

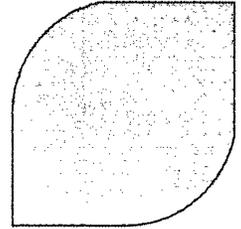
Integration of SIVAT into Requirements Traceability Matrix

**NRC Audit
June 8-10, 2010
Alpharetta, GA**

AREVA NP Non-Proprietary



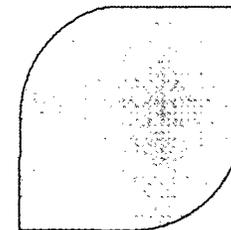
Current RTM Plans



► Currently

- ◆ **AREVA follows Operating Instruction OI-1591, TXS System - Requirements Traceability Matrix, for the development of the RTM**
- ◆ **AREVA developed two Requirements Traceability Plans for the ONS RPS/ESFAS upgrade project**
 - Software Requirements Traceability Plan, and
 - Hardware Requirements Traceability Plan

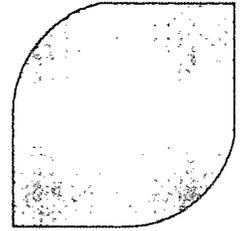
Future Projects will have Similar Documentation for both Hardware and Software (Appropriate to the Project Requirements)



Level of Tracing

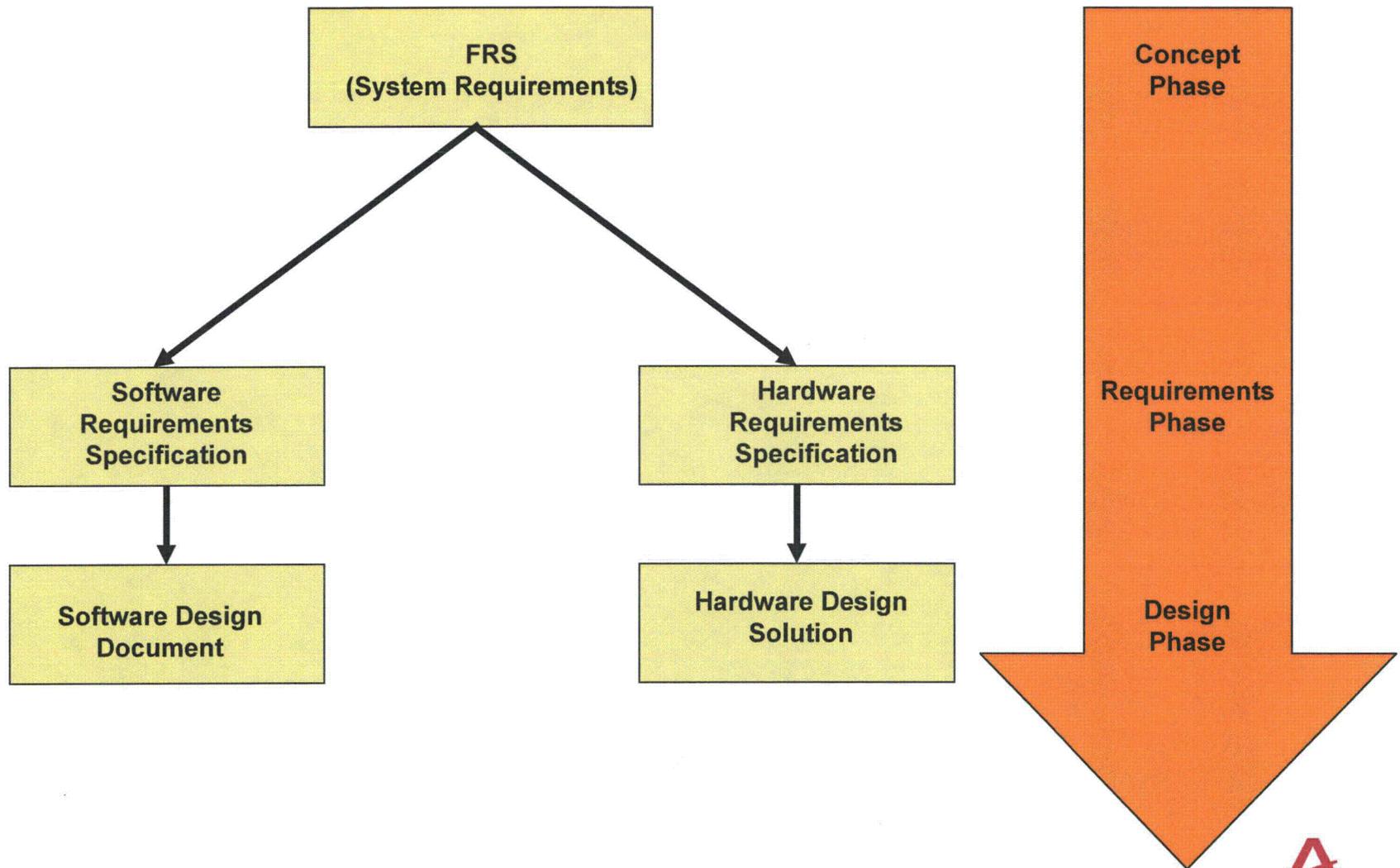
- ▶ **The RTM provides every requirement**
- ▶ **The traces include:**
 - ◇ **software requirements**
 - ◇ **software design description**
 - ◇ **actual code**
 - ◇ **hardware requirements**
 - ◇ **hardware design**
 - ◇ **inspection**
 - ◇ **analysis**
 - ◇ **tests**
 - system and Acceptance Testing (FAT)
 - software Acceptance Test with SIVAT (Black Box)
 - software Acceptance Test (In Conjunction with White Box Testing)

Software and Hardware Design Documents Tracing Process

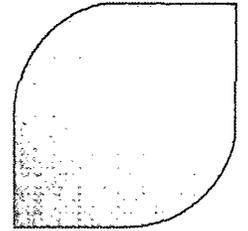


- ▶ **Software and Hardware Tracing for the design documents will be unchanged from the current process with the introduction of TELEPERM XS™ Simulation Validation Test Tool (SIVAT).**
 - ◇ **Tracing from the SRS to the SDD**
 - ◇ **Tracing from the HRS to the HDS**

Software and Hardware Design Documents Tracing Process



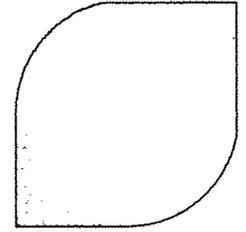
Validation Tracing Process



► With the Addition of Approved Simulation Testing

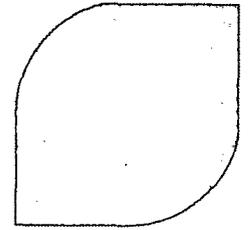
- ◇ **Software Validation Tracing will be performed in two ways**
 - To the Simulation Test Documents (i.e. SIVAT Test Specifications, and Test Procedures)
 - To the Factory Acceptance Test Documents (i.e. FAT Specifications, and FAT Procedures)
- ◇ **Hardware Validation Tracing Process will be unchanged**
 - To the Factory Acceptance Test Documents, Inspection or Analysis

Future Validation Tracing Process



All Simulation Testing, including that performed at the same time as Integration testing, is performed only on released software

Future Validation Tracing Process

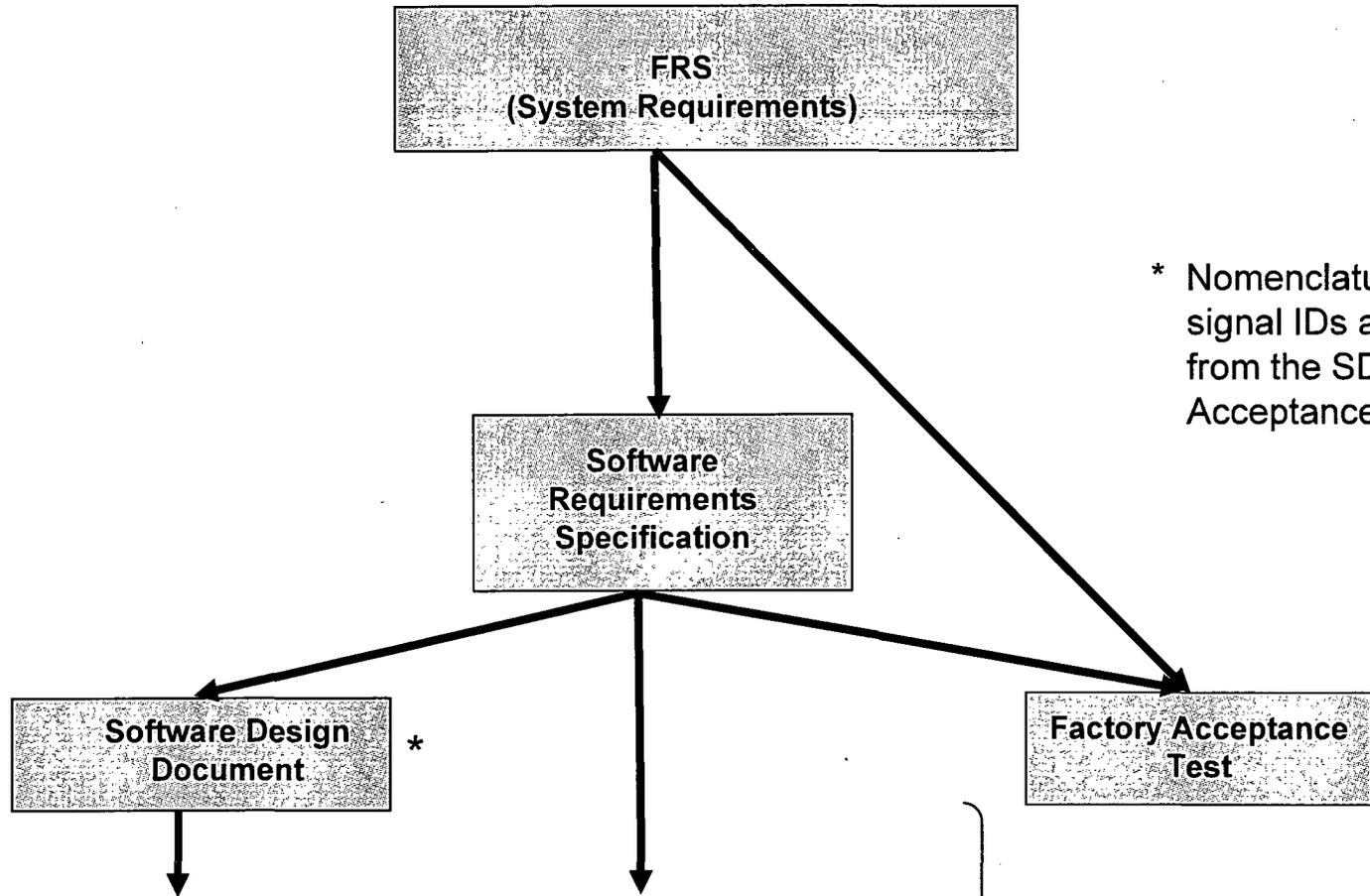
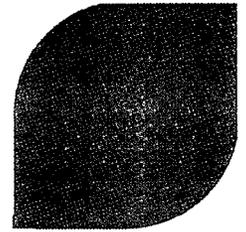


- ▶ **Tracing to Factory Acceptance Test Documents will be performed for Requirements such as:**

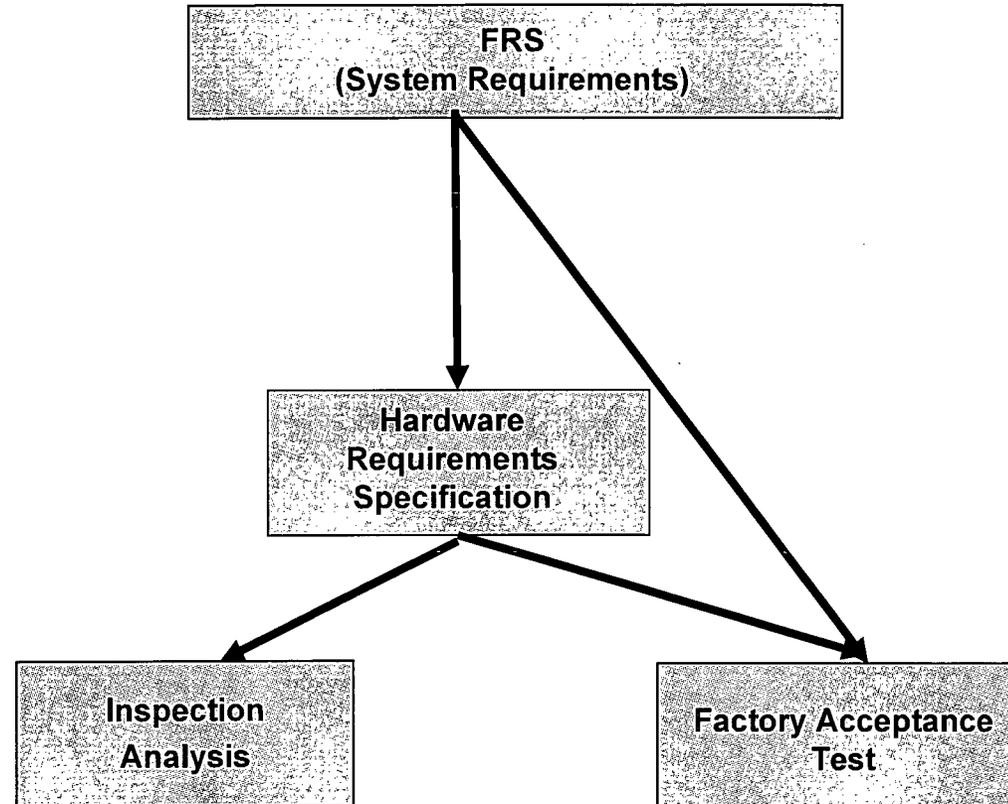


- ▶ **Note that all requirements will be traced to the Test Case to ensure the requirement is satisfied**
 - ◆ Requirement Test Cases will be denoted as such for clear identification

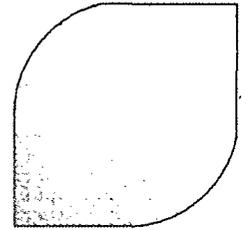
Software Validation Tracing Process



System/Hardware Validation Tracing Process (Unchanged)



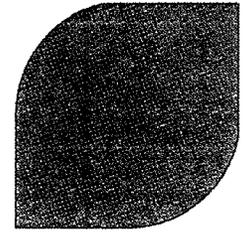
Tracing Examples



Item	From	To	Comments	Test Specification	Test Procedure
1951	FRS-7.9.P1.S1	SRS-3.7.7.1	The response time for the TXS rack/processing equipment shall be < 425 msec for pressure change input for Function 7.	Not Traced	RPSRESPPROC-3.3.4.2-Steps1-8

**FRS→SRS→System and Acceptance Test (FAT)
Unchanged (Black Box)**

Tracing Examples

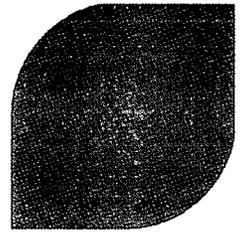


Current
Tracing Methodology

Future Plan
Tracing Methodology

FRS → SRS → System and Acceptance Simulation Testing
with SIVAT (Black Box)

Tracing Examples



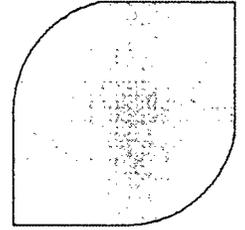
**Current
Tracing Methodology**

**Future Plan
Tracing Methodology**

**FRS→SRS→ System and Acceptance Simulation- Test
(In Conjunction with White Box Testing)**



Summary

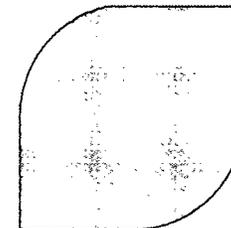


► With the Introduction of SIVAT

- ◆ **SIVAT Simulation Testing Validates that the Application Software meets the I&C Functional Requirements**
- ◆ **The SIVAT simulation test of software provides benefits for detecting errors early**
- ◆ **The risk for missing requirements or wrongly implementing requirements is minimized**

► Impact of the SIVAT to the RTM

- ◆ **Update the Requirement Traceability Plans and Methodologies to reflect the integration of SIVAT**
- ◆ **Update the Application Software Requirements Tracing Process**
- ◆ **No changes to the Hardware Requirements Tracing Process**



Thank you!

QUESTIONS?