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EXECUTIVE SUMMARY

This Document No. NEDC-30885, entitled, "Generic ERIS (Basic RTAD) Software Validation", dated April 1985, describes General Electric's program to evaluate and test the integrated software, data bases and command files which, with hardware components, comprise a portion of GE's Emergency Response Information System (ERIS). ERIS is the commercial name for GE's Real Time Analysis and Display system and Transient Analysis and Recording System.

The purpose of this validation program was to demonstrate through static and dynamic testing and analysis that ERIS meets the generic functional, performance and interface design requirements placed on the system by General Electric, which designed and built the ERIS system.

The scope of the validation and verification testing reported here is to establish performance parameters for the ERIS system. Validation of the correctness of the analysis and display of plant parameters is accomplished during other validation activities, including software integration tests, data base validation, pre-operational tests and startup tests. Data was taken during the validation and verification testing to facilitate software problem resolution and to assure that the plant startup validation activities would be successful.

Results of the validation and verification testing are as follows:

1. The time delay between the time a new display is requested and the time the display first becomes available on the display terminal is 3 to 5 seconds, depending on the complexity of the display.

2. Average null time (CPU idle time) during measurement intervals of 10 to 30 minutes is 46% to 50% depending on the complexity of the test scenario.

3. Average sensor update time (the time delay between the time a sensor changes to the time a display parameter changes) is typically 0.4 to 2.4 seconds with a maximum of 6.0 seconds.

These results were obtained without performing parameter trend calculations. A Software Problem Report has been written requiring a design change to the method of calculating and storing trend data. The redesign method will provide trend analysis without degrading the system's performance with respect to the required performance limits.

Analysis of the reliability of the system hardware during the validation and verification testing confirmed that the assumptions used in the original reliability analysis are valid.

In summary, the results of these tests confirm that the ERIS (Basic RTAD) system performs as designed.

This document also responds to Section C and H of Reference 4 and, therefore, includes the following appendices:

- Validation matrix
- Major ERIS verification and validation activities
- Quality-related practices and procedures GE followed in this validation program
- Summary of typical software problems GE encountered during this validation program

TABLE OF CONTENTS

1. SCOPE

This report documents the software validation of the Basis Real Time Analyses and Display (Basic RTAD) functions of the generic Emergency Response Information System (generic ERIS). The following Generic ERIS (Basic RTAD) functions are beyond the scope of this document.

- Safety System Status Indication
- Digital Indication of Calculated Reactor Pressure Vessel (RPV) Temperature

Generic ERIS software validation is one of the several major Verification and Validation (V&V) activities. Other major ERIS V&V activities are identified in Appendix B.

2. DEFINITIONS AND ACRONYMS

The meaning of terms and acronyms as used in this report are defined to be as follows:

ADS — Automatic Depressurization System

Basic RTAD — Basic Real Time Analysis and Display (RTAD) is a computer based real time analysis and display system. It is designed to display following "Emergency Operating Procedure" derived displays on power plant control room.

- RPV Control Display
- Containment Control Display
- Critical Plant Variables
- Two-Dimensional Plots
- Trend Plots
- Validation Status Displays

This system performs the following functions

- Display Format Processing
  - Display Format Verification
  - Format Installation
  - Terminal Initialization
  - Format Report Configuration
    - * Terminal Status Report
    - * Display Parameter List Report
    - * Display Directory Report
- Dynamic Display Processing
  - Display Interface
  - Format Selection
  - Data Accumulation
  - Security Check

- Historical Data Accumulation
- Active Point Data Processing
- Critical Error Processing

Detailed basic RTAD functions are as defined in column 1 of the table in Appendix A.

CCI	Configuration Change Information
CRD	Control Rod Drive System
CST	Condensate Storage Tank
DG	Diesel Generators
Dynamic Test	Same as Validation Test
EOF	Emergency Operations Facility
EPG	Emergency Procedure Guidelines
ERIS	Emergency Response Information System
Gen. Temp. Mon.	Generator Temperature Monitoring
Generic ERIS	ERIS system which forms the basis for implementation of plant unique ERIS systems
GCMACC3	Habitat Display
GCMANIF	Habitat Display
GE$DATA:ASCAN.DAT	Data File for Scan Data
HPCS	High Pressure Core Spray
Habitat	Data Base Management Software
Integration Test	See Section 4.2 of this report
MSIV	Main Steam Insolation Valves
MSL	Main Steam Line
MTBF	Mean Time Between Failure
NDL	Nuclear Data Link

Pantalk	Habitat Command
P&ID	Piping and Instrument Diagram
PDDB	Point Definition Data Base
Plant/Site Unique	An ERIS system which satisfies both regulatory and customer requirements
Repair Class	Category of Mean Time to Repair
RECIRC	Reactor Recirculation System
RCIC	Reactor Core Isolation Cooling System
RHR	Residual Heat Removal System
RPV	Reactor Pressure Vessel
RTAD	Real Time Analyses and Display System
SPMS	Suppression Pool Monitoring System
SPR	Software Problem Report
SPR Punch List	A compilation of major software problems with action plan to correct the problems.
SRV	Safety Relief Valve
Static Test	See Integration Test
Target System	A computer system consisting of software (which is being subjected to test), data bases, command files and computer hardware (which is used to execute the software)
Test Specimen	Software being subjected to test, associated data bases and command files.
TEST04	Test Sample Plan Data Base
Test System	Computer system which is used to generate simulated data and provide inputs to the target system.
TLCDRRT	Test aid software for real time data retrieval
TRA	Transient Recording and Analysis
USERDB	User Data Base

V&V	Validation and Verification
V&V Simulator	Software used for generation of simulated input data (resembling plant dynamics with multiple failures and operator actions) to the target system for ERIS validation testing.
Validation	Evaluation and test of integrated hardware and software system (software, data bases and command files) to determine compliance with functional, performance and interface requirements.
Validation Test	Dynamic testing performed for validation of the software. (Note validation program also includes static testing and evaluation by inspection and analysis.)
Verification	Review of documents and design to ensure that the system requirements are correct and the design meets the requirements.

3. OBJECTIVE

The objective of the software validation program is to certify that the test specimen (identified as generic ERIS master software), when integrated correctly with correct data bases and installed on a correctly functioning computer hardware system, will operate in accordance with the design specifications (to the extent defined in Reference 16) with exceptions noted in "The ERIS Software Problem Report" (Reference 15).

4. DESCRIPTION

4.1 GENERAL

Validation is the test and evaluation of the integrated hardware and software system to determine compliance with the functional, performance and interface requirements. The program was conducted in accordance with the ERIS/OMNIBUS V&V Plan (Reference 10) and the validation matrix was prepared to demonstrate compliance to the ERIS Validation Requirements (Reference 1).

An overview of the General Electric ERIS Software Validation Program is shown in Figure 1. The program consists of four parts:

1. Integration (static) test
2. Validation (Dynamic) test
3. Inspection and analysis
4. Field Verification and Tests

The Integration (STATIC) test, the Validation test and the Inspection and Analysis were performed for Validation of generic software. Field Verification and tests are conducted to validate the plant unique system and are not necessary for validation of the generic ERIS software. Hence, Field Verification was not conducted as a part of this program.

A Test Plan and Procedure was prepared for each test which describes how the testing is to be performed, how problems are reported and retested, and which aspects of the design are to be tested. The Test Plan and Procedure clearly documented the conduct of the test and included the following items:

a. Test Objectives
b. Hardware/Software required and configuration
c. Procedure
d. Acceptance criteria

The test outputs included the following:

1. Test log
2. Test results

The test results were evaluated by the test team and/or a engineering review team. Open items and Software Problem Reports were generated and forwarded to the design team (using the practices and procedures contained in the

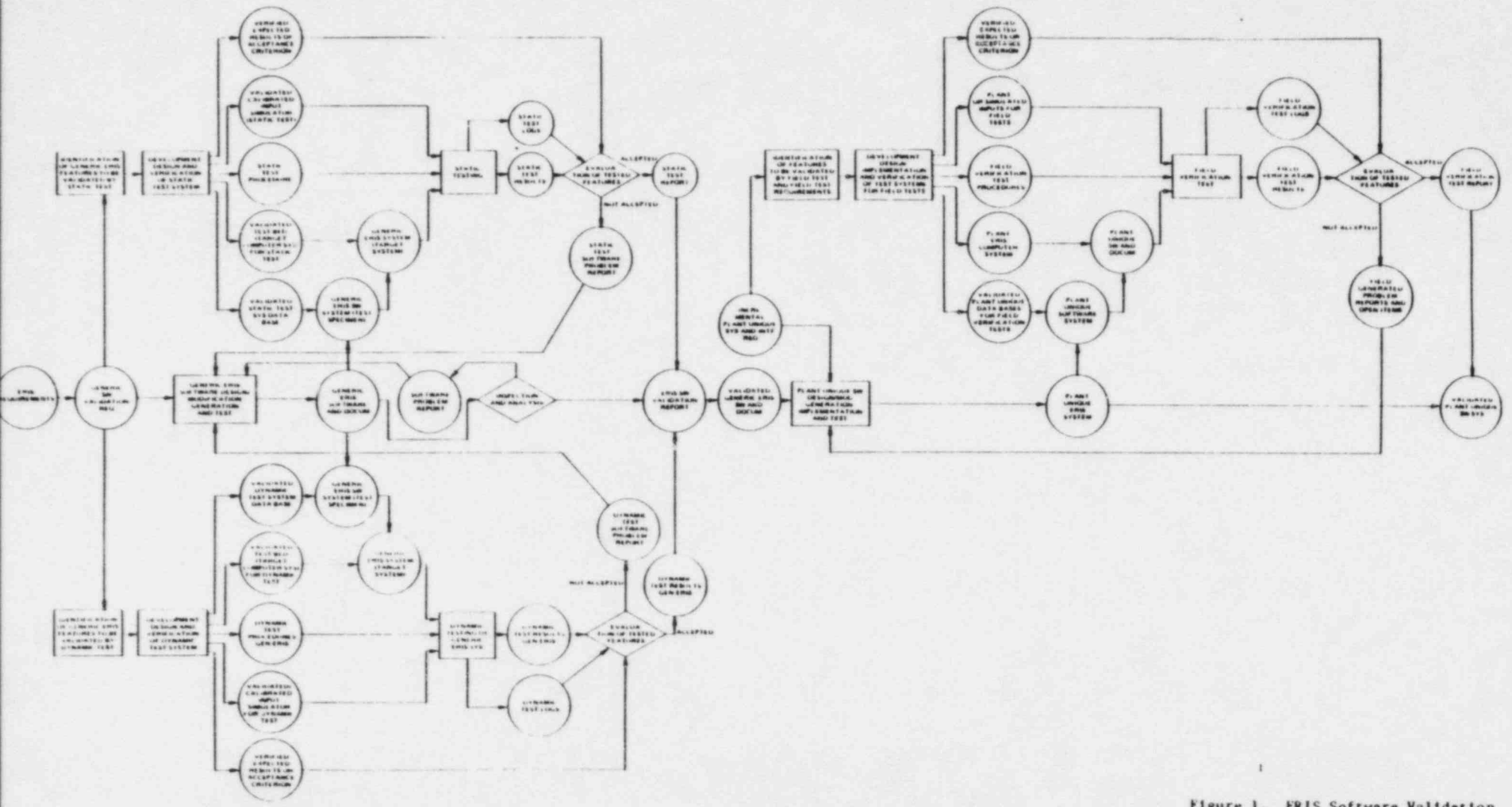

Figure 1. ERIS Software Validation Program

General Electric Company Engineering Operating Procedures) for corrective action. Required corrections were made by the design team and modified software was submitted for re-validation. New revisions of the software were re-validated. Re-validation included analysis and partial testing or complete testing based on the nature of the change.

The inputs to the software validation program consists of the generic software validation requirements document, and un-validated software executable tapes. The output, in addition to this document, consists of the validated software (tapes) and the software listings which document the software to be validated.

Validated software is identified as "Generic ERIS (Basic RTAD) Master Software - 30885". The software listings (documenting the software), test plans, procedure logs, results, evaluation and results acceptance are achieved.

Major documented engineering operating procedures and product quality practices and procedures which were followed during the V&V Program (to the extent they are applicable) are summarized in Appendix C.

4.2 INTEGRATION (STATIC) TEST:

Integration testing was performed to verify that the entire software package (for each functional block) correctly implements the design and satisfies the software requirements. Combinations of modules which have previously been tested were assembled and tested in a step-wise (one at a time) fashion. The entire package was tested after each new integration of modules in the overall structure. At the final stage of integration tests, the individual functional blocks were integrated and tested as a single computer program product.

As the test cases were generated, the actual results of each were checked to verify that the expected results were achieved. Problems identified as a result of integration testing were documented on Software Problem Reports. The test procedures and test case listings were placed in the Design Record file.

Integration testing of each functional block was considered complete when all modules had been incorporated and all tests in the test plan had been completed. Among the criteria for completion of integration testing were:

a. All software requirements are tested over both normal and abnormal input cases.

b. All module invocations are exercised at least once for each possible alternative response.

4.3 VALIDATION (DYNAMIC) TEST:

This test, in conjunction with the Static (Integration) Test was used for evaluation of the integrated (hardware and software) system to determine compliance with the functional and performance requirements. Thus this test provides overall assurance that the required capabilities have been implemented. The testing was approached from the ultimate user's viewpoint. The objective of the test was to establish that the system, when subjected to realistic plant dynamics over a sustained time period, will continue to provide generally used functions with acceptable performance. Typical tests which were performed as part of dynamic system testing include the following:

a. Demonstrate acceptability of sustained system performance when subjected to the dynamics of the plant as represented by a set of simulated typical power plant transients.

b. Verify that multiple functions can be simultaneously performed and that the system is free of multiple function interaction or timing problems.

c. Verify that system response/execution times and the accuracy of the outputs are acceptable.

The testing activity was guided by the Validation Test Requirements Specification and Validation Test Plan and Procedures that were prepared during the requirements analysis task. Among the criteria for completion of testing are:

a. All tests are run with fully operational [illegible]ware and hardware.

b. All tests are run per approved and [illegible] test procedures. The procedures are based on the End User Manuals and allow verification of the End User Manuals during the test.

c. All test data is archived in the appropriate DFRs. These include inputs, outputs, the test procedures, any pertinent information on the test execution, and information on the hardware and software status prior to test.

d. Test results are accepted by the engineering review process.

The dynamic testing required use of two Vax Computer systems. The dynamic test setup is shown in Figure 2. One computer was used to execute the target system software (test specimen). The other computer was used as a power plant simulator. The transient data (with multiple failures and operator actions) was transferred from a power plant simulator to a magnetic tape. The site computer hardware configuration is contained in the site computer Data Acquisition Hardware Data Base and Point Definition Data Base. The two data bases were transferred to another magnetic tape. These magnetic tapes were then processed with the validation test simulator generator

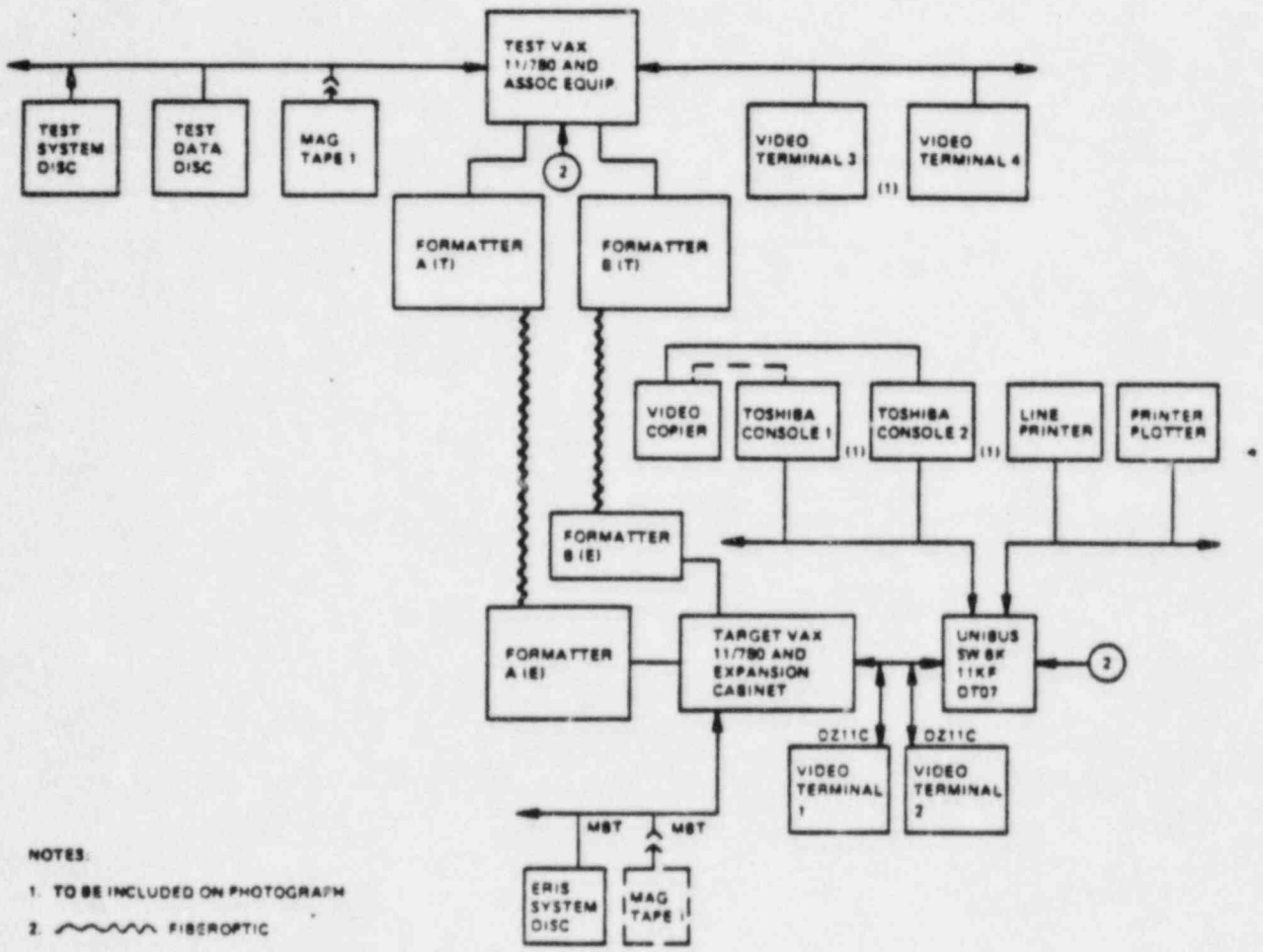

Figure 2. Test Equipment and Computer Configuration for ERIS Validation Test

software and the resulting data was loaded on the validation test simulator disk. The simulator disk, was installed on the test system computer. The test computer system provided measured inputs to the target machine in an similar manner as a power plant will do (for the set of transients contained in the simulator).

4.4 SUMMARY OF SOFTWARE PROBLEMS AND THEIR RESOLUTION

During generic ERIS (basic RTAD) software validation, software errors were discovered. Since validation is primarily a testing activity the problems were discovered in static/dynamic test phases as opposed to the inspection and analysis phase. A summary of major typical software problems discovered during the validation program is included in Appendix D.

Methodology for software problem reporting and resolution is identified in Item 6 of Appendix C. In summary, software problems are documented in one or more of the following document types.

- Software Problem Report
- Field Deviation Disposition Request
- Corrective Action Report

The documented problems were forwarded to the design team, which corrected/modified affected portions of the system. The schedule for modification/correction was generally governed by the software punch list. Upon correction of the problem, updated software was submitted for re-validation. If the test was not successful, the software was returned to the design team for rework. When the test was successful, the upgraded software was archived in the library and is implemented on affected plant sites using field disposition instructions.

4.5 EQUIPMENT FAILURES AND THEIR IMPACT ON RELIABILITY ANALYSIS ASSUMPTIONS

The validity of assumptions made in Reference 23 for the reliability analysis calculations have been addressed by Reference 24. The following information further substantiates conservativeness of the aforementioned assumptions.

A summary of various computer system hardware failure which were encountered up to the generic ERIS software validation are contained in Reference 17. Also included in it are the failure rate and repair data based on the interval for which the equipment failures were monitored. A comparison of this failure rate and repair data with those contained in Table 2 of Reference 23 indicates that assumptions made in Reference 23 have not been invalidated as a result of additional data obtained up to and during validation test program.

4.6 INSPECTION/ANALYSIS (IA) AND DOCUMENTATION OF COMPLIANCE ESTABLISHED BY IA

It is not practical to validate some of the ERIS design features (functions, capability and performance) by testing. Features in this category, which are included in the ERIS validation requirement specification (Reference 1), were analyzed/inspected to establish their compliance to the design requirements. Simplifying assumptions were made to facilitate the analysis and generally accepted mathematical and analytical techniques were used. Signature of the engineer in Column 4 (Compliance Certification) of the Appendix A table indicates the following:

- All assumptions and observations are contained in the Design Record File.
- The analysis or inspection data and calculations are included in the Design Record File.
- Results and conclusions are summarized and their acceptance has been recorded in the Design Record File.
- Open items (items which have not been resolved and/or accepted) are included in "the ERIS Software Problem Report".

4.7 DOCUMENTATION OF COMPLIANCE ESTABLISHED BY THE TESTS (STATIC/DYNAMIC)

All generic ERIS (Basic RTAD) features (function, performance capability, design parameters) are identified in column 1 of the Appendix A table. The method used to validate the features is indicated in column 3.1 of the table. Column 2 refers to paragraph No. of the Validation Test Requirements Document (Reference 1), in which the validation requirements are specified and provides the interpretation of the validation requirement. Validation approach and acceptance criteria are described in Column 3.2 and 3.3 respectively of the table. The signature of the responsible engineer in Column 4 of the table (Compliance Certification) indicates the following:

- Generic ERIS master software (Reference 13) was used as the test specimen to validate the feature.
- The tests (static and dynamic) were conducted using documented and approved test procedures and said procedures are in compliance with requirements contained in Column 2 of the table.
- Tests were conducted in a controlled fashion and no changes were made to the test specimen during and after the final run of the tests.
- The test specimen and corresponding source listings are archived.
- Record of the tests (test log, test plan and procedures, and test results) have been archived.

- Open items and software problem reports (with exception noted in Reference 15) have been resolved and the test results have been accepted.

- Record of resolution and acceptance of open items and SPRS have been included in the Design Record File.

- Those SPRS, which were judged to be significant and are not resolved and/or accepted, were included in "The ERIS Software Problem Report".

- Significant test results are included in "The Generic ERIS (Basic RTAD) Functionality and Performance Summary".

4.8 FIELD VERIFICATION TESTS:

The objective of this activity is to verify that the system is properly installed and the total site unique system will function and perform per requirements, in the plant environment. These tests are beyond the scope of this report. The installation procedures developed by the suppliers should be reviewed to assess the completeness and throughness with which the system is installed and checked. Additional field installation tests should be performed as required to verify the adequacy, accuracy and completeness of the total system installation. A pre-operational test should be performed to ensure that the system is correctly connected to the plant. A start up test should be performed to verify that all site unique data bases are correct and the system performs correctly when interfaced with the power plant.

5. CONCLUSIONS

Results of the validation and verification testing are as follows:

1. The time delay between the time a new display is requested and the time the display first becomes available on the display terminal is 3 to 5 seconds, depending on the complexity of the display.

2. Average null time (CPU idle time) during measurement intervals of 10 to 30 minutes is 46% to 50% depending on the complexity of the test scenario.

3. Average sensor update time (the time delay between the time a sensor changes to the time a display parameter changes) is typically 0.4 to 2.4 seconds with a maximum of 6.0 seconds.

These results were obtained without performing parameter trend calculations. A Software Problem Report has been written requiring a design change to the method of calculating and storing trend data. The redesign method will provide trend analysis without degrading the system's performance with respect to the required performance limits.

Analysis of the reliability of the system hardware during the validation and verification testing confirmed that the assumptions used in the original reliability analysis are valid.

In summary, the results of these tests confirm that the ERIS (Basic RTAD) system performs as designed.

6. REFERENCES AND SUPPLEMENTAL DOCUMENTS

The following documents were used in preparation of this report. These documents provide detailed information about the applicable topics.

1. ERIS Validation Test Requirements, General Electric Company "Test Specification", 386HA598 Revision 1.

2. U.S. Nuclear Regulatory, Commission, "Clarification of TMI Action Plan Requirements". USNRC Report NUREG-0737, February 1981.

3. General Electric Emergency Response Information System Licensing Topical Report (General Electric GESSAR II SPDS) NEDE-30283-P, November 1983.

4. U.S. Nuclear Regulatory Commission, "Draft SER on the Safety Parameter Display System for GESSAR II", USNRC Docket No. 00007447, December 18, 1984.

5. General Electric "Engineering Operating Procedures", GE Document NEDE-21109.

6. General Electric, Nuclear Services Product Department, Electronic and Computer Products Section, "ERIS Software Management Plan", G-81W-SMP-8430.1-0001, July 1984.

7. General Electric, Nuclear Services Product Department, Electronic and Computer Products Section, "ERIS Configuration Management Plan", G-81W-CMP-8429.5-0001, July 1984.

8. General Electric, "Document Preparation Guide", NEDS-24760.

9. General Electric, "Software Engineering Manual", NEDE-30682.

10. General Electric, "ERIS/Omnibus Validation and Verification Plan" NEDC-30675.

11. General Electric Company, Nuclear Services Products Department, Electronic and Computer Products Section, "ERIS Integration (Static) Test Procedure, "ERIS Generic Test Plan Document", V-81W-GTP-8439.7-000. September 1984.

12. General Electric Company, Nuclear Services Products Department, Electronic and Computer Products Section, "Test Plan, Procedures and Report for the Validation Test of the Generic ERIS (Basic RTAD) Software System", (S) NEDC-30885.

13. General Electric Company, Nuclear Services Products Department, Electronic and Computer Products Section, "Generic ERIS (Basic RTAD) Master Software-30885", Library Computer Tape-ERIS V and V Test Specimen.

14. General Electric Company, Nuclear Services Products Department, Electronic and Computer Products Section, "Generic ERIS (Basic RTAD) Master Software Source Code Listing", DRF-C95-00102-M.

15. General Electric, Nuclear Services Products Department, Electronic and Computer Products Section, "ERIS Software Problem Report".

16. General Electric, Nuclear Services Products Department, Electronic and Computer Products Support Subsection, "Generic ERIS (Basic RTAD) Functionality and Performance Summary Status", DRF-C95-00102-Q.

17. General Electric Company, Nuclear Energy Business Operation, "ERIS Validation Test Design Record File", DRF-C95-00102.

18. General Electric Company, Nuclear Energy Business Operation, "Generic ERIS (Basic RTAD) Static/Dynamic Test Review", DRF-C95-00102-N.

19. General Electric, "Emergency Response Information System Design Specification" 23A1457 Rev. 1.

20. General Electric, "Emergency Response Information System Application Design Specification" 23A1434 Rev. No. 1.

21. General Electric, "Emergency Response Information System Application Data Specification" 23A1435 Rev. No. 2.

22. General Electric, Nuclear Energy Business Operation, "ERIS V&V Test Simulator" DRF-C95-00102-0.

23. General Electric, Nuclear Energy Business Operation, "Availability Analysis of ERIS Hardware" DRF-C95-00048.

24. General Electric, Nuclear Energy Business Operation, Letter to U.S. Nuclear Regulatory Commission from H.C. Pfefferlen, Subject "Open Items from Draft SER on Gessar II SPDS" December 20, 1984 (Ref. MFN-173-84, DRF-C95-00039).

APPENDIX A

ERIS SOFTWARE VALIDATION MATRIX

ERIS SOFTWARE VALIDATION MATRIX

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
1	DUMPING, LISTING LOGGING AND PLOTTING FUNCTION	A. 4.1.1.1, 4.2.1.1.1, 4.3.1.2 AND 4.4.1.1 B. VERIFY THAT THE VAX/VMS IS OPERATIONAL AND CAN DUMP, LOG, PLOT AND LIST A FILE.	STATIC TEST	COMMAND THE COMPUTER SYSTEM TO PROVIDE DUMP, LOG, PLOT AND LIST OUTPUTS.	THE HARDCOPY OUTPUT DIRECTLY CORRESPONDS TO THE KNOWN FILES.	
2	ANALOG TO DIGITAL CONVERSION AND RANGE CHECK	A. 4.1.1.2 AND 4.1.1.3 B. VALIDATE ANALOG TO DIGITAL CONVERSION ACCURACY.	STATIC TEST	APPLY KNOWN AND CALIBRATED INPUTS PER STATIC TEST PROCEDURE PARA. 6.3.8.1.2 AND 6.3.8.1.5	VERIFY THAT THE OUTPUT VALUES ARE WITHIN +/- 1% OF THE CORRESPONDING EXPECTED VALUES DEFINED IN STATIC TEST PROCEDURE PARA. 6.3.8.1 AND 6.3.8.1.5.	
3	DAS ERROR DETECTION AND REPORTING	A. 4.1.1.2 AND 4.2.1.1.3 B. VALIDATE THAT THE SYSTEM CAN DETECT AND REPORT DAS ERRORS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARA. 6.3.10 AND 6.5.	REFER TO STATIC TEST PROCEDURE PARA. 6.3.10 AND 6.5.	
4	DAS TIME TAGGING CAPABILITY AND RESOLUTION OF DAS CLOCK	A. 4.1.1.2 AND 4.1.1.4 B. VALIDATE DAS SYSTEM CAPABILITY TO TIME TAG THE DATA.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.7. USE A KNOWN RAMP WITH KNOWN START TIME AND KNOWN SLOPE AS AN INPUT.	VERIFY THAT OUTPUT VALUES ARE WITHIN +/- 1% OF THE EXPECTED VALUES AT CORRESPONDING TIMES. THESE EXPECTED VALUES ARE DERIVED USING ALTERNATE CALCULATIONS. REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.7.	
5	VALIDATION OF DIGITAL INPUT STATE, CHANGE OF STATE DETERMINATION, TIME TAGGING OF INPUT DATA, SCAN RATE CAPABILITY OF 1, 2, 10, 25, 50, 100 AND 250 FOR ANALOG AND DIGITAL INPUTS, 500 SAMPLES PER SECOND FOR DIGITAL INPUTS; AND 5 MILLI-SECOND EVENT RESOLUTION	A. 4.1.1.3, 4.1.1.5, 4.1.1.6, 4.1.1.21, 4.2.1.1.2 AND 4.2.1.1.8 B. VALIDATE THE SYSTEMS CAPABILITY TO DETERMINE A DIGITAL INPUTS STATE, CHANGE OF STATE OF DIGITAL INPUT, SCAN RATE CAPABILITY OF ANALOG AND DIGITAL INPUTS, AND 5 MILLI-SECOND EVENT RESOLUTION CAPABILITY OF THE SEQUENCE OF EVENTS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.7 AND STATIC TEST PROCEDURE PARAGRAPH NO. 7.8.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.7 AND STATIC TEST PROCEDURE PARAGRAPH NO. 7.8.	

1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
		3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
CALENDAR TIME ASSOCIATED WITH OLDEST DATA ON THE DISK	A. 4.1.1.11 B. VALIDATE OPERATOR'S CAPABILITY TO OBTAIN A HARD COPY WHICH INCLUDES THE CALENDAR TIME ASSOCIATED WITH OLDEST TRANSIENT DATA ON THE DISK.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.3.8.3.	VERIFY THE CALENDAR TIME ASSOCIATED WITH OLDEST DATA (RECORDED IN DELTA RECORDING MODE) CORRESPONDS TO KNOWN VALUE OF OLDEST DATA.	cnl
DATA ARCHIVING AND RETRIEVAL	A. 4.1.1.12 B. VALIDATE THAT THE NORMAL STARTUP DATA CAN BE STORED ON AND RETRIEVED FROM THE TRA PROCESSOR MAG TAPE DRIVE.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.4.1.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.4.1.	cnl
SENSOR FAILURE REPORTING (FOR DAS FAILURE, REFER TO ITEM 3)	A. 4.1.1.13 B. VALIDATE SYSTEM'S CAPABILITY TO REPORT SENSOR AND DATA ACQUISITION EQUIPMENT FAILURES.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.1.2.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.1.2.	cnl
CALIBRATION CORRECTION	A. 4.1.1.14 B. VALIDATE THAT THE CALIBRATION COEFFICIENTS OBTAINED BY PERIODIC SENSOR CALIBRATION CAN BE CORRECTLY DETERMINED FOR THE FOLLOWING SENSOR TYPES: a) LINEAR b) QUADRATIC c) CUBIC d) SQUARE ROOT e) LOGARITHMIC (BASE E) f) LOGARITHMIC (BASE 10) g) ANTILOG (BASE E) h) ANTILOG (BASE 10) i) RMS j) DOUBLE INTEGRATION	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.5.	VERIFY THAT THE DIFFERENCE BETWEEN THE ANALOG VALUE REPORTED BY THE TEST RESULT, AND THE CORRESPONDING SIMULATED INPUT VALUES ARE LESS THAN OR EQUAL TO 1% OF THE SIMULATED VALUE.	cnl

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
10	APPLICATION OF FIRST ORDER LOW PASS/OR SECOND ORDER BANDPASS FILTERING TO ANALOG INPUTS	A. 4.1.1.15 B. VALIDATE THE CAPABILITY TO SELECT EITHER FIRST ORDER LOW PASS OR SECOND ORDER BANDPASS DIGITAL FILTERING. VALIDATE DIGITAL FILTERING CONSTANTS FOR ANALOG INPUTS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.2.7.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.2.7.	
11	ENGINEERING UNITS CONVERSION	A. 4.1.1.16 B. VALIDATE THAT THE ENGINEERING UNIT CONVERSIONS (ITEM 24) CAN BE PERFORMED BY THE SYSTEM.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.5. VARIABLES (USING KNOWN INPUTS) IN THE ENGINEERING UNITS.	VERIFY THAT THE VALUES ARE WITHIN +/- 1% OF THE CORRESPONDING INPUT VALUES.	
12	CALCULATE COMPOSED VALUE USING REAL TIME PROCESS DATA	A. 4.1.1.17 B. VALIDATE THAT A COMPOSED POINT CAN BE CALCULATED USING A FUNCTION WHICH USES A MAXIMUM OF 16 OF THE FOLLOWING OPERATIONS: a) DIFFERENCE b) SUM c) PRODUCT d) QUOTIENT e) SQUARE ROOT f) DIVIDE BY A CONSTANT g) MULTIPLY BY A CONSTANT h) ADD A CONSTANT i) SUBTRACT A CONSTANT	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.1.1.	DIGITAL VALUE OF THE CORE FLOW IS WITHIN +/- 1% OF THAT SHOWN IN THE CORRESPONDING FIGURES OF THE STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.1.1.	
13	USE OF HISTORICAL DATA TO GENERATE COMPOSED PARAMETERS	A. 4.1.1.17 B. VALIDATE THE CAPABILITY TO RETRIEVE PROCESS SIGNAL DATA NECESSARY TO REGENERATE COMPOSED POINT PARAMETERS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO'S. 7.3.5, 7.8.1, 7.4, 10.3.	VERIFY THAT THE VALUE OF COMPOSED POINT CA100 IS WITHIN +/- 1% OF THE ALTERNATIVELY CALCULATED VALUE.	
14	CALCULATED VARIABLE CALCULATION	A. 4.1.1.18 B. VALIDATE THAT A CALCULATED VARIABLE CAN BE FORMED FROM COMBINING ANALOG, COMPOSED AND OTHER CALCULATED VALUES.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.3.8.1.4.	VERIFY THAT THE CALCULATED VALUE PRESENTED AS TEST RESULT IS WITHIN +/- 1% OF THE ALTERNATIVELY CALCULATED VALUE.	

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
15	COMPOSED CONTACT CALCULATION	A. 4.1.1.19 B. VALIDATE THE CAPABILITY TO GENERATE COMPOSED CONTACT CALCULATIONS OF VALUES BASED UPON UP TO 16 OPERATIONS WHICH INCLUDES AT LEAST ONE OF ALL THE OPERATIONS OF THE THE FOLLOWING TYPE: a) OR b) AND c) NOT OR d) NOT AND e) GREATER THAN f) LESS THAN g) EQUAL TO	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.3.8.1.3.	VERIFY THAT THE COMPOSED CONTACT STATE IS SAME AS THE ALTERNATIVELY DERIVED STATE.	cvd.
16	COMPOSED CONTACT CHANGE OF STATE DETERMINATION	A. 4.1.1.21 B. VALIDATE THE CAPABILITY TO DETERMINE THE CHANGE OF STATE FOR COMPOSED CONTACT.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.	cvd
17	DELETE POINT FROM SCAN	A. 4.1.1.22 B. VALIDATE THAT A POINT CAN BE DELETED FROM SCAN.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.2.9	VERIFY THAT A POINT HAS BEEN DELETED FROM SCAN.	cvd
18	RESTORE TO SCAN	A. 4.1.1.22 B. VALIDATE THAT A POINT CAN BE RESTORED TO SCAN.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.2.9.	VERIFY THAT A POINT HAS BEEN RESTORED TO SCAN.	cvd
19	POINT CALIBRATION	A. 4.1.1.22 B. VALIDATE THAT A POINT CAN BE CALIBRATED.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.5.	VERIFY THAT THE POINT DEFINITION DATA BASE HAS BEEN UPDATED WITH NEW CONVERSION CONSTANTS.	cvd
20	DATA COMPRESSION LIMITS	A. 4.1.1.22 B. VALIDATE THAT DATA COMPRESSION LIMITS CAN BE ENTERED.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 6.2.3.8.1.	VERIFY THAT THE POINT DEFINITION DEFINITION DATA BASE HAS BEEN UPDATED TO INCLUDE ENTERED SIGNIFICANT CHANGE LIMITS.	cvd

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			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
21	PRINTING OF VALUE/ STATUS OF A POINT	A. 4.1.1.22 B. VALIDATE THAT THE VALUE/ STATUS OF A POINT CAN BE PRINTED.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.2.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.3.2.	Cnl
22	ENTERING OF FILTER CONSTANTS	A. 4.1.1.22 B. VALIDATE THAT THE FILTER CONSTANTS/FREQUENCIES (FOR LOW AND BANDPASS FILTERS) CAN BE ENTERED IN THE POINT DEFINITION DATA BASE AND THEY ARE APPLIED TO POINTS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH 7.4.2.	VERIFY THAT THE OUTPUT (USING THE APPLICABLE DIGITAL FILTERS) ARE WITHIN +/- 1% OF THE ALTERNATIVELY CALCULATED VALUE.	Cnl
23	2D PLOT OF HISTORICAL DATA	A. 4.1.1.28 B. VALIDATE THAT TWO DIMENSIONAL PLOTS OF PROCESS HISTORICAL DATA CAN BE GENERATED. THE PLOTS CONTAIN POINT IDENTIFICATION AND THE TIME INTERVAL.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.6.2.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.6.2.	Cnl
24	2D PLOT FOR COMPOSED/ CALCULATED/TRANSFORMED VARIABLES	A. 4.1.1.28 B. VALIDATE THAT TWO DIMENSIONAL PLOTS OF COMPOSED/ CALCULATED/TRANSFORMED HISTORICAL DATA CAN BE GENERATED. THE PLOTS CONTAIN POINT IDENTIFICATION AND THE TIME INTERVAL.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.6.2.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.6.2.	Cnl
25	DATA RECORDING FILE EDIT	A. 4.1.1.29 B. VALIDATE THAT DATA RECORDING FILES CAN BE CREATED AND EDITED BY AN OPERATOR.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO'S. 6.2.9.3, 6.3.4 AND 6.3.6.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO'S. 6.2.9.3, 6.3.4 AND 6.3.6.	Cnl
26	OFFLINE CALIBRATION FILES	A. 4.1.1.29 B. VALIDATE THAT OFF-LINE CALIBRATION FILES CAN BE CREATED AND EDITED BY AN OPERATOR.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.5.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 7.5.	Cnl

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			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
27	OPERABILITY OF IDT'S	A. 4.2.1.1.1, 4.3.1.2 B. VALIDATE THAT THE OPERATING SYSTEM FUNCTIONS SUPPORTING THE VIDEO DISPLAY ARE OPERATIONAL.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	Cal
28	OPERABILITY OF VIDEO COPIER (VERSATEC)	A. 4.2.1.1.1 B. VALIDATE THAT THE OPERATING SYSTEM FUNCTIONS SUPPORTING HARDCOPY DEVICES ARE OPERATIONAL.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	Cal
29	RANGE CHECK AND PARAMETER VALIDATION STATUS REPORTING	A. 4.2.1.1.3, 4.2.1.1.4 B. VALIDATE THAT THE RANGE CHECK INDICES GENERATE APPROPRIATE ERROR MESSAGES FOR OUT-OF-SENSOR-RANGE PROCESS INPUTS. VALIDATE THAT THE RTAD SUB-SYSTEM SHOWS THE VALIDATION STATE.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.4.1.1.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.4.1.1.	Cal
30	USE OF PARAMETER VALIDATION STATUS FOR DISPLAY GENERATION	A. 4.2.1.1.4 B. VALIDATE THAT THE PARAMETER STATUS IS USED CORRECTLY FOR DISPLAY GENERATION.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.2 AND 10.4.3.4.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.2 AND 10.4.3.4.	Cal
31	APPLICATION OF INPUT POINT COMPENSATION TO DISPLAYED VARIABLES	A. 4.2.1.1.5 B. FOR DISPLAYED VARIABLES REQUIRING COMPENSATION, VALIDATE THAT ANALOG OR COMPUTED VARIABLES REPRESENTING UNCORRECTED FLOWS AND LEVELS ARE COMPENSATED AS A FUNCTION OF FLUID TEMPERATURE AND PRESSURE.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.2.1.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.1.2.1.	Cal

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			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
32	CALCULATION OF DERIVED PARAMETERS	A. 4.2.1.1.6 B. VALIDATE THAT FOR PROCESS VARIABLES NOT DIRECTLY MEASURED, e.g., BULK POOL AND RPV TEMPERATURES AND RV LEVEL, THE RTAD SUBSYSTEM CAN CORRECTLY DERIVE THESE VARIABLES FROM OTHER MEASURED VARIABLES.	STATIC TEST	USING SIMULATED INPUTS AND/OR DATA BASE PROVIDE ALL NECESSARY INPUTS TO CALCULATE POOL TEMP. AND RPV TEMP.	USING APPROPRIATE RPV/CONTAINMENT DISPLAYS VERIFY THAT THE DISPLAYED OUTPUT IS WITHIN +/- 1% OF THE ALTERNATIVELY CALCULATED VALUES.	ok
33	LIMIT CHECKING OF VARIABLES	A. 4.2.1.1.7 B. VALIDATE THAT THE SYSTEM CAN CHECK ANY ANALOG INPUT AGAINST MULTIPLE LIMITS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.6.1.1.3.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.6.1.1.3.	ok
34	DETERMINATION OF THE VALIDATION STATUS OF CRITICAL PLANT VARIABLES	A. 4.2.1.1.9 B. VALIDATE THAT THE RTAD SUBSYSTEM IS ABLE TO CORRECTLY DETERMINE THE VALIDATION STATUS (NOT MEASURED, NOT VALIDATED, VALIDATED) OF THE MEASURED/DERIVED VALUE OF THE CRITICAL PLANT VARIABLES (CONTROL PARAMETERS). ALSO VALIDATE THAT THE STATUS IS USED CORRECTLY FOR DISPLAY GENERATION.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO'S. 10.4.3.1.1 AND 10.4.3.1.2.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO'S. 10.4.3.1.1 AND 10.4.3.1.2.	ok
35	RPV/CONTAINMENT ALARM INDICATION CHECK	A. 4.2.1.1.10 B. VALIDATE THAT THE "RPV ALARM" AND/OR "CONTAINMENT ALARM" INDICATIONS AS THEY APPEAR ON EACH DISPLAY, REFLECT THE PROPER STATUS (INACTIVE, CAUTION, OR ALARM) AS GOVERNED BY THE RPV AND CONTAINMENT CONTROL DISPLAY LIMIT TAGS AND EVENT INDICATIONS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.3.	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.3.	ok

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			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
36	VALIDATE RTAD DATA STORAGE	A. 4.2.1.1.16 B. VALIDATE THAT THE RTAD SUBSYSTEM CAN STORE 30 MINUTES WORTH OF DATA FOR ALL CONTROL PARAMETERS AND THEIR COMPONENTS. ALSO VALIDATE THAT THIS DATA IS RETRIEVABLE FOR DISPLAY GENERATION.	STATIC TEST	CREATE A SCENARIO THAT ALLOWS 30 MINUTES STORAGE OF DATA FOR ALL CONTROL PARAMETERS AND THEIR COMPONENTS, AND UPDATES THE DISPLAY FOR 30 MINUTES BASED ON THE SCENARIO INPUTS.	VERIFY THAT THE SCREEN DISPLAYS ARE DYNAMICALLY UPDATED FOR THE FULL 30 MINUTES.	
37	PROVISION FOR OPERATOR TO CALL DISPLAYS/MENU	A. 4.2.1.1.17 B. VALIDATE THAT FUNCTION KEYS ALONE OR FUNCTION KEYS AND ALPHANUMERIC KEYS (COLLECTIVELY KNOWN AS OPERATORS KEYBOARD) ARE PROVIDED AND CAN CALL UP ANY DISPLAY OR MENU.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	ACTIVATION PROVIDES REQUESTED DISPLAYS/MENU.	
38	PROVISION FOR OPERATOR TO CALL FOR HARDCOPY OF SCREEN DISPLAY.	A. 4.2.1.1.17 B. VALIDATE THAT THE OPERATOR CAN REQUEST A HARDCOPY OUTPUT OF A FORMAT USING THE KEYBOARD.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.4.3.	A HARDCOPY OF THE DISPLAY FORMAT IS PROVIDED.	
39	PROVISION FOR OPERATOR TO CALL FOR VERTICAL SCALE SCREEN DISPLAY	A. 4.2.1.1.17 B. VALIDATE THAT THE OPERATOR CAN REQUEST VERTICAL SCALE CHANGE OF SELECTED CONTROL PARAMETER ON EPC DISPLAYS OR TREND PLOTS USING THE KEYBOARD.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3 (CHANGE VERTICAL SCALES USING PAGE FORWARD/PAGE BACKWARD KEYS).	ACTIVATION PROVIDES REQUESTED VERTICAL SCALE CHANGE	
40	PROVISION FOR PAGING FORWARD OR BACKWARD THROUGH MENU FORMATS	A. 4.2.1.1.17, 4.2.1.2.1 B. VALIDATE THAT THE OPERATOR CAN PAGE FORWARD AND BACKWARD THROUGH MENU FORMATS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARAGRAPH NO. 10.3.	ACTIVATION CHANGES DISPLAY PAGES IN REQUESTED FASHION.	

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41	KEYBOARD REQUESTS AND RESPONSES ARE DISPLAYED WITH INSTRUCTION FOR OPERATOR	A. 4.2.1.1.17 B. VALIDATE THAT KEYBOARD REQUESTS AND RESPONSES ARE DISPLAYED ON THE CRT WITH INSTRUCTIONS FOR OPERATOR CHOICES AND INFORMATION REQUIRED.	STATIC TEST	STATIC PROCEDURE PARAGRAPH NO. 10.3, STEP 2B.	STATIC PROCEDURE PARAGRAPH NO. 10.3, STEP 2B.	✓
42	PROVISION FOR PREVENTION OF INADVERTENT EXECUTION OF PROGRAMS WHICH MAY ALTER STORED DATA.	A. 4.2.1.1.17 B. VALIDATE THAT CAPABILITY EXISTS TO PREVENT INADVERTENT OF PROGRAMS SO STORED DATA MAY NOT BE ALTERED.	STATIC TEST	STATIC PROCEDURE PARAGRAPH NO. 10.3, STEPS 4A-4E, 2, 3, 4, 8, AND 9.	STATIC PROCEDURE PARAGRAPH NO. 10.3, STEP 2C-2G, 4A-4E, 8A, 8B, AND 9A-9C.	✓
43	PROVISION FOR DISABLING AND ENABLING OF KEYBOARD SELECTABLE FUNCTIONS	A. 4.2.1.1.17 B. VALIDATE THAT ANY SET OF KEYBOARD SELECTABLE FUNCTIONS CAN BE DISABLED ON ONE OR MORE SYSTEM KEYBOARDS.	STATIC TEST	STATIC PROCEDURE PARAGRAPH NO. 10.3 STEP 5A THROUGH 5E.	SEE STEP 5A THROUGH 5E.	✓
44	PROVISION FOR REASSIGNING OF FUNCTION SWITCHES UNDER SOFTWARE CONTROL.	A. 4.2.1.1.17 B. VALIDATE THAT FUNCTION SWITCHES ARE REASSIGNABLE UNDER SOFTWARE CONTROL.	STATIC TEST	ASSIGN FUNCTION KEY TO A SELECTED FORMAT AND SEE IF ACTIVATION OF KEY BRINGS UP THIS FORMAT. STEP 6B.	ACTIVATION OF FUNCTION KEY BRINGS UP RIGHT FORMAT.	✓
45	TABULAR FORMAT OF MENU DISPLAYS	A. 4.2.1.2.1 B. VALIDATE THAT THE SYSTEM MENU DISPLAY IS PRESENTED IN TABULAR FORMAT.	STATIC TEST	USING GDC CALL THE SYSTEM MENU AND ANALYZE THAT THE SYSTEM MENU IS DISPLAYED IN TABULAR FORMAT.	IT IS CONCLUDED BY OBSERVATION THAT THE SYSTEM MENU DISPLAYS ARE PRESENTED IN TABULAR FORMAT.	✓
46	HORIZONTAL SCALE FOR RPV CONTROL PARAMETER (EXCEPT RPV TEMP.) TREND PLOT IS THE MOST RECENT PAST 10 MINUTES. THE SCALE FOR RPV TEMP IS 30 MINUTES.	A. 4.2.1.2.2A B. VALIDATE THAT THE HORIZONTAL SCALE FOR EACH CONTROL PARAMETER REPRESENTS THE MOST RECENT TEN MINUTES EXCEPT FOR THE RPV TEMPERATURE IN WHICH CASE THE MOST RECENT 30 MINUTES SHOULD BE REPRESENTED.	STATIC TEST	USING GDC CONTROLS, CALL RPV CONTROL DISPLAY(S). APPLY KNOWN SIMULATED INPUTS FOR CONTROL PARAMETERS FOR 30 MINUTES. (PARA. NO. 10.4.3.1.2).	LAST 10 MINUTES WORTH OF TREND IS PRESENTED FOR ALL CONTROL PARAMETERS. LAST 30 MINUTES OF TREND IS PRESENTED FOR THE RPV TEMPERATURE.	✓

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47	OPERATOR SELECTABLE AND DEFAULT VERTICAL SCALES FOR RPV CONTROL PARAMETERS	A. 4.2.1.2.2B B. VALIDATE THAT THE OPERATOR SELECTABLE AND DEFAULT VERTICAL PLOT SCALES FOR THE CONTROL PARAMETERS ARE AS SHOWN ON C95-4020 DOCUMENT.	STATIC TEST	CALL ALL EPC RPV CONTROL DISPLAYS ON IDT CONSOLE AND REVIEW SELECTABLE AND DEFAULT VERTICAL SCALES FOR ALL "RPV CONTROL" CONTROL PARAMETERS.	THE OPERATOR SELECTABLE AND DEFAULT VERTICAL SCALES FOR ALL RPV CONTROL PARAMETERS ON ALL RPV EPC DISPLAYS ARE THE SAME AS THOSE SHOWN IN THE SYSTEM DESIGN SPECIFICATION C95-4020.	ok
48	CORRECT PRESENTATION OF THE LIMIT TAGS AND CORRECT CONNECTION OF THE LIMIT TAG TAILS TO THE BAR GRAPHS FOR THE RPV CONTROL PARAMETERS LINES.	A. 4.2.1.2.2D B. VALIDATE THAT THE DYNAMIC AND/OR STATIC PROCESS LIMITS FOR EACH CONTROL PARAMETERS (RPV WATER LEVEL, RPV PRESSURE, REACTOR POWER, RPV TEMPERATURE) ARE AS SPECIFIED IN C95-4020. VALIDATE THAT THE LIMIT TAG "TAILS" CONNECT TO THE BAR GRAPH AT THE CORRECT POINT WHICH CORRESPONDS TO THE PROCESS LIMIT SHOWN IN THE C95-4020.	STATIC TEST	CALL ALL RPV EPC DISPLAYS AND VERIFY THAT THE BACKGROUND INFO CORRESPONDS TO THAT IN THE DESIGN SPECIFICATION. USING SIMULATED INPUTS OR DATABASE, VERIFY THAT THE COLOR CODES ARE CONSISTENT WITH THE VALUE OF THE VARIABLE.	THE LIMIT TAG NAMES ARE THE SAME AS THOSE SHOWN IN THE DESIGN SPECIFICATIONS. THE LIMIT TAG TAILS CONNECT TO THE BAR GRAPH AT THE POSITION SPECIFIED IN THE DESIGN SPECIFICATION, AND COLOR CODE OF THE LIMIT TAG IS CONSISTENT WITH THE VALUE OF THE PARAMETERS.	ok
49	ACCURACY OF RPV CONTROL PARAMETER TREND, TREND LINE COLOR CODING, PLACEMENT OF TREND LINE FOR UNDER/OVER SCALE AND DISPLAY OF AVERAGE VALUE IN CASE OF MULTIPLE SAMPLES DURING THE DISPLAY RESOLUTION INTERVAL.	A. 4.2.1.2.2F B. VALIDATE THAT THE TREND LINES TRACK THE RPV CONTROL PARAMETERS. VALIDATE THAT LINE COLOR CODING IS CONSISTENT WITH THE PARAMETER STATUS IN BAR GRAPH. VALIDATE THAT TREND LINES APPEAR AT TOP OR BOTTOM OF THE PLOT WHEN CONTROL PARAMETER EXCEEDS THE VERTICAL SCALE IN CORRESPONDING DIRECTION. VALIDATE THE WEIGHTED AVERAGE VALUE IS DISPLAYED WHEN MORE THAN ONE SAMPLE IS TAKEN BY DAS IN THE DISPLAY RESOLUTION TIME INTERVAL.	STATIC TEST	USING SIMULATED INPUTS AND/OR DATABASE, VARY THE VALUE OF THE RPV CONTROL PARAMETERS OVER A RANGE OF -10% TO +110%. AT LEAST 4 SETS OF INPUT VALUES SHOULD BE SIMULATED IN THE DISPLAY RESOLUTION INTERVAL.	THE VALUE PRESENTED BY TREND LINES IS WITHIN +/- 1% OF THE CORRESPONDING KNOWN INPUT VALUE. THE COLOR OF TREND LINE CORRESPONDS TO THE VALUE OF THE PARAMETER DISPLAYED (ON BAR GRAPH) AT ANY TIME INSTANT. THE TREND LINE IS DISPLAYED IN THE BOTTOM OF THE TREND PLOT WHEN THE PARAMETER VALUES ARE BETWEEN 0 AND -10% OF THE SELECTED SCALE. THE TREND LINE IS DISPLAYED IN THE TOP OF THE TREND PLOT WHEN THE PARAMETER VALUES ARE BETWEEN 100% AND 110% OF THE SELECTED SCALE. THE VALUE PRESENTED BY THE TREND PLOT AT ANY GIVEN INSTANT, IS THE WEIGHTED AVERAGE OF ALL THE CORRESPONDING SIMULATED INPUT VALUES WHICH OCCUR BETWEEN THE TIME WHEN LAST TREND PLOT WAS PLACED ON THE	ok

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49 (cont)					SCREEN AND THE TIME ASSOCIATED WITH PLACEMENT OF THE MOST RECENT VALUE OF PLACEMENT ON THE TREND DISPLAY.	
50	TRACKING OF VARIABLE LIMIT VALUES USING LIMIT LINES	A. 4.2.1.2.2G B. VALIDATE THAT FOR THE RPV CONTROL DISPLAYS THE LIMIT LINES TRACK THEIR ASSOCIATED PROCESS LIMIT VALUES WITHIN THE VERTICAL SCALE. VALIDATE THAT THE COLOR CODING IS CONSISTENT WITH THE CORRESPONDING LIMIT TAG.	STATIC TEST	USING KNOWN SIMULATED INPUTS AND/OR DATABASE VARY THE VALUES AND VERIFY THE REQUIRED TRACKING AND COLOR CODING.	THE DISPLAYED VARIABLE LIMIT (PRESENTED BY ASSOCIATED LIMIT LINE) IS WITHIN +/- 1% OF THE ALTERNATIVELY CALCULATED VALUE OF THE VARIABLE LIMIT AT ANY GIVEN INSTANT IN TIME, AND THE COLOR CODE OF THE LIMIT TAG IS CONSISTENT WITH THE VALUE OF THE PARAMETER.	a1
51	HORIZONTAL SCALE FOR ALL CONTAINMENT CONTROL PARAMETERS IN TREND PLOTS IS MOST RECENT PAST 10 MINUTES.	A. 4.2.1.2.2A B. VALIDATE THAT THE HORIZONTAL SCALE FOR EACH PARAMETER REPRESENTS THE MOST RECENT TEN MINUTES.	STATIC TEST	USING GDC CONTROLS CALL EACH CONTAINMENT CONTROL DISPLAY, APPLY KNOWN SIMULATED INPUTS FOR CONTROL PARAMETERS FOR 10 MINUTES.	LAST 10 MINUTES OF TREND IS PRESENTED FOR ALL CONTAINMENT CONTROL PARAMETERS.	a1
52	OPERATOR SELECTABLE AND DEFAULT VERTICAL SCALES FOR CONTAINMENT CONTROL PARAMETERS	A. 4.2.1.2.2B B. VALIDATE THAT THE OPERATOR SELECTABLE AND DEFAULT VERTICAL PLOT SCALES FOR THE CONTROL PARAMETERS ARE AS SHOWN IN C95-4020 DOCUMENT.	STATIC TEST	CALL ALL EPG CONTAINMENT CONTROL DISPLAYS ON IDT CONSOLES AND REVIEW SELECTABLE AND DEFAULT VERTICAL SCALES FOR ALL "CONTAINMENT CONTROL" CONTROL PARAMETERS.	THE OPERATOR SELECTABLE AND DEFAULT VERTICAL SCALES ARE THE SAME AS THOSE SHOWN IN THE SYSTEM DESIGN SPECIFICATIONS C95-4020.	a1
53	CORRECT PRESENTATION OF THE LIMIT TAGS AND CORRECT CONNECTION OF THE LIMIT TAG TAILS TO THE BAR GRAPHS FOR THE CONTAINMENT CONTROL PARAMETERS	A. 4.2.1.2.2D B. VALIDATE THAT THE DYNAMIC AND/OR STATIC PROCESS LIMITS FOR EACH CONTROL PARAMETER FOR CONTAINMENT CONTROL) ARE AS SPECIFIED IN C95-4020. VALIDATE THAT THE LIMIT TAG "TAILS" CONNECT TO THE BAR GRAPH AT THE CORRECT POINT WHICH CORRESPONDS TO THE PROCESS LIMIT AND ARE SHOWN IN C95-4020.	STATIC TEST	CALL ALL CONTAINMENT CONTROLS EPG DISPLAYS AND VERIFY THAT THE BACKGROUND INFO CORRESPONDS TO THAT IN THE DESIGN SPECIFICATION. USING SIMULATED INPUTS AND OR DATABASE VERIFY THAT THE COLOR CODES ARE CONSISTENT WITH THE VALUE OF THE VARIABLE.	THE LIMIT TAG NAMES ARE THE SAME AS THOSE SHOWN IN THE DESIGN SPECIFICATIONS. THE LIMIT TAG TAILS CONNECT TO THE BAR GRAPH AT THE POSITION SPECIFIED IN THE DESIGN SPECIFICATION, AND COLOR CODE OF THE LIMIT TAG IS CONSISTENT WITH THE VALUE OF THE PARAMETER.	a1

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
54	ACCURACY OF CONTAINMENT CONTROL PARAMETER TREND, TREND LINE COLOR CODING, PLACEMENT OF TREND LINE FOR UNDER/ OVER SCALE AND DISPLAY OF AVERAGE VALUE IN CASE OF MULTIPLE SAMPLES DURING THE DISPLAY RESOLUTION INTERVAL	A. 4.2.1.2.2F B. VALIDATE THAT THE TREND LINES TRACK THE CONTAINMENT CONTROL PARAMETERS. VALIDATE THAT THE LINE COLOR CODING IS CONSISTENT WITH THE PARAMETER STATUS IN BAR GRAPH. VALIDATE THAT TREND LINES APPEAR AT THE TOP OR BOTTOM OF THE PLOT WHEN CONPARAMETER EXCEEDS THE VERTICAL SCALE IN THE CORRESPONDING DIRECTION. VALIDATE THE WEIGHTED AVERAGE VALUE IS DISPLAYED WHEN MORE THAN ONE SAMPLE IS TAKEN BY DAS IN THE DISPLAY RESOLUTION TIME INTERVAL.	STATIC TEST	USING SIMULATED INPUTS AND/OR DATABASE, VARY THE VALUE OF THE CONTAINMENT CONTROL PARAMETER OVER A RANGE OF -10% TO +110%. AT LEAST 4 SETS OF INPUT VALUES SHOULD BE SIMULATED IN THE DISPLAY RESOLUTION INTERVAL.	THE VALUE PRESENTED BY TREND LINES IS WITHIN +/-1% OF THE CORRESPONDING KNOWN INPUT VALUE. THE COLOR OF THE TREND LINE CORRESPONDS TO THE VALUE OF THE PARAMETER DISPLAYED (ON BAR GRAPH) AT ANY TIME INSTANT. THE TREND LINE IS DISPLAYED IN THE BOTTOM OF THE TREND PLOT WHEN THE PARAMETER VALUES ARE BETWEEN 0 AND -10% OF THE SELECTED SCALE. THE TREND LINE IS DISPLAYED IN THE TOP OF THE TREND PLOT WHEN THE PARAMETER VALUES ARE BETWEEN 100% AND 110% OF THE SELECTED SCALE. THE VALUE PRESENTED BY THE TREND PLOT AT ANY GIVEN INSTANT, OR THE WEIGHTED AVERAGE OF ALL THE CORRESPONDING SIMULATED INPUT VALUES WHICH OCCUR BETWEEN THE TIME WHEN LAST TREND PLOT VALUE WAS PLACED ON THE SCREEN AND THE TIME ASSOCIATED WITH THE PLACEMENT OF THE MOST RECENT VALUE OF PARAMETER ON THE TREND DISPLAY.	Cal.
55	TRACKING OF VARIABLE LIMIT VALUES USING LIMIT LINES	A. 4.2.1.2.2G B. LIMIT LINES ARE APPLICABLE TO CONTROL PARAMETERS ONLY AND SHALL BE VALIDATED ACCORDING TO PARAGRAPH 4.2.1.2.2.G FOR INDIVIDUAL TREND PLOTS AS WELL AS THE PLOTS ON THE EPG DISPLAYS.	STATIC TEST	USING KNOWN SIMULATED INPUTS AND/ OR DATABASE, VARY THE VALUE OF VARIABLE PROCESS LIMIT(S) ASSOCIATED WITH THE CONTROL PARAMETERS.	THE DISPLAYED VARIABLE LIMIT (PRESENTED BY ASSOCIATED LIMIT LINE) IS WITHIN +/-1% OF THE ALTERNATELY CALCULATED VALUE OF THE VARIABLE AT ANY GIVEN INSTANT IN TIME, AND THE COLOR CODE OF THE LIMIT TAG IS CONSISTENT WITH THE VALUE OF THE PARAMETER.	Cal
56	PRESENTATION OF CONTROL PARAMETERS IN TREND PLOT FORM	A. 4.2.1.2.3 B. VALIDATE THAT ALL CONTROL PARAMETERS AND THEIR COMPONENTS CAN BE DISPLAYED ON TREND PLOTS AND THAT THE DISPLAYS CONFORM TO THE FOLLOWING: a) HORIZONTAL PLOT SCALE: VALIDATE THAT THE DATE	STATIC TEST	USING GDC CALL THE TREND PLOT MENU. USING FORMAT NUMBERS IDENTIFIED IN THE MENU CALL EACH OF THE FORMATS LISTED IN THE MENU, AND VERIFY STATEMENTS CONTAINED IN COLUMN 2 OF THIS MATRIX AGAINST C95-4020. USING KNOWN SIMULATED INPUTS AND/OR DATABASE, VARY THE VALUE OF THE PROCESS VARIABLE AND VERIFY THE PRESEN-	EACH CONTROL PARAMETERS IDENTIFIED IN THE SYSTEM DESIGN SPECIFICATION HAS A FORMAT NUMBER ASSIGNED TO IT IN THE TREND PLOT MENU. THE BACKGROUND INFORMATION ASSOCIATED WITH EACH FORMAT CORRESPONDS DIRECTLY TO THE SAME INFORMATION PRESENTED IN THE DESIGN SPECIFICATION. THE DIGITAL VALUES CORRESPOND DIRECTLY TO THE KNOWN INPUTS AND BAR GRAPHS	Cal

EM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
ont)		THAT THE HORIZONTAL SCALE FOR EACH PLOT REPRESENTS THE MOST RECENT THIRTY MINUTES. b) VERTICAL PLOT SCALE: VALIDATE THAT THE VERTICAL USED FOR EACH PLOT REPRESENTS THE INSTRUMENT RANGE OF THE PROCESS INPUT BEING PLOTTED EXCEPT FOR CONTROL PARAMETERS WHICH MAY HAVE MULTIPLE SCALES (SEE PARAGRAPH 4.2.1.2.2.B FOR VALIDATION OF CONTROL PARAMETER TREND PLOTS). c) BAR GRAPH AND DIGITAL READOUT: VALIDATE THAT THE BAR GRAPH AND DIGITAL READOUT CORRECTLY REFLECT THE SINGLE PROCESS INPUT VALUE AND STATUS (OUT OF RANGE, IN RANGE) AS APPLICABLE TO EACH INPUT. FOR VALIDATION OF CONTROL PARAMETERS SEE PARAGRAPH 4.2.1.2.2.C. d) LIMIT TAGS: LIMIT TAGS ARE APPLICABLE ONLY TO CONTROL PARAMETERS AND SHALL BE VALIDATED ACCORDING TO PARAGRAPH 4.2.1.2.2.D FOR THE INDIVIDUAL PLOTS AS WELL AS FOR THE PLOTS ON THE EPG DISPLAYS. e) TREND LINES: VALIDATE THE TREND LINES FOR PROCESS INPUTS AS WELL AS CONTROL PARAMETERS ACCORDING TO 8) PARAGRAPH 4.2.1.2.2.F. LIMIT LINES: LIMIT LINES ARE APPLICABLE TO CONTROL PARAMETERS ONLY AND SHALL BE VALIDATED ACCORDING TO PARAGRAPH 4.2.1.2.2.G FOR INDIVIDUAL TREND PLOTS AS WELL AS THE PLOTS ON THE EPG DISPLAYS.		TATION OF BAR GRAPHS AND DIGITAL VALUES PER REQUIREMENTS INCLUDED IN COLUMN 2 OF THIS MATRIX.	ARE ACCURATE TO WITHIN THE RESOLUTION OF THE IDT CRT.	

1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
		3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
SRV OPEN STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.1 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SRV OPEN COMMANDS AND POSITION INDICATIONS, VALIDATE THAT THE SRV OPEN STATUS INDICATIONS, VALIDATE THAT THE SRV OPEN STATUS INDICATIONS ON DISPLAYS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.1.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.1.	c.l.
MSIV SHUT STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.2 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF MSIV ISOLATION COMMANDS, TIME SINCE RECEIPT OF COMMAND, AND VALVE POSITIONS, VALIDATE THAT THE MSIV SHUT STATUS INDICATION CORRECTLY REFLECTS THE APPROPRIATE STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.2.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.2.	c.l.
GROUP ISOLATED STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.3 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF ISOLATION COMMANDS, TIME SINCE RECEIPT OF COMMAND, VALVE POSITIONS, FLOW PATHS, AND ISOLATION GROUPS, VALIDATE THAT THE GROUP ISOLATED STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.3.	SEE STATIC TEST PROCEDURE PARA NO. 10.4.3.2.3	c.l.

0 TEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLI-ANCE CERTIFI-CATION
			3.1 VALI-DATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
60	SCRAM STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.4 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SCRAM COMMANDS, TIME SINCE RECEIPT OF COMMAND, AND ROD POSITION INDICATION, VALI-DATE THAT THE SCRAM STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.4.	cd.
61	D.G. OPERATION STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.5 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF DG INITIATION COMMAND, TIME SINCE RECEIPT OF COMMAND, AND DG OPERATIONAL STATUS INFORMATION, VALIDATE THAT THE DIESEL GENERATOR OPERA-TION STATUS INDICATIONS CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATE AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.5.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.5.	cd.
62	SPM SYSTEM STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.6 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SPMS INITIATION COMMAND, TIME SINCE RECEIPT OF COM-MAND, AND VALVE POSITIONS, VALIDATE THAT THE SPMS STATUS INDICATION CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.6.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.2.6.	cd.

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
63	MSL RADIATION/RADIATION INDICATION EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.8 B. FOR A REPRESENTATIVE NUMBER OF MSL RADIATION AND GENERAL RADIATION MONITOR INPUT COMBINATIONS VALIDATE THAT THE STATUS OF THE RADIATION INDICATION IS CORRECT. VERIFY THAT THE STATUS WILL INDICATE ALARM WHEN BOTH ALARM AND BAD DATA STATES EXIST. WHEN BOTH CAUTION AND BAD DATA STATES EXIST, VERIFY THAT THE BAD DATA STATUS IS INDICATED. VERIFY THAT THE DEFAULT STATUS IS INACTIVE.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.6.1.2.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.6.1.2.4.	cnl
64	ADS OPEN STATUS EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.13 B. FOR A REPRESENTATIVE NUMBER OF ADS INITIATION COMMANDS AND SRV POSITIONS VERIFY THAT WHEN A COMMAND IS INITIATED, A SAFE STATUS IS INDICATED FOR EACH OPEN VALVE AND AN ALARM STATUS IS INDICATED FOR EACH CLOSED VALVE. FOR ANY VALVE WHOSE POSITION IS NOT KNOWN OR BAD DATA VERIFY THAT BAD DATA IS INDICATED. WHEN NO INITIATION COMMAND HAS BEEN RECEIVED VERIFY THAT THE INACTIVE STATUS IS REFLECTED.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.6.1.2.3.	SEE STATIC TEST PROCEDURE PARA. NO. 10.6.1.2.3.	cnl
65	SRV OPEN QUANTITY EVENT INDICATOR ON EPG DISPLAY	A. 4.2.1.2.4.14 B. FOR A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SRV OPEN AND STUCK OPEN POSITIONS, VALIDATE THAT THE TOTAL QUANTITY OF OPEN VALVES ARE INDICATED.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO.'S 10.6.1.2.1 AND 10.6.1.2.2.	SEE STATIC TEST PROCEDURE PARA. NO.'S 10.6.1.2.1 AND 10.6.1.2.2.	cnl

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
65 (cont)		VALIDATE THAT THE ALARM STATUS IS INDICATED IF AT LEAST ONE VALVE IS STUCK OPEN. VERIFY THAT BAD DATA IS INDICATED ONLY IN THE EVENT THAT NO SRVS ARE OPEN OR STUCK OPEN AND THAT AT LEAST ONE OF THE INPUT VALVE POSITIONS IS BAD DATA.				
66	WATER AVAILABLE STATUS SYSTEM STATES ON EPG DISPLAYS	A. 4.2.1.2.5.1 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF WATER SOURCE QUANTITY, WATER SOURCE LEVEL, AND MINIMUM PUMP OPERATING LEVEL, VALIDATE THAT THE WATER AVAILABLE STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	c,l
67	COOLING AVAILABLE STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.2 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS COOLING FLOW, COOLING PUMP RUNNING STATUS, VALVE LINE UP STATUS, AND COOLING WATER AND SYSTEM INLET TEMPERATURES, VALIDATE THAT THE COOLING AVAILABLE STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	c,l

	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
8	MAIN CONDENSER VACUUM STATUS SYSTEM STATES ON EPG DISPLAYS	A. 4.2.1.2.5.3 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF CONDENSER PRESSURE AND, CONDENSER TRIP SETPOINT PRESSURE, VALIDATE THAT THE MAIN CONDENSER VACUUM STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARA. NO.'S 10.4.3.4.5 AND 10.4.3.4.6.	REFER TO STATIC TEST PROCEDURE PARA. NO.'S 10.4.3.4.5 AND 10.4.3.4.6.	✓
9	LIQUID AVAILABLE STATES ON EPG DISPLAY	A. 4.2.1.2.5.4 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF LIQUID SOURCE QUANTITY, LIQUID SOURCE LEVEL, AND MINIMUM PUMP OPERATING LEVEL, VALIDATE THAT THE LIQUID AVAILABLE STATUS INDICATION CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.8.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.8.	✓
0	RPV PRESSURE STATUS SYSTEM STATES ON EPG DISPLAY.	A. 4.2.1.2.5.5 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SYSTEM PUMP PRESSURES, RPV PRESSURES, AND PUMP QUANTITIES, VALIDATE THAT THE RPV PRESSURE STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE 10.4.3.4	SEE 10.4.3.4	✓

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIRFMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLI-ANCE CERTIFI-CATION
			3.1 VALI-DATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
71	FEEDWATER/CONDENSATE SYSTEM PUMP POWER AVAILABLE STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.6 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF PUMP GROUPS, FLOW PATH, AND POWER SOURCE INFORMATION, VALIDATE THAT THE FEEDWATER/ CONDENSATE SYSTEM PUMP POWER AVAILABLE STATUS INDICATION CORRECTLY REFLECT THE APPRO-PRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR COD-ING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.1.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.1.	cd.
72	SYSTEM PUMP/FAN POWER AVAILABLE SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.7 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF PUMP GROUPS, FLOW PATH, AND POWER SOURCE INFORMATION, VALIDATE THAT THE SYSTEM PUMP/FAN POWER AVAILABLE STATUS INDICATIONS REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	cd

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
73	HYDRAULIC POWER AVAILABLE STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.8 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF HYDRAULIC PRESSURE, AND MINIMUM OPERATING HYDRAULIC PRESSURE, VALIDATE THAT THE HYDRAULIC POWER AVAILABLE STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO.'S 10.4.3.4.5 AND 10.4.3.4.6.	SEE STATIC TEST PROCEDURE PARA. NO.'S 10.4.3.4.5 AND 10.4.3.4.6.	cd
74	SYSTEM VALVE POWER AVAILABLE STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.9 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF FLOW PATHS AND VALVE POWER INFORMATION, VALIDATE THAT THE HYDRAULIC POWER AVAILABLE STATUS INDICATION CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.7.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.7.	cd
75	FEEDWATER - CONDENSATE SYSTEM PUMP RUN STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.10 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF PUMP GROUPS, FLOW PATHS, AND PUMP RUNNING INFORMATION, VALIDATE THAT THE FEEDWATER/ CONDENSATE SYSTEM PUMP RUN STATUS INDICATION CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.1	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.1.	cd

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
76	SYSTEM PUMP/FAN RUN STATUS SYSTEM STATES RUN EPG DISPLAY	A. 4.2.1.2.5.11 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF FLOW PATHS, PUMPS, AND PUMP RUNNING INFORMATION, VALIDATE THAT THE SYSTEM PUMP/FAN RUN STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	e.d
77	VALVE OPEN STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.12 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF VALVE POSITIONS AND MINIMUM VALVE POSITIONS, VALIDATE THAT THE VALVE OPEN STATUS INDICATIONS CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	e.d
78	VALVE LINE UP STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.13 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF FLOW PATHS AND VALVE POSITIONS, VALIDATE THAT THE VALVE LINE-UP STATUS INDICATIONS CORRECTLY REFLECT THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4.	e.d

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
79	CONTAINMENT PRESSURE STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.14 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF CONTAINMENT OR DRYWELL PRESSURES AND SPRAY INITIATION PRESSURE LIMITS, VALIDATE THAT THE CONTAINMENT PRESSURE STATUS INDICATION CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.4	
80	POOL LEVEL STATUS SYSTEM STATES ON EPG DISPLAY	A. 4.2.1.2.5.15 B. FOR EACH APPLICABLE SYSTEM AND A REPRESENTATIVE NUMBER OF INPUT COMBINATIONS OF SUPPRESSION POOL LEVELS AND SPRAY NOZZLE ELEVATIONS, VALIDATE THAT THE POOL LEVEL STATUS INDICATION CORRECTLY REFLECTS THE APPROPRIATE SYSTEM STATES AND THEIR ASSOCIATED COLOR CODING AND LABELS.	STATIC TEST	REFER TO STATIC TEST PROCEDURE PARA. NO. 10.4.3.1.1.6.	REFER TO STATIC TEST PROCEDURE PARA. NO. 10.4.3.1.1.6	
81	2-D PLOTS	A. 4.2.1.2.6 B. VALIDATE THE CAPABILITY TO GENERATE REAL-TIME COLOR GRAPHIC 2D PLOTS FROM PROCESS VARIABLES, COMPOSED POINTS, CALCULATED VARIABLES, AND TRANSFORMED VARIABLES. VALIDATE THAT THESE PLOTS REPRESENT THE CURRENT VALUES OF THE TWO PARAMETERS AS A DISTINCT ENTITY AND THAT THE CURVE CONTINUOUSLY TRACKS THE VALUES OF THE TWO PARAMETERS. ALSO VALIDATE	STATIC TEST	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.5	SEE STATIC TEST PROCEDURE PARA. NO. 10.4.3.5	

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
81 (cont)		THAT WHEN THE CURRENT VALUES FALL WITHIN THE FORBIDDEN (LIMIT) REGION, THE VALUES AND THEIR TRACK ARE CLEARLY DISTINGUISHED FROM THE FORBIDDEN REGION.				
82	CRITICAL PLANT VARIABLE DISPLAYS	A. 4.2.1.2.7 B. VALIDATE THAT THE CONTROL PARAMETERS, LIMITS AND EVENT INDICATIONS ON THE CRITICAL PLANT VARIABLES DISPLAY RESPOND IDENTICALLY TO THE CORRESPONDING DIGITAL READOUT, LIMIT TAG OR EVENT INDICATION ON THE RPV CONTROL OR CONTAINMENT CONTROL DISPLAY. (SEE STATIC TEST PROCEDURE PARA. NO.'S 10.4.3.2, 10.4.3.1, AND 10.6.1.1 FOR REFERENCE ONLY.	STATIC TEST	WHILE RUNNING APPLICABLE TESTS DEFINED IN ITEMS 86 THRU 100, CALL UP THE CRITICAL PLANT VARIABLE DISPLAY.	BACKGROUND INFORMATION CONTAINED IN THE CRITICAL PLANT VARIABLE DISPLAY CORRESPONDS DIRECTLY TO THAT CONTAINED IN THE DESIGN SPECIFICATION, THE VALUE OF CONTROL PARAMETERS, LIMIT TAC INDICATION AND STATUS OF EVENTS SHOWN IN THE CRITICAL PLANT VARIABLES DISPLAY CORRESPONDS DIRECTLY TO THOSE SHOWN IN THE EPG DISPLAY DURING THE TESTS IDENTIFIED IN ITEMS 86 THRU 100.	ok.
83	DYNAMIC DATA UPDATE TIME	A. 4.2.1.1.12 B. VALIDATE THAT THE DYNAMIC DATA UPDATE TIME FOR CONSOLE CRT FORMATS IS LESS THAN FOUR SECONDS WITH MAXIMUM EXPECTED PROCESSOR LOADING.	DYNAMIC TEST	WITH THE RTAD SYSTEM RUNNING, ENTER SIMULATED DATA FOR A TYPICAL BWR TRANSIENT VIA FORMATTER INPUT PORTS. MEASURE THE TIME BETWEEN THE ENTRY OF A SET OF DATA (ASSOCIATED WITH A SINGLE POINT IN TIME) AND THE DISPLAY OF THAT DATA ON THE GRAPHICS DISPLAY CONSOLE.	VERIFY THAT THE MEASURED TIME IS LESS THAN 4 SECONDS.	KJS
84	BACKGROUND DATA UPDATE TIME	A. 4.2.1.1.13 B. VALIDATE THAT CONTROL ROOM CRT BACKGROUND DATA UPDATE TIME IS LESS THAN FOUR SECONDS.	DYNAMIC TEST	WITH THE RTAD SYSTEM RUNNING AND RESPONDING TO SIMULATED DATA FOR A TYPICAL BWR TRANSIENT, MEASURE THE TIME BETWEEN THE OPERATOR REQUEST FOR A PREFORMATTED PAGE DISPLAY AND PRESENTATION OF THE SAME DISPLAY ON GRAPHIC DISPLAY CONSOLE'S CRT.	VERIFY THAT THE MEASURED TIME IS LESS THAN 4 SECONDS.	KJS

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
85	TREND PLOT DISPLAY AND VALIDATION STATUS OF CONTROL PARAMETERS IN RPV DISPLAYS	A. 4.2.1.2.2 B. VALIDATE THAT ALL CONTROL PARAMETERS FOR RPV CONTROL DISPLAYS ARE AVAILABLE IN TREND PLOT FORM ON EPG DISPLAYS, AND THEY REFLECT THE VALIDATION STATUS SHOWN IN THE CORRESPONDING PARAMETER VALIDATION DISPLAYS.	DYNAMIC TEST	REFER TO SCENARIO Z OF THE DYNAMIC TEST PROCEDURE.	REFER TO APPLICABLE EXPECTED TEST RESULTS CONTAINED IN THE DYNAMIC TEST PROCEDURE.	KJS
86	PRESENTATION OF VALUE AND THE VALIDATION STATUS OF RPV CONTROL PARAMETERS IN RPV CONTROL DISPLAYS	A. 4.2.1.2.2C B. VALIDATE THAT THE VALUE AND STATUS (NOT MEASURED, NOT VALIDATED, VALIDATED) OF THE RPV CONTROL PARAMETERS IN THE BAR GRAPHS AND DIGITAL READOUTS IS CORRECT.	DYNAMIC TEST	REFER TO Z SCENARIO OF THE DYNAMIC TEST PROCEDURE.	REFER TO THE Z SCENARIO OF THE DYNAMIC TEST PROCEDURE.	KJS
87	TREND PLOT DISPLAY AND VALIDATION STATUS OF CONTROL PARAMETERS IN CONTAINMENT CONTROL DISPLAYS	A. 4.2.1.2.2 B. VALIDATE THAT ALL CONTROL PARAMETERS FOR CONTAINMENT CONTROL DISPLAYS ARE AVAILABLE IN TREND PLOT FORM ON EPG DISPLAYS, AND THEY REFLECT THE VALIDATION STATUS SHOWN IN THE CORRESPONDING PARAMETER VALIDATION DISPLAYS.	DYNAMIC TEST	REFER TO SCENARIO Z OF THE DYNAMIC TEST PROCEDURE.	REFER TO SCENARIO Z OF THE DYNAMIC TEST PROCEDURE.	KJS
88	PRESENTATION OF VALIDATION STATUS OF CONTAINMENT CONTROL PARAMETERS IN CONTAINMENT CONTROL DISPLAYS	A. 4.2.1.2.2C B. VALIDATE THAT THE VALUE AND STATUS (NOT MEASURED, NOT VALIDATED, VALIDATED) OF THE CONTAINMENT CONTROL PARAMETERS IN THE BAR GRAPHS AND DIGITAL READOUTS ARE CORRECTLY PRESENTED.	DYNAMIC TEST	REFER TO DYNAMIC TEST PROCEDURE SCENARIO.	REFER TO SCENARIO Z OF DYNAMIC TEST PROCEDURE.	KJS

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
89	SYSTEM PERFORMANCE DURING POWER TRANSIENT, AND PROCESSOR LOADING.	A. NONE B. DEMONSTRATE ACCEPTABILITY OF SUSTAINED SYSTEM PERFORMANCE WHEN SUBJECTED TO THE DYNAMICS OF THE PLANT, AS REPRESENTED BY A SET OF TYPICAL BWR PLANT TRANSIENTS. VERIFY THAT MULTIPLE FUNCTIONS CAN BE SIMULTANEOUSLY PERFORMED. ALSO VERIFY THAT THE PROCESSOR LOADING IS IN ACCORDANCE WITH THE REQUIREMENTS, AND THE SYSTEM IS FREE FROM SYSTEM TIMING PROBLEMS, MULTIPLE FUNCTION INTERACTION PROBLEMS AND RACE CONDITIONS.	DYNAMIC TEST	ENTER SIMULATED AND/OR MEASURED DATE, PER THE CRITERIA CONTAINED IN THE DYNAMIC TEST PROCEDURE AND CAPTURE THE DATA REQUIRED BY THE PROCEDURE.	DESIGN REVIEW AND ANALYSIS INDICATES THAT ALL REQUESTED FUNCTIONS ARE PERFORMED, AND THE RESPONSE/ EXECUTION TIME AND ACCURACY OF THE OUTPUTS ARE ACCEPTABLE. THE PROCESSOR LOADING IS AT OR BELOW WHAT IS CONTAINED IN THE REQUIREMENTS.	KJS
90	RTAD SYSTEM CAPABILITY TO ACCOMMODATE 100 PREFORMATTED PAGES	A. 4.2.1.1.11 B. VALIDATE THAT THE RTAD SYSTEM CAN DISPLAY A MINIMUM OF 100 PREFORMATTED PAGE FORMATS.	INSPECTION ANALYSIS	ANALYZE THE SYSTEM SOFTWARE TO VERIFY THAT 100 PREFORMATTED PAGES CAN BE ACCOMMODATED BY THE RTAD SYSTEM.	ANALYSIS PROVES THAT STATEMENT IN COLUMN 1 OF THIS MATRIX IS CORRECT.	KJS
91	CAPABILITY OF A DISPLAY FORMAT TO ACCOMMODATE 75 DYNAMIC VARIABLES	A. 4.2.1.1.11 B. VALIDATE THAT A FORMAT PAGE CAN ACCOMMODATE A MINIMUM OF 75 DYNAMIC VARIABLES INCLUDING (DIGITAL VALUES, TREND PLOTS, 2-D PLOTS, AND BAR GRAPHS.)	INSPECTION ANALYSIS	REVIEW RELATIVELY BUSY RTAD DISPLAYS AND BY ANALYSIS VERIFY THAT 75 DYNAMIC VARIABLES WILL NOT CLUTTER A PREFORMATTED PAGE DISPLAY.	ANALYSIS PROVES THAT STATEMENT IN COLUMN 1 OF THIS MATRIX IS CORRECT.	KJS
92	DEMONSTRATION OF DYNAMIC DISPLAY TYPES	A. 4.2.1.1.11 B. VALIDATE THAT THE RTAD SYSTEM CAN DISPLAY DYNAMIC DATA TYPES AS FOLLOWS: BAR GRAPHS, TREND PLOTS, DIGITAL VALUES, 2-D PLOTS, COLOR CHANGES, SHAPE CHANGES, ALPHANUMERIC CHARACTERS, AND COLOR BLINKING.	INSPECTION ANALYSIS	REVIEW RTAD DISPLAYS AND VERIFY THAT THE DISPLAY TYPES INDICATED ABOVE ARE INCLUDED IN THE PREFORMATTED PAGE DISPLAYS.	ANALYIS PROVES THAT STATEMENT IN COLUMN 1 OF THIS MATRIX IS CORRECT.	KJS

ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
93	VERIFY THAT SYSTEM CAN DEFINE APPROPRIATE ALPHANUMERIC SYMBOLS	A. 4.2.1.1.11 B. VALIDATE THAT THE SYSTEM CAN DEFINE ALPHANUMERIC AND GRAPHIC SYMBOLS FOR THE FOLLOWING FUNCTIONS: LABELS/ IDENTIFIERS, ABBREVIATED DESCRIPTIONS, UNITS OF MEASURE, POINTS OF REFERENCE DEVICE ENCODING, AREA DELINEATORS, CONNECTORS AND LINE DIAGRAMS.	INSPECTION ANALYSIS	ANALYZE THE PREFORMATTED RTAD DISPLAYS AND VERIFY THAT ALPHANUMERIC/GRAPHIC SYMBOLS HAVE BEEN DEFINED FOR THE ABOVE FUNCTIONS.	ANALYSIS PROVES THAT STATEMENTS IN COLUMN 1 OF THIS MATRIX IS CORRECT.	KJ7
94	GENERATION OF THE COPY OF THE DISPLAY SCREEN	A. 4.2.1.1.14 B. VALIDATE THAT BLACK AND WHITE HARD COPY OF ANY ERIS DISPLAY WHICH IS CURRENTLY DISPLAYED ON AN ERIC GDC CAN BE GENERATED.	INSPECTION ANALYSIS	PRESS HARDCOPY FUNCTION ON IDT TO SEE IF REQUESTED COPY OF SCREEN IS GENERATED.	THE GENERATED COPY IS THE BLACK AND WHITE COPY OF THE DISPLAY ON THE IDT CONSOLE.	KJ5
95	VIDEO FORMAT DATA AND TIME VALIDATION	A. 4.2.1.1.15 B. VALIDATE THAT THE COLOR GUN STATUS (RED, GREEN AND BLUE) AND THE DATE AND TIME APPEAR IN THE LOWER RIGHT HAND CORNER OF EACH DISPLAY AND THAT THE TIME IS EXPRESSED TO THE NEAREST SECOND.	INSPECTION ANALYSIS	OBSERVE IF THE LOWER RIGHT HAND CORNER OF EACH DISPLAY SHOWS THE COLOR GUN STATUS (R/G/B). ALSO OBSERVE IF DATE AND TIME APPEAR IN LOWER RIGHT HAND CORNER AND TIME EXPRESSED TO NEAREST SECOND.	THE REVIEW INDICATES THAT THE STATEMENT INCLUDED IN COLUMN 2B OF THIS MATRIX IS TRUE.	KJ3
96	VERIFY THAT THE NUMBER OF IDT TERMINALS (CRTS) WHICH CAN BE DRIVEN BY THE RTAD SYSTEM WITHOUT SYSTEM PERFORMANCE DEGRADATION (BEYOND THE LIMIT SPECIFIED IN THE SYSTEM DESIGN SPECIFICATION) IS GREATER THAN OR EQUAL TO THOSE CONTAINED IN THE REQUIREMENTS	A. NONE B. REFER TO COLUMN 1 OF THIS MATRIX.	INSPECTION ANALYSIS	USING THE CPU NULL TIME DATA COLLECTED DURING THE DYNAMIC TEST, ANALYZE THE SYSTEM SOFTWARE AND PROJECT THE NUMBER OF IDT TERMINALS WHICH CAN BE DRIVEN WITHOUT VIOLATING CONSTRAINTS CONTAINED IN THE COLUMN 1 OF THIS MATRIX.	THE ANALYSIS INDICATES THAT THE NUMBER OF IDT TERMINALS (CRT'S) IS GREATER OR EQUAL TO THOSE CONTAINED IN THE SYSTEM REQUIREMENTS.	KJ3

0 ITEM	1 IDENTIFICATION OF ERIS FEATURES (FUNCTION PERFORMANCE CAPABILITY, OR PARAMETER) TO BE VALIDATED	2 A. APPLICABLE PARAGRAPH NO. OF THE "ERIS VALIDATION TEST REQUIREMENTS" SPECIFICATION REVISION 1 B. INTERPRETATION OF VALIDATION REQUIREMENTS	3 VALIDATION APPROACH			4 COMPLIANCE CERTIFICATION
			3.1 VALIDATION METHOD	3.2 SUMMARY OF VALIDATION APPROACH	3.3 SUMMARY OF ACCEPTANCE CRITERIA	
97	VERIFY THAT THE CALCULATED ERIS SYSTEM AVAILABILITY IS IN ACCORDANCE WITH THE REQUIREMENTS	A. NONE B. REFER TO COLUMN 1 OF THIS MATRIX.	INSPECTION ANALYSIS	CALCULATE THE ERIS SYSTEM RELIABILITY BASED ON TYPICAL USE AND SPARE PARTS.	THE SYSTEM AVAILABILITY IS GREATER THAN OR EQUAL TO THAT CONTAINED IN THE REQUIREMENTS.	KJB
98	VALIDATE THAT THE TRA SYSTEM IS CAPABLE OF STORING AMOUNT OF TRANSIENT DELTA DATA CONTAINED IN THE REQUIREMENTS	A. NONE B. REFER TO COLUMN 1 OF THIS MATRIX.	INSPECTION ANALYSIS	PERFORM THE ANALYSIS FOR A TYPICAL ERIS SYSTEM AND VERIFY THE NUMBER OF MEGABYTE OF STORAGE CAPABILITY AVAILABLE FOR RECORDING OF THE DELTA DATA IS GREATER THAN OR EQUAL TO THAT CONTAINED IN THE REQUIREMENTS.	REFER TO COLUMN 3.2 OF THIS MATRIX.	KJB

APPENDIX B

MAJOR V&V ACTIVITIES OF THE ERIS PROJECT

This Appendix describes the major V&V activities of the ERIS Project. Throughout the project validation and verification activities were performed. The major V&V activities are:

1. Regulatory requirement compliance verification
2. Safety evaluation of the basic RTAD subsystem
3. System document verification
4. Computer system hardware design document verification
5. Verification of software requirements and design specification and software source listings
6. Generic software validation
7. System field verification

B1. REGULATORY REQUIREMENT COMPLIANCE VERIFICATION

The system regulatory requirements are identified by the document identified as Reference 2. This document in turn invokes detailed requirements by referring to other regulatory and industrial standards documents. GESSAR II (Reference 3) verifies and demonstrates compliance to these requirements.

B2. SAFETY EVALUATION OF THE BASIC RTAD SUBSYSTEM

This evaluation is detailed in the document identified in Reference 4. This evaluation documents acceptance of the following, by US NRC:

1. Software engineering standards, convention and practices
2. Software verification and validation plan
3. Correct application of human factors engineering program in the design
4. Use of emergency procedure guidelines as a basis for parameter selection and correct selection of the parameters
5. Adequacy of the parameter validation algorithms
6. Adequacy of electrical and electronic isolation
7. System reliability

B3. SYSTEM DOCUMENT VERIFICATION

System document establishes design requirements for the system. Major system documents are:

1. System design specification
2. System application specification
3. System hardware configuration (instrument electrical diagram)
4. System application data specification
5. Plant interface document
6. Validation test requirement specification
7. Pre-operational test requirement specification
8. Startup test requirement specification

These documents were independently verified, by design review and/or engineering review memorandum, for the following:

1. Compliance to regulatory requirements and industrial standards
2. Compliance to the contract
3. Design accuracy and completeness
4. Design adequacy
5. Safety and reliability (if applicable)
6. Interface compatibility
7. System/plant application

B4. COMPUTER SYSTEM HARDWARE DESIGN DOCUMENT VERIFICATION

Major documents in this category include the following:

1. System elementary diagram and parts list
2. Hardware purchase specifications
3. Input/output list instruction

These documents in conjunction with the hardware vendors (operation, maintenance, installation and test) documents, the pre-operational test instructions and BWR systems elementary diagram are used to procure the system hardware, install it at the site, test the hardware, interface the system to the plant and check the correctness of the installation.

Above documents were verified by design review and/or engineering review memorandum.

B5. VERIFICATION OF SOFTWARE REQUIREMENTS AND DESIGN SPECIFICATIONS AND SOFTWARE SOURCE LISTINGS

The Software Requirement Specifications (SRS) were verified for compliance to the system design documents. The Software Design Specifications (SDS) were verified for compliance to the SRS. The software source listings are verified for compliance to the SDS. The software source listings were also verified/tested to ensure that the executable code is in accordance with the source listings. The method of verification was design review and/or engineering review memorandum.

B6. GENERIC SOFTWARE VALIDATION

During software development phase individual functions were tested for verification of compliance to the software requirement specifications. This test is identified as integration (static) test. The test was based on documented test plan and procedures. The integration test consists of a series of tests. Each test verifies one function at a time for operability and accuracy. The test specimen included multiple functions, but only one function was executed at a given time. The static tested generic ERIS software was integrated with lead plant data base and resulting software was dynamically tested. Realistic plant transients were simulated and a separate computer, (acting as a power plant) provided the plant inputs to the system being tested. During the test the results were logged and recorded. The results were subsequently reviewed for acceptance. The tested system has been archived and the test log/results are contained in the design record file.

B7. FIELD VERIFICATION AND TESTS

Following verifications and tests are recommended to be performed in the field:

1. Computer hardware operability verification

   Tests specified by hardware vendor should be performed to check accuracy of system installation and intrasystem connections.

2. Pre-operational test

   This test should be used to verify the connection of the system to other plant systems.

3. Integration test

   This test should be used to verify that the delivered software can perform the required functions.

4. System/startup test

   This test should be used to verify plant unique system data bases and total system operability in the plant environment.

APPENDIX C

ENGINEERING OPERATING AND PRODUCT QUALITY PRACTICES AND PROCEDURES

ENGINEERING OPERATING AND PRODUCT QUALITY PRACTICES
AND PROCEDURES MATRIX

V&V Practices and Procedures	Description	Reference(s)
1. Project Management and Responsibility Matrices	Organization and responsibilities for tasks associated with applicable life cycles of the software	*Engineering Operating Procedures (NEDE-21109) *Software Management Plan (G-81W-SMP-8430.1-0001) *Configuration Management Plan (G-81W-CMP-8429.5-0001)
2. Standards, Practices, and Conventions	Documentation standards, logic structure standards, code standards, and commentary standards which must be followed during the design process	*Document Preparation Guide (NEDS-24760) *Software Engineering Manual (NEDE-30682)
3. Independent Design Verification and Validation	Independent review and audit practices for all designs, documentation, and records. Reviewed material types include requirement specifications, design specifications, purchase specifications, data bases, test procedures, test results, etc. Practices include design reviews, engineering review memorandums, independent design verifications, independent validation test, etc.	*Engineering Operating Procedures (NEDE-21109) *Software Engineering Manual (NEDE-30682) *Software Management Plan (G-81W-SMP-8430.1-0001) *Configuration Management Plan (G-81W-CMP-8429.5-0001) *Verification and Validation Plan (NEDC-30675)

ENGINEERING OPERATING AND PRODUCT QUALITY PRACTICES
AND PROCEDURES MATRIX (Continued)

V&V Practices and Procedures	Description	Reference(s)
4. Software Configuration Management	Software item identification, control, change implementation, and status reporting.	*Configuration Management Plan (G-81W-8429.5-0001)
5. Engineering Change Control	Requirements for engineering documentation and configuration change control to ensure traceability.	*Engineering Operating Procedures (NEDE-21109)
6. Problem Reporting and Corrective Actions	Requirements and procedures for identifying, tracking, resolving, and documenting problems with Software Problem Reports, Corrective Action Reports, Field Deviation Disposition Requests, and Field Disposition Instructions, etc.	*Engineering Operating Procedures (NEDE-21109) *Software Management Plan (G-81W-SMP-8430.1-0001) *Configuration Management Plan (G-81W-CMP-8429.5-0001) *Software Engineering Manual (NEDE-30682)
7. Engineering Records Retention	Traceability and long term retention of key design documentation and software media.	*Engineering Operating Procedures (NEDE-21109) Configuration Management Plan (G-81W-CMP-8429.5-0001)
8. Software Tools, Techniques, and Methodologies	Tools, techniques, and methodologies employed on the specific project.	*Software Management Plan (G-81W-SMP-8430.1-0001) *Software Engineering Manual (NEDE-30682)

APPENDIX D

SUMMARY OF TYPICAL SOFTWARE PROBLEMS* DISCOVERED DURING ERIS SOFTWARE VALIDATION PROGRAM

*Method of software problem tracking and resolution is described in References 5, 6, 7 and 9.

D1. DATE: 11-MAR-1985 20:30:00:00

SPR NUMBER: VAL 8

PROBLEM STATEMENT:

It is necessary to change the working set size of A_ACT_PT_DP to 1000 to improve performance and minimize page faulting.

DATA: 11-MAR-1985 21:30:00:00

RESOLUTION:

DAS control executable and startup file with needed change are now available from the library.

D2. DATE: 12-MAR-1985

SPR NUMBER: VAL 12

PROBLEM STATEMENT:

Two separate composed points are required for the APRM DOWNSCALE limit tag (Toshiba tristate) and tail (analog). LRAPRMDN only composes the tristate tag point for the tag point for the tag. No code or instructions exist for the analog tail point.

Operator A31 is correct for the tristate tag. Need new module to translate tag status to tail per attached.

Required relationship between tristate tag and analog tail:

Tristate state, status	Analog value, status
TRI_INACTIVE, PSGOOD	APRM_DNSCL_LIM, PSGOOD
TRI_CAUTION, PSPALRM	APRM_DNSCL_LIM, PSPALRM
TRI_SAFE, PSGOOD	APRM_DNSCL_LIM, PSGOOD
TRI_INACTIVE, PSALARM	APRM_DNSCL_LIM, PSALARM

APRM_DNSCL_LIM is an input constant value

DATE: BLANK

RESOLUTION:

Corrections made as identified below:

APRM Downscale Limit Status Input List

(C95-4020 Paragraph 20.3.2.1.a, Data Table 3.2.2.2.1.c)

1. Point Name: APRM Downscale Limit Status
   Mnemonic : APRM_DNSCL_LIM_STAT (tag)
   Type : Composed Analog
   Rate : 1
   Offset : 0

Point Description	Hist Constant	Oprtr
SCRAM_STAT		
	APRM_DECAY_TIME	
	APRM_DNSCL_LIM	
VLDT_PAR (of RX_PWR)		A31

2. **Point Name:** APRM Downscale Limit State
   Mnemonic : APRM_DNSCL_LIM_STAT (tail)
   Type : Composed Analog
   Rate : 1
   Offset : 0

Point Description	Hist Constant	Oprtr
APRM_DNSCL_LIM_STAT (tag)		
	APRM_DNSCL_LIM	A95

D3. DATE: 12-MAR-1985

SPR NUMBER: VAL 16

PROBLEM STATEMENT:

Composed point on display requires an analog limit value (like 995 psig) to be supplied. The code module outputs only a value of zero and has no provision for inputting the limit value.

DATA: BLANK

RESOLUTION:

Corrections made as depicted below:

100% Bypass Valve Limit Status Input List

(C95-4020 Paragraph 20.3.2.1.b, Data Table 3.2.2.2.1.b)

1. Point Name: 100% Bypass Valve Limit Status
   Mnemonic : 100%_BPV_LIM_STAT
   Type : Composed Analog
   Rate : 1
   Offset : 0

Point Description	Hist Constant	Oprtr
VLDT_PAR (of RPV_PRESS)		
	100%_BPV_TIME	
SRV_OPEN_STAT		A30
	PROC_LIM (100% BPV LIM)	
		A95