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AREVA NP Response to Review Status of the ANP-10272, "Software Program Manual For TELEPERM XS Safety Systems Topical Report" (TAC No. MD3971)

Ref. 1: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Request for Review and Approval of ANP-10272, 'Software Program Manual for TELEPERM XS™ Safety Systems Topical Report'," NRC:06:061, December 21, 2006.

Ref. 2: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Additional Information Regarding ANP-10272, 'Software Program Manual for TELEPERM XS™ Safety Systems Topical Report' (TAC No. MD3971)," NRC:09:014, February 18, 2009.

Ref. 3: Letter, Sandra M. Sloan (AREVA NP Inc.) to Document Control Desk (NRC), "U.S. EPR Instrumentation and Controls Topical Reports," NRC: 09:004, January 23, 2009.

Ref. 4 Letter, Getachew Tesfaye (NRC) to Ronnie L. Gardner (AREVA NP Inc.), "Review Status of the ANP-10272P, 'Software Program Manual For TELEPERM XS Safety Systems Topical Report' (TAC No. MD3971)," March 9, 2009.

AREVA NP Inc. (AREVA NP) requested the NRC's review and approval of topical report ANP-10272 Revision 0, "Software Program Manual for TELEPERM XS™ Safety Systems Topical Report," in Reference 1.

AREVA NP Inc. (AREVA NP) provided a draft Revision 1 of the Software Program Manual Topical Report in Reference 2, as previously committed in Reference 3. The draft revision incorporated changes associated with the Requests for Additional Information (RAI) responses provided to the NRC to date. The purpose of providing the draft revision was to allow the reviewers to see the collective impact of the changes made as a consequence of the RAI responses. In addition, explicit references to the TELEPERM XS Simulation Validation Test Tool (SIVAT) were removed and replaced with more general language allowing the future use of an NRC approved simulation test tool.

Since that submittal, the NRC provided an additional set of comments on the Software Program Manual by Reference 4. AREVA NP has reviewed the comments provided in the NRC letter dated March 9, 2009 (Reference 4), and provided response as an enclosure to this letter. AREVA NP has also made appropriate changes to the draft Revision 1 of the Software Program Manual Topical Report. In addition, AREVA NP included new guidance patterned after 10 CFR 50.59 to address future TELEPERM XS platform changes for use in U.S. Projects. An

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updated version of Draft Revision 1 of the Software Program Manual Topical Report is included as an enclosure to this letter.

AREVA NP continues to believe that a meeting or an on-site audit at the earliest convenience of the NRC to obtain final clarification and to agree upon the proposed revisions to the Software Program Manual Topical Report would be most helpful. Subsequent to the meeting, AREVA NP will submit Revision 1 of the Software Program Manual Topical Report.

If you have any questions related to this submittal, please contact Ms. Sandra M. Sloan, Regulatory Affairs Manager for New Plants. She may be reached by telephone at 434-832-2369 or by e-mail at sandra.sloan@areva.com.

Sincerely,



Ronnie L. Gardner, Manager
Corporate Regulatory Affairs
AREVA NP Inc.

Enclosures

cc: G. Tesfaye
Docket No. 52-020

AREVA NP RESPONSE to SUMMARY OF THE NRC STAFF CONCLUSIONS
REGARDING ANP-10272, "SOFTWARE PROGRAM MANUAL (SPM) FOR THE
TELEPERM XS SAFETY SYSTEMS" TOPICAL REPORT, REVISION 0

NRC Concern 1 – Revisions: *The staff has received numerous requests for additional information (RAI) responses, many of which modify the SPM, and some of which may conflict with earlier responses. For this reason, AREVA is requested to designate the exact changes which will be made in response to each RAI question. Also, due to the extent of changes, it is necessary for the staff to have a revision of the TR on the docket to facilitate further review. The revision should incorporate past RAI responses as well as modifications associated with the topics discussed in this letter.*

AREVA NP Response: AREVA NP submitted a draft Revision 1 of the Software Program Manual Topical Report to NRC by letter dated February 18, 2009. The draft revision incorporated changes associated with the Requests for Additional Information (RAI) responses provided to the NRC to date. The purpose of providing the draft revision was to allow the reviewers to see the collective impact of the changes made as a consequence of the RAI responses. In addition, explicit references to the TELEPERM XS Simulation Validation Test Tool (SIVAT) were removed and replaced with more general language allowing the future use of an NRC approved simulation test tool.

AREVA NP has reviewed the comments provided in the NRC letter dated March 9, 2009, and made appropriate changes to the draft Revision 1 of the Software Program Manual Topical Report. In addition, AREVA NP included new guidance patterned after 10 CFR 50.59 to address future TELEPERM XS platform changes for use in U.S. Projects. An updated version of Draft Revision 1 of the Software Program Manual Topical Report is included as an Enclosure to this letter.

AREVA NP believes that a meeting or an on-site audit at the earliest convenience of the NRC to obtain final clarification and to agree upon the proposed revisions to the Software Program Manual Topical Report would be most helpful. Subsequent to the meeting, AREVA NP will submit Revision 1 of the Software Program Manual Topical Report.

NRC Concern 2 – Scope: *Which portions of the SPM are mandatory and what portions are optional? The response to RAI 66 was not clear. The staff needs to clearly understand what is being sought for approval.*

AREVA NP Response: Section 1.0 was modified to eliminate reference to software plan material contained in AREVA NP Operating Instructions. Instead, the relevant material was incorporated into the various sections of the TELEPERM XS Software Program Manual. Table 1-1 was revised to provide the cross reference between BTP 7-14 plan topics and the corresponding Software Program Manual sections.

Section 3.1 was added to clarify the scope of the TELEPERM XS Software Program Manual. Section 3.1.6 was added to specifically define the additional items that can only be addressed on a project-specific basis. See the responses to NRC concerns 5 and 8 below.

NRC Concern 3 - Specification and Coding Environment (SPACE): *SPACE is not safety-related. In the TXS Topical Report SER, SPACE was approved as part of an overall life cycle process. SPACE is required to have verification and validation (V&V) of its output including the SPACE functional block diagrams adequately and appropriately represent the Software Design Description (SDD). Acceptable V&V of application software was credited but not the capability of SPACE. The SPM needs to be revised to appropriately address SPACE.*

AREVA NP Response: Sections 4.0 and 4.2 were modified to address the use of the SPACE tool as a fully qualified tool approved by NRC, which found "that the SPACE tool has the capability and safeguards to ensure that the implementation of the application programs can be successfully accomplished on a plant-specific basis." In addition, the use of various verification and validation activities to check the Application Software created in the project-specific design process.

It must be noted that any previous description of the SPACE tool as safety-related has only been meant to convey that the automatic code generators are design and qualified with the same processes used for the TELEPERM XS System Software that runs on the safety processors. It has never been meant to convey or suggest that verification or validation of the Application Software does not have to be performed.

Sections 11 and 13 have been greatly expanded to convey the full depth and breadth of the verification and validation activities performed for Application Software developed for TELEPERM XS projects. The simple reference to IEEE Std 1012-1998 in revision 0 of the Software Program Manual has proven to be inadequate in describing these activities.

NRC Concern 4 - Scope of AREVA NP Software Development Procedures: *Applicant's response to RAI 7 states that the "AREVA GmbH procedures do not apply to the development of TXS application software for U.S. projects." Clarify in the SPM, to what systems, processes and tools, the AREVA NP GmbH software development procedures and software development procedures for the SPM apply.*

AREVA NP Response: Section 3.4 described the use of Operating Instructions to implement the Software Program Manual for work done in the U.S. for the implementation of TELEPERM XS projects. Section 4.0 was modified to note that the procedures described in Section 5 of the TELEPERM XS Topical Report apply to the TELEPERM XS platform development work performed in Germany.

NRC Concern 5 - Conformance to Guidance: *The staff needs to know if "conforms to the guidance" is the same as 100 percent compliance. Staff needs to have a clear understanding of what guidance documents and standards will be followed, and to what degree they will be followed. The staff cannot approve the SPM without a clear understanding of what is being approved. For example, the response to RAI 72 did not discretely answer the conformance to guidance question.*

AREVA NP Response: Section 3.6 was added to incorporate the requested information.

NRC Concern 6 - Verification and Validation (V&V): *AREVA takes exception to IEEE Standard 1012 in that the applicant says component verification and validation testing is not mandatory. Justify this exception. Also, it should be clear from the SPM that the V&V Manager determines the scope of V&V activities as opposed to Technical Manager and Quality Assurance, see RAI 71, and the final system testing is the responsibility of the V&V group.*

AREVA NP Response: The overall TELEPERM XS approach to component testing is described in Section 13.1. The responsibility for validation testing is the responsibility of the Verification and Validation Group, as described in Sections 11.2, 11.8, 11.9.3, 11.9.4, 11.9.5, 11.10, 13.2, and 13.3.

NRC Concern 7 - Software Configuration Management: *AREVA takes exception to IEEE Standard 828 in that the applicant says a separate software configuration management organization, including a configuration control board (CCB), is not required. Justify this exception. For example, AREVA should provide an analysis of each task required of a software configuration management organization as defined by IEEE 828, and then assign these tasks appropriately. Included would be a procedure on how project meetings and Design Review Boards will perform the same tasks as a CCB.*

AREVA NP Response: Section 12.2.3 has been revised to specify the use of configuration control boards for Applications Software development.

NRC Concern 8 – SIVAT: *If AREVA NP plans to credit SIVAT in the software V&V stage of the software lifecycle, AREVA NP should provide documentation demonstrating that SIVAT was developed to a quality software development process.*

At the January 15, 2009 meeting, AREVA NP proposed to revise the SPM to describe a software V&V process without crediting SIVAT. The proposal would allow the option of using SIVAT once the quality of the tool has been adequately demonstrated and approved by the NRC staff. If AREVA NP plans to move forward with the proposal, the option for using a software verification and validation tool should at a minimum provide a description (i.e., scope and purpose) of how the optional tool would be used in software V&V.

AREVA NP Response: The following sections were revised to describe the option of using a NRC approved simulation test tool: 4.2, 4.3, 11.8, 11.9.3, 11.9.4, 11.9.5, 13.2, and 13.3. Additional details on the use of the TELEPERM XS simulation validation tool (SIVAT) for validation testing will be described in a separate topical report. That same report will also describe the limitations of simulation testing with SIVAT and the other verification and validation activities that address the limitations.

NRC Concern 9 - Software Safety Analysis: *As an exception to the SRP, BTP HICB-14, AREVA has identified that it does not intend to use a software safety organization nor does it perform a specific analysis of the application software to detect hazards. In the response to RAI 20, it is stated that "The AREVA approach to this topic was predicated on the use of the NRC-approved TXS object oriented automated code generation tools for the development of the application software." The NRC has identified the output quality of the tools must be adequately demonstrated and approved by the NRC staff. Also, for the ONS 1, 2 & 3 RPS/ESFAS Controls Upgrade, AREVA personnel agreed to produce a software safety analysis. Therefore, the SPM should be revised to reflect the assignments of each task of a software safety organization to some other safety organization and that a software safety analysis will be provided.*

AREVA NP Response: Section 10 was expanded to provide the requested information.

NRC Concern 10 - Other Software Tools: *Identify whether other software tools (examples: FunBase, cmp_code and rediff) are credited in software development process. If credited, applicant should provide acceptable demonstration of software quality. If not credited, discussion of the tools should be removed or it should be clearly stated that such tools are not credited for software development.*

AREVA NP Response: Section 4.2 was added to incorporate the requested information.

NRC Concern 11 - Other Issues: *V&V organization should be responsible for the preparation of test plans and not the software development organization. It should be made clear that V&V personnel should perform all V&V functions, they can be assisted by other personnel, but the duty, responsibility and implementation belong to the V&V organization.*

The Quality Assurance Manager manages the Software Quality Assurance Plan not the technical manager. Additionally, see RAI 76, concerning the role of Quality Assurance Manager, and RAI 41, concerning a need for a Software Integration Plan.

AREVA NP should clarify of how and who can close open items in the open item database.

There should be assurances that no unused code is present versus no used code is run on any processor.

AREVA NP Response: The responsibility for validation testing is the responsibility of the Verification and Validation Group, as described in Sections 11.2, 11.8, 11.9.3, 11.9.4, 11.9.5, 11.10, 13.2, and 13.3.

Section 3.3.1 and 5.3 were revised to clarify the roles and responsibilities for the Software Quality Assurance Plan.

Section 6 was added to address the Software Integration Plan.

Section 3.5.2 was revised to address the closure of open items.

Section 4.2 was revised to address the question of unused code.