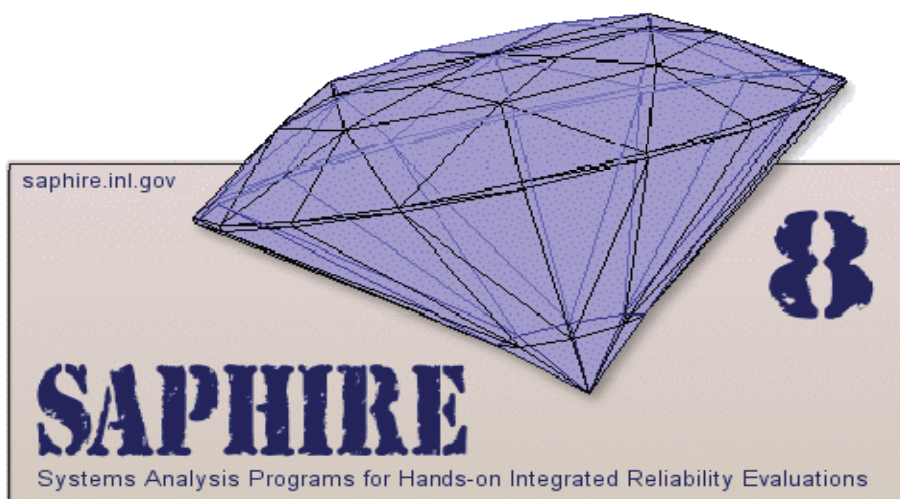


Independent Verification and Validation of SAPHIRE 8 System Test Plan

February 2010



The INL is a U.S. Department of Energy National Laboratory
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1.0 Executive Summary

The purpose of the Independent Verification and Validation (IV&V) role in the evaluation of the SAPHIRE System Test Plan is to assess the approach to be taken for intended testing activities associated with the SAPHIRE software product. The IV&V team began this endeavor after the software engineering and software development of SAPHIRE had already been in production.

The requirements for IV&V review were extracted primarily from the NUREG but also included an examination of best software engineering methods provided in the IEEE Standard for Software Verification and Validation. IV&V developed a checklist that mapped these requirements with these standards which was used in the evaluation. The evaluation criteria and the results of the assessment are identified in section 3 of this document.

Per the requirements and document outline provided in the SAPHIRE IV&V Plan, this report and all subsequent reports will be included as attachments and/or background evidence of the evaluation as well as the results of the assessment.

2.0 Background Information

NUREG/BR-0167, Software Quality Assurance Program and Guidelines, requires the development of a document prescribing the approach to be taken for intended testing activities.

Testing is the process of exercising or evaluating a software product or part of a software product by manual or automated means to verify that it satisfies specified requirements or to identify differences between expected and actual results.

This report provides an evaluation of the System Test Plan. The System Test Plan is intended to identify the items to be tested, the requirements being tested, the testing to be performed, test schedules, personnel requirements, reporting requirements, evaluation criteria, and any risks requiring contingency planning.

Independent Verification and Validation (IV&V) evaluates and assesses the processes and products developed during each phase of the Software Development Life Cycle (SDLC). The SAPHIRE 8 development team is implementing a “spiral” rapid application approach to the product development. One of the roles that IV&V performs, regardless of the development methodology, is to analyze products developed throughout the development process. The intent is to provide a level of confidence to the sponsor that the quality of the software product and supporting documentation is built into the software, not tested in. Evaluating the supporting documentation for each product is one aspect of providing this level of confidence.

IV&V supports and is complementary to the Quality Assurance, Project Management, and product development activities. To achieve this support, IV&V must also evaluate the processes identified in the documentation to ensure that the development team is implementing the processes and methodology that ensures a high-level software product.

Due to the spiral approach implemented for the software development, it is expected that the System Test Plan will evolve as the SAPHIRE 8 product matures. Therefore, IV&V will evaluate each iteration of the System Test Plan.

To provide direction in the evaluation process, IV&V has developed a checklist to support the requirements for the SDLC. The Project Plan requirements used for the analysis of the System Test Plan is contained in a checklist that is included in the SAPHIRE 8 Software Independent Verification and Validation Plan (INL/EXT-09-15649). The evaluation criteria for the System Test Plan have been extracted from the checklist contained in the “IV&V Plan” and included in section 4 of this report. A summary of the findings is provided in section 3.

3.0 Summary of Findings

An Independent Verification and Validation evaluation of the System Test Plan Document ID: INL/EXT-09-16455 for SAPHIRE 8 was performed using the checklist contained in section 4.0. The checklist was extracted from the SAPHIRE 8 Software Independent Verification and Validation Plan Document ID: INL/EXT-09-15649. The checklist refers to the specific parts of the NUREG/BR-0167 Software Quality Assurance Program and Guidelines requirements the SAPHIRE 8 System Plan must satisfy. Of the three criteria listed for the required information to be provided within the SAPHIRE 8 System Test Plan all criteria were satisfied.

4.0 IV&V Evaluation Checklist

SYSTEM TEST PLAN		
Criteria	Has a System Test Plan been initiated?	
Priority: 1	NUREG/BR-0167 Section 4.9.1	
Pass	X	Comments
Fail		Refer to the SAPHIRE Version 8 System Test Plan Document ID: INL/EXT-09-16455.
N/A		
Criteria	Does the System Test Plan identify WHAT test activities will be performed?	
Priority: 2	Appendix B, Glossary (Test Plan)	
Pass	X	Comments
Fail		Section 1.2 Beta Testing states “ <i>Beta testing is following a beta test plan.</i> ” Section 3 Independent Verification and Validation (IV&V) states “ <i>For the high level areas, the IV&V team will be reviewing and testing as described in the NUREG/BR-0167 and IEEE STD 101202004...</i> ”. Section 4 Software Acceptance Test Plan states “ <i>The Software Acceptance Test Plan documents the acceptance tests that the INL will use to demonstrate that SAPHIRE 8 is ready for official release.</i> ”
N/A		
Criteria	Does the System Test Plan identify the resources, team responsibilities, and techniques to plan, develop, and implement test activities through the life-cycle, and identify testing techniques and test phases?	
Priority: 3	NUREG/BR-0167 Section 5.2.4	
Pass	X	Comments
Fail		Section 1.1 Introduction, paragraph 2 states “ <i>The SAPHIRE System Test Plan (STP) plan is structured around NUREG/BR-0167, Software Quality Assurance Program and Guidelines, (February 1993).</i> ” The criterion is also satisfied in section 1.2 Beta Testing, section 3 Independent Verification and Validation (IV&V), section 4 Software Acceptance Test Plan and Life cycle Phase listed in Table 1 IV&V Tasks Based on NUREG/BR-0167.
N/A		