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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Review of ANP-10303P, "SIVAT: TELEPERM XS™ Simulation Validation Test Tool Topical Report," (TAC NO. ME1503)

Ref. 1: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Request for Review and Approval of ANP-10303P, SIVAT: TELEPERM XS™ Simulation Validation Test Tool Topical Report," NRC:09:063, June 11, 2009.

Ref. 2: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Review of ANP-10303P, SIVAT: TELEPERM XS™ Simulation Validation Test Tool Topical Report (TAC NO. ME1503)," NRC:10:001, January 4, 2010.

Ref. 3: Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Review of ANP-10303P, SIVAT: TELEPERM XS™ Simulation Validation Test Tool Topical Report (TAC NO. ME1503)," NRC:10:057, June 17, 2010.

AREVA NP Inc. (AREVA NP) submitted ANP-10303P, Revision 0, "SIVAT: TELEPERM XS™ Simulation Validation Test Tool Topical Report," for review and approval in Reference 1. The NRC conducted an audit in Alpharetta, GA. The audit was performed to provide additional support for the safety evaluation for ANP-10303P. One of the objectives of the audit was an evaluation of the software development and configuration management control processes that were used for the SIVAT software development. The NRC also reviewed the following documents as part of that audit objective:

- Rahmenlastenheft: TXS-Simulator (KWU NLL4/98/042)
(translated title: General requirements specification: TXS simulator)
- Lastenheft SIMM (KWU NLL4/98/068)
(translated title: Requirements specification: SIMM)
- TXS-Pflichtenheft, Version 01.21: Generator CATS-SDE für die TXS-Simulationsumgebung (KWU NLLZ ST/99/023b)
(translated title: TXS design specification, version 01.21: Generator CATS-SDE for the TXS simulation environment)
- Lastenheft: Simulation Development Environment (KWU NLL4/98/049)
(translated title: Requirements Specification: Simulation Development Environment)

The NRC requested that additional portions of these documents be translated and added to AREVA NP document NLTC-G/2009/en/0069 A, "TELEPERM XS Simulation tools - translation of selected chapters from requirements and design specification documents from the initial

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development," which was previously provided by Reference 2. AREVA NP committed to provide this information by July 23, 2010 in Reference 3.

The requested translations are provided in an enclosure to this letter in AREVA NP document NLTC-G/2009/en/0069 B, TELEPERM XS Simulation tools - translation of selected chapters from requirements and design specification documents from the initial development, dated July 9, 2010. A cross reference between the requirements traced in the audit and the translated documents is provided in a separate enclosure.

AREVA NP considers some of the material contained in AREVA NP document NLTC-G/2009/en/0069 B to be proprietary. As required by 10 CFR 2.390(b), an affidavit is enclosed to support the withholding of the information from public disclosure. Proprietary and non-proprietary versions of the document are enclosed.

If you have any questions related to this submittal, please contact Mr. Mark Burzynski, Manager, Product Licensing. He may be reached by telephone at 434-832-4695 or by e-mail at Mark.Burzynski@areva.com.

Sincerely,


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

Enclosures

cc: H. D. Cruz
R. Stattel
Project 728

AFFIDAVIT

STATE OF WASHINGTON)
)
COUNTY OF BENTON) ss.

1. My name is Alan B. Meginnis. I am Manager, Product Licensing, for AREVA NP Inc. and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3. I am familiar with the AREVA NP information contained in the NLTC-G/2009/en/0069 B, TELEPERM XS Simulation tools - translation of selected chapters from requirements and design specification documents from the initial development, dated July 9, 2010 and referred to herein as the "Document." Information contained in this Document has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

4. This Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by AREVA NP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in this Document as proprietary and confidential.

5. This Document has been made available to the U S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is

requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information".

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:

- (a) The information reveals details of AREVA NP's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

The information in this Document is considered proprietary for the reasons set forth in paragraphs 6(b), 6(c) and 6(d) above.

7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside AREVA NP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

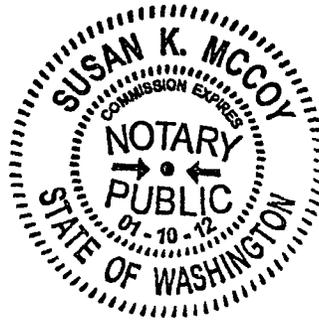
8. AREVA NP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.

Alexis McCoy

SUBSCRIBED before me on this 20th
day of July, 2010.

Susan K. McCoy
Susan K. McCoy
NOTARY PUBLIC, STATE OF WASHINGTON
MY COMMISSION EXPIRES: 1/10/12



AREVA NP RESPONSE to REQUIREMENTS TRACING THREAD AUDIT

ANP-10303, "SIVAT: TELEPERM XS™ SIMULATION VALIDATION TEST TOOL

TOPICAL REPORT" (TAC NO. ME1503)

1. Code Generation related requirements (based on TELEPERM XS SIVAT-TXS Simulation Based Validation Tool User Manual Section 4, "Creating and Configuring the TXS Simulator")

- a. When the Code Generator is called from the Welcome mask, the systems hardware information is retrieved from the Space Project database.

This requirement is implemented as part of the graphical user interface (GUI). The CATS-SDE tool passes the selected system hardware via command line options to the TXS code generators which check if that specified hardware is available to selections. The list of systems hardware in the GUI permits the user to specify the hardware without typing in these strings. In the event unavailable system hardware is selected, the TELEPERM XS code generators abort the code generation with an associated error message, which causes CATS-SDE to abort the SIVAT code generation/adaptation as well.

- b. The Working Directory path is assigned based upon the project and cannot be changed by the user.

The CATS-SDE tool allows specifying the target directory of a SIVAT code generation via the option "-into <dir>". The GUI does not allow changing this path so that users store their simulators in a well defined path. This path is deduced from the directory structure for TELEPERM XS projects. The requirement about how and where the generated simulator should be stored is described in:

- Rahmenlastenheft: TXS-Simulator (KWU NLL4/98/042)
 - A general note in section (second list item) about the places, where the projects data is stored on TELEPERM XS service unit or engineering server.
 - Figure 6 in Section 2.2.4 shows a directory structure in principle on how the generated files should be stored.
- Lastenheft SIMM (KWU NLL4/98/068)
 - A reference to figure 6 of Rahmenlastenheft: TXS-Simulator in the last list item of Section 2.2.1, Item 1 "Selecting of Files".
- TXS-Pflichtenheft, Version 01.21: Generator CATS-SDE für die TXS-Simulationsumgebung (KWU NLLZ ST/99/023b)
 - The Design description for CATS-SDE describes the option "-into" which allows the user to define the target directory for the generation of the SIVAT simulator in Section 2.2.1.4.1, Item 1 and the text after the list, including figure 7).

- c. When the "Make Interface Model check box is selected, two models are created from the data in the interface file for signal conversion and are linked to the simulator.

Two models are one for input signals and one for output signals. These models can be used for two tasks.

- i. Conversion from physical signal values to electrical signals values as done by the measuring or actuating periphery.

Usually, analog input signals that hold electrical values used by the input boards are converted into physical units inside the function diagrams. So called MRC function blocks can be used for this conversion. They allow a linear conversion for analog signals. The following logic in the function diagram is implemented using these physical units.

So when just simulating the TELEPERM XS CPUs the input signals would have to be set using electrical values. This might be inconvenient because the requirements for the TELEPERM XS application might be defined using physical units. So these models can be used to simulate the inverse conversion of signals that is done by the MRC function blocks.

For the generation of these models, the user can choose to whether use the inverse conversion which is determined from the parameterization of the MRC blocks or the user can define such a conversion manually by specifying a gain and an offset for the linear conversion.

- ii. Connection to process models using the input and output signals of the TELEPERM XS system.

This is done by assignments between the TELEPERM XS input/output signals and signals of the process models. This assignment has to be defined by the user.

Documents:

- Lastenheft SIMM (KWU NLL4/98/068)
 - Section 2.2.1, item 7 "Coupling of interface signals" describes the coupling of process models via input/output signals by using the interface models.
 - TXS-Pflichtenheft, Version 01.21: Generator CATS-SDE für die TXS-Simulationsumgebung (KWU NLLZ ST/99/023b)
 - Section 2.1.3, in the end of the section, states a generation requirement for a conversion from electrical to physical values and vice versa.
 - Section 2.2.1.8 describes the generation of the interface models in depth.
- d. When the "No Voter" check box is selected, the effects of two voter subsystems in the event of a fault are suppressed.

This option allows disabling the separate simulation of a second voter subunit. This was introduced for performance reasons because simulating both voter subunits does not have a functional effect (since no malfunctions are assumed).

This is not a requirements requested in the requirements documents. It was analyzed and described in the design specification CATS-SDE.

- TXS-Pflichtenheft, Version 01.21: Generator CATS-SDE für die TXS-Simulationsumgebung (KWU NLLZ ST/99/023b)
 - Chapter 2.2.1.4.1, list item 10 describes the option `-no_voter`
 - Chapter 2.2.1.5.1, “Analyzing the runtime environment,” third paragraph, describes the difference between voters and single CPUs and how signals and messages are handled by a voter. It also describes that (and why) variables have to be renamed if both voter subunits are simulated.
2. Simulation Related Requirements (based on TELEPERM XS SIVAT-TXS Simulation Based Validation Tool User Manual Section 5, “Simulation”)

Background

The simulation control system SDE is a third party product that was developed by the company SimPower for the use on HP-UX workstations. Some documentation was provided by SimPower regarding the SDE tools DBE, DBB and SimEx and a user manual for the SDE product in the whole. When the TXS tools were ported to the Linux operating system the right on the SDE product was purchased by AREVA and the tool was ported to Linux. No functional changes were done to the product at that time. It was integrated into the TXS configuration management and change procedure. SDE provides the basic SCS functionalities for SIVAT, like processing the simulation models (run/stop), saving and restoring ICs (initial conditions), accessing (read/write) the simulation variables, and so on. SDE provides an interface to extend the basic user interface by providing a GUI and Tcl/Tk commands that are processed by the simulator shell. Actually, the GUI is also some script that is processed by the simulator shell. The GUI and some convenience functions were added by AREVA.

Requirements for the SCS (SDE) are described in the document Lastenheft SDE (KWU NLL4/98/049). Most of the requirements were implemented by SimPower in the basic SDE tools. Some requirements were implemented by using the interface for extensions.

- a. When the “Go For” button is pressed on the user interface window, the simulation runs for the duration specified in the text entry box to the right of the button. When the time elapses, the simulator is set to the FREEZE state.

This requirement is defined in Lastenheft SDE (KWU NLL4/98/049) Section 2.2.1.3, Item 2, list item 4. As stated right below the list, the command names are just suggestions that might be subject to changes, but the described functionality must be implemented.

- b. When the Save IC button is selected, the Save IC window opens which allows the operator to save the state of all values at a specific point in time to a file.

Initial Conditions (ICs) are saved by dumping the complete simulation memory (simulation database) into a file. The requirement is defined in Lastenheft SDE (KWU NLL4/98/049) Section 2.2.1.3, Item 2, list items 6 and 7.

- c. The monitoring window contains an option to allow the operator to change the status or value of any variable being monitored.

The requirement to read and write any simulation variable is described in:

- Rahmenlastenheft: TXS-Simulator (KWU NLL4/98/042)
 - Section 2.2.1.2, end of the section, list item 2 and 3
 - Lastenheft SDE (KWU NLL4/98/049)
 - Section 2.2.1, end of the section, first bullet item is described that this feature was developed in cooperation of SimPower and AREVA.
 - The second bullet in the list describes, that it must be possible to read and write the simulation variables for supporting display functions.
- d. During simulation, the values of all variables specified with plot are written to the file in the plot-open command.

The requirement is listed in:

- Rahmenlastenheft: TXS-Simulator (KWU NLL4/98/042)
 - Section 2.2.1.2, end of the section, list item 2
- Lastenheft SDE (KWU NLL4/98/049)
 - Section 2.2.1.3, item 3, list items 7, 8 and 9

Implementation was done by AREVA using the extension interface of SDE.

- e. Command line requirement: Ramp function description. Process for ramping a signal.

The requirement is listed in:

- Rahmenlastenheft: TXS-Simulator (KWU NLL4/98/042)
 - Section 2.2.1.2, end of the section, list item 2
- Lastenheft SDE (KWU NLL4/98/049)
 - Section 2.2.1.3, item 3, list item 4

Implementation was done by AREVA using the extension interface of SDE.