seismic Category I Structures, Systems and Components) states that the overall design of non-Category I structures is based on IBC-2006. However, the lateral load resisting system is designed to remain elastic under the extreme environmental loads shown in Table 3H.9-1 using the same loads, load combinations and design codes (i.e. ACI 349 and AISC N690) as those for the adjacent Category I structure. Table 3H.9-1 does not address equipment in the turbine building.

As stated above, Table 3H.9-1 documents that the turbine building will remain elastic under design basis extreme weather conditions. This does not mean that all of the equipment in the turbine building is necessarily protected from extreme weather conditions; nonetheless, the CTG and support equipment in the turbine building will be designed to withstand site related weather events and will be installed above design flood levels, as required by the DCD. In addition, FSAR Appendix 1E, Subsection 2.4 will be revised in the next revision of the COLA to require that the CTGs be protected from hurricane and tornado missiles. This change is identified by a revision bar in the proposed change included as Attachment 2 of this submittal, which also incorporates changes required to support the implementation of the STP 3 & 4 ABWR FLEX Integrated Plan.

Also, an ITAAC will be added to COLA Part 9, Section 3.0 in the next routine revision of the COLA as shown in shaded text in Attachment 2 of this submittal to verify that the requirements of Appendix 1E.2.4 are adequately implemented.

RAI 01.05-21, Revision 1

In summary, the statements in Table 3H.9-1 are correct, do not conflict with the statements regarding the CTG protection requirements in the FLEX plan and in other places in the COLA, and therefore do not require reconciliation. There are no COL items related to the CTG protection requirements, and the DCD does not prescribe specific methods for achieving the CTG protection requirements.

Furthermore, the present state of the detailed design of STP 3&4 has not progressed to the point that the details of the CTG protection have been finalized. These details are not required to be in the FSAR nor should they be included in the STP 3 & 4 ABWR FLEX Integrated Plan.

COLA Changes

FSAR Appendix 1E, Section 2.4 “Mitigating Strategies for Beyond Design Basis Events (4.2)” will be replaced in its entirety in the next routine revision of the COLA as shown below in shaded text. This revision supersedes the proposed revision contained in Attachment 2 of letter U7-C-NINA-NRC-130031 (ML13128A140)

1E.2.4 Mitigating Strategies for Beyond Design Basis Events (4.2)

NRC Recommendation

NRC issued Order EA-12-049 (Reference 1E-5) to power reactor licensees and holders of construction permits requiring a three-phase approach for mitigating beyond-design-basis external events. The initial phase requires the use of installed equipment and resources to maintain or restore core cooling, containment and spent fuel pool (SFP) cooling capabilities. The transition phase requires providing sufficient, portable, onsite equipment and consumables to maintain or restore these functions until they can be accomplished with resources brought from offsite. The final phase requires obtaining sufficient offsite resources to sustain those functions indefinitely.

Response

STP 3 & 4 incorporates three staged AC independent portable pumping systems:

- Two pumps (a fire truck and a trailer mounted portable pump) shared between STP 3 & 4 provide core, SFP, and containment cooling water to the RHR system via the ACIWA system. Operation of the ACIWA system is discussed in DCD Subsection 5.4.7.1.1.10.
 - The fire truck is stored in the Turbine Building Truck Bay and is protected from site hazards with the exception of floods.
 - The trailer mounted portable diesel-driven pump is stored in a Seismic Category I structure as required for protection from severe weather events (FSAR Subsection 19.4.6). In addition, one of the two diesel driven pumps to be procured in accordance with FLEX guidance will be stored in a Seismic Category I structure. These pumps will be included in the DRAP.
- One trailer mounted pump shared between STP 1, 2, 3, & 4 provides water in the event of the loss of large areas of the plant (Part 11, Subsection 5.1.2).
 - This trailer mounted pump is protected primarily by distance.
- In addition to the above pumps, two additional portable high capacity pumps will be procured as described in the paragraph below. This will result in one high capacity portable trailer mounted diesel driven pump stored in a Seismic Category I structure in each unit, two fire trucks stored in a turbine building, and one trailer mounted diesel driven pump shared between the four units.

Additional equipment to be procured to provide defense in depth mitigation capability includes:

- Two diesel driven high capacity pumps (one/unit) one of which will be required to be kept in a Seismic Category I structure
- Six portable diesel generators (three/unit)

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- Four portable DC power supplies (two/unit)
- Eight handheld satellite phones (four/unit)
- Various hoses, fittings, cables, and jumpers necessary to connect the above equipment

The STP 3 & 4 approach for mitigating a Beyond Design Basis External Event (BDBEE) is described in Reference 1E-14, STP 3&4 ABWR FLEX Integrated Plan. This plan is patterned after the industry FLEX program (Reference 1E-3). This industry program was endorsed by the NRC (with comments) in Reference 1E-13.

The STP 3 & 4 FLEX Integrated Plan provides guidance and strategies to restore core cooling, containment cooling, and spent fuel cooling following a BDBEE involving one or both STP 3 & 4 units. The strategies are capable of mitigating a simultaneous loss of all alternating current (ac) power (including both CTGs) and loss of normal access to the ultimate heat sink, and are capable of being implemented in all operating modes. The equipment required to mitigate the BDBEE will be adequately protected from external events.

The guidance utilizes a two-phase approach.

- Phase 1 uses installed equipment and resources to maintain or restore core, containment, and spent fuel pool (SFP) cooling capabilities. Phase 1 will be 36 hours in length. Since the FLEX equipment can be delivered from the offsite Regional Response Center to the site within 32 hours, there is no need for a Phase 2 using onsite portable equipment and there is a direct transition from Phase 1 to Phase 3 at 36 hours.
- The final Phase 3 will obtain sufficient offsite resources to sustain the core cooling, containment cooling, and spent fuel cooling functions indefinitely.

As described in the introduction to the STP 3&4 FLEX Integrated Plan (Reference 1E-14), the coping strategy does not credit the Combustion Turbine Generators (CTGs) that are part of the STP 3&4 design. However, based on the robust construction of the CTGs and design requirements that they be installed above the design flood level and be protected from site related weather conditions (DCD Subsection 1C.2.5.10), the CTGs would likely survive a BDBEE and would clearly be the initial approach in responding to such an event. The coping strategy described in the FLEX Integrated Plan credits the installed Reactor Core Isolation Cooling (RCIC), AC Independent Water Addition (ACIWA), and the Containment Overpressure Protection (COPS) systems to provide core, containment, and spent fuel cooling during Phase 1 and Phase 3 consistent with the NRC Order.

To support the implementation of the FLEX Plan, the following system design requirements will be incorporated into the STP Units 3&4 final design:

- The CTGs will be protected from design basis hurricane and tornado missiles.
- Battery jumper connections will be installed and normally disconnected cabling will be installed as necessary to allow the four divisions of the Class 1E 125 VDC battery

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systems to be connected to the Division 1 battery bus to provide extended 125 VDC power.

- The Condensate Storage Tank (CST) for each unit will be constructed to withstand the site-specific Safe Shutdown Earthquake (SSE) of 0.13g, missile, flood, high wind and other site specific severe weather hazards.
- The ACIWA System (including the fuel supply tank) will be protected against site flood and severe weather events. The ACIWA diesel fuel storage tank will have sufficient storage capacity to support 36 hours of operation for both units.
- Both Fire Water Storage Tanks will be constructed to withstand the site-specific SSE of 0.13g, missile, flood, high wind, and other site specific severe weather events.
- A permanent piping connection to allow the ACIWA System to take suction from the water volume in the UHS Basins will be installed with the appropriate separation of safety related and non-safety related systems.
- One plant stack radiation monitor will be powered by Division 1E power
- Internal plant radio communications will be powered by the non-1E 250 VDC battery located in the Control Building for at least 36 hours
- Permanent electrical connections will be installed to allow the Phase 3 FLEX 480V 1500 kW DGs to be connected outside the Reactor Building and provide power to ESF Load Centers.

The detailed procedures and training to support the FLEX Program will be developed during implementation of Operational Programs as discussed in FSAR Section 13.4S in cooperation with STP Units 1 & 2 as a 4 unit site.

Also, FSAR Appendix 1E, Section 2.4 “References” will be revised in the next routine revision of the COLA as shown below in shaded text.

1E.2.4 References

1E-14 STP 3&4 ABWR FLEX Integrated Plan, May 2, 2013.

Additionally, COLA Part 9, “Inspections, Tests and Acceptance Criteria” will be revised in the next routine revision of the COLA as shown below in shaded text.

Table 3.0-30 Mitigating Strategies for Beyond Design Basis External Events

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
1. The basic configuration of the system design requirements to support FLEX implementation are as stated in FSAR, Appendix 1E.2.4	1. Inspections of the as-built FLEX support provisions will be conducted	1. A report exists documenting that the system design requirements are implemented as discussed in FSAR, Appendix 1E.2.4