

QA Record

B22 '88 0809 301



TENNESSEE VALLEY AUTHORITY
Division of Nuclear Engineering

880926T0265

(14)

BROWNS FERRY NUCLEAR PLANT

BFEP PI 86-26

TITLE: BASELINE TEST REQUIREMENTS

FOR INFORMATION ONLY

	REVISION RO	R1	R2	R3	R4	R5
ISSUE DATE	10/04/86	7/03/87	12/22/87	AUG 09 1988		
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TVA**BASELINE TEST REQUIREMENTS**

Title:

REVISION LCBFEP PI 86-26
REVISION 3

Revision No.	DESCRIPTION OF REVISION	Dot Appro
1	<p>Revised 1.0 - Purpose of Procedure to coincide with the Scope of Design Baseline and Verification Program.</p> <p>Revised 2.0 - Scope of Procedure to coincide with the Scope of Design Baseline and Verification Program. Clarified last sentence of paragraph on nonexistent component data.</p> <p>Revised 3.2 - Definition of SRC to be consistent with other Browns Ferry Engineering Procedures.</p> <p>Added 3.5 - Definition of System Design Criteria.</p> <p>Added 3.6 - Definition of Restart Test Engineer.</p> <p>Added 4.3 - Design Criteria as input information to the preparation of the BTRD. Also added Attachment F - List of Design Criteria.</p> <p>Revised Section 5.0 - Procedure to Reflect the Actual Process of Preparing the BTRD.</p> <p>Paragraph 5.4 was revised to reflect the identification number of the BTRD.</p> <p>Added interdisciplinary review to the cover sheet of the BTRD. See Attachment E.</p> <p>Added Attachment C - Format of BTRD.</p> <p>Added Attachment D - Format of Test Scoping Document.</p> <p>Added Section 7.0 - List of Attachments.</p>	7-3
2	<p>This revision addresses overall changes to the procedure where interfaces between procedures have not been adequately addressed. These areas are marked by revision bars.</p>	12/2
3	<p>The purpose of this revision is to allow partial change notices to be issued against the Baseline Test Requirements. These areas are marked by revision bars.</p>	AUG 01

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1.0 PURPOSE

The purpose of this procedure is to provide a document that specifies the scope of the functional tests considered necessary to demonstrate that the systems identified by the Design Baseline and Verification Program (DB&VP) (Phase I - Pre-Restart; Phase II - Post-Restart) will meet their safe shutdown requirements.

2.0 SCOPE

The scope of this procedure applies to the systems (or portions of systems) identified in the DB&VP (Phase I - Pre-Restart; Phase II - Post-Restart). This includes any detailed component testing or partial system testing as necessary to ensure the functional ability of the system as it is constructed.

3.0 DEFINITIONS

3.1 Baseline System Engineer (BSE)

A DNE engineer having responsibility for the safety evaluation portions of the design baseline and verification program activities for a given system.

3.2 System Requirements Calculation

A Nuclear Engineering Branch (NEB) calculation which defines for a given system all requirements for safe shutdown. See Attachment A for a list of calculation numbers by system.

3.3 Plant System Engineer

BFNP plant engineer cognizant for system activities.

3.4 Reviewer

An independent and technically qualified engineer assigned to verify the work of the preparer for correctness, technical adequacy, and compliance with design input.

3.5 System Design Criteria

Functional and design requirements that govern the design of structures, systems, and components.

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3.6 Restart Test Engineer

BFNP Person cognizant for assigned system test specification, restart test program (RTP), test preparation and RTP test conduct.

4.0 INPUT INFORMATION

- 4.1 Applicable design drawings, such as a flow diagram, control diagram, elementary diagram, or connection diagram.
- 4.2 System Requirements Calculations, (Attachment A).
- 4.3 System Design Criteria.

5.0 PROCEDURE

- 5.1 The BSE refers to the Systems Requirements Calculation and System Design Criteria as the source definitions of all operating modes required of the system and using the checklists given in Attachment B for guidance, the BSE prepares a list of functional tests that will demonstrate the system/component performance required for each system mode.
- 5.2 The BSE prepares the Baseline Test Requirement Document (BTRD) to cover all functional tests for the system and/or components, in accordance with NEP 10.4. See attachment C for the outline of the Baseline Test Requirement Documents.
- 5.3 Utilizing the format in Attachment D, the BSE shall prepare a test scoping document (TSD) for each functional test. All individual test scoping documents will be included as attachments to the BTRD.
- 5.4 The BSE prepares one Baseline Test Requirement Document cover sheet (Attachment E). The number assigned to the document shall be BFN-BTRD-XXX where XXX coincides with the last three numbers on the System Requirement Calculation number. (Example: BFN-BTRD-08 for Fuel Oil System).
- 5.5 The Baseline Test Requirement Document shall be reviewed in accordance with NEP 5.2 to confirm incorporation of all identified operating modes and technical adequacy. The document shall be approved by the Baseline Lead Discipline Engineer responsible for the preparation of the BTRD and issued. A copy shall be submitted for entry into the RIMS log.

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- 5.6 When the BTRD is issued, the document shall be transmitted by memorandum to the Manager, Restart Test Program, at the Browns Ferry Nuclear Plant site.
- 5.7 Overall revisions to the BTRD shall be processed with the same procedure as the original issue, steps 5.1 through 5.6 above.
- 5.8 Clarifications to the BTRD can be made via formal memorandum provided the technical content of the BTRD is not changed.
- 5.9 Partial revisions to the BTRD can be made in the following manner:
- 5.9.1 Use Attachment F to prepare and document the changes required to the BTRD.
 - 5.9.2 Ensures that review, approval and distribution are handled by the same organizations and method of the original BTRD.
 - 5.9.3 A limit of 4 partial revisions is allowed, then overall revision is required as described in section 5.7 to incorporate the partial changes.
 - 5.9.4 The DB&VP program manager shall issue a list of the BTRD latest revisions along with outstanding partial changes once a month until restart of BFN Unit 2 to ensure the latest revisions are being used by the Restart Test Program.
- 5.10 Implementation of the BTRD for actual testing is covered by SDSP 12.1 and 12.2 (references 6.4 and 6.5).

6.0 REFERENCES

- 6.1 System Requirements Calculation for the given system (Attachment A).
- 6.2 NEP 10.4, Test Scoping Document.
- 6.3 NEP 5.2, Review.
- 6.4 SDSP 12.1, Restart Test Program
- 6.5 SDSP 12.2, Development of System Test Specifications
- 6.6 NE Calculation, "System Mode Requirements for DB&VP Restart Plan" BFN-BFS3-050 (B30 870917 400)

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7.0 ATTACHMENTS

- 7.1 Attachment A - List of System Requirements Calculations
- 7.2 Attachment B - Checklist for Baseline Test Requirements
- 7.3 Attachment C - Format for Baseline Test Requirement Document
- 7.4 Attachment D - Format for Test Scoping Document
- 7.5 Attachment E - Baseline Test Requirement Document Cover Sheet
- 7.6 Attachment F - Baseline Test Requirement Document Change Form

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ATTACHMENT A

SYSTEM REQUIREMENTS CALCULATION

<u>Ident Number</u>	<u>Calculation Title</u>
BFN-BFS3-002	System Requirements For Diesel Air System
BFN-BFS3-004	System Requirements For Main Steam System
BFN-BFS3-005	System Requirements For Condensate Storage and Transfer System
BFN-BFS3-006	System Requirements For Reactor Feedwater System
BFN-BFS3-007	System Requirements For Boiler Drains and Vents
BFN-BFS3-008	System Requirements For Fuel Oil System
BFN-BFS3-009	System Requirements for RHR Service Water
BFN-BFS3-010	System Requirements for Raw Cooling Water
BFN-BFS3-011	System Requirements for Raw Service Water
BFN-BFS3-012	System Requirements For Condenser Circulation Water
BFN-BFS3-013	System Requirements For Ventilation System
BFN-BFS3-014	System Requirements For Air Conditioning System
BFN-BFS3-015	System Requirements For Control Air System
BFN-BFS3-016	System Requirements For Service Air System
BFN-BFS3-017	System Requirements For CO ₂ System
BFN-BFS3-018	System Requirements For Sampling and Water Quality
BFN-BFS3-019	System Requirements for Backup Control Communication
BFN-BFS3-020	System Requirements for Turbine Generator ECH System
BFN-BFS3-021	System Requirements for Standby Liquid Control System

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ATTACHMENT A

SYSTEM REQUIREMENTS CALCULATION
(Continued)

<u>Ident Number</u>	<u>Calculation Title</u>
BFN-BFS3-022	System Requirements For Primary Containment Isolation System
BFN-BFS3-023	System Requirements For 4kV Distribution System
BFN-BFS3-024	System Requirements For Secondary Containment System
BFN-BFS3-025	System Requirements For Switchyard and Miscellaneous Distribution
BFN-BFS3-026	System Requirements For EECW System
BFN-BFS3-027	System Requirements For Reactor Water Recirculation System
BFN-BFS3-028	System Requirements For Reactor Water Cleanup System
BFN-BFS3-029	System Requirements For Standby Gas Treatment System
BFN-BFS3-030	System Requirements For RBCCW System
BFN-BFS3-031	System Requirements For RCIC System
BFN-BFS3-032	System Requirements For HPCI System
BFN-BFS3-033	System Requirements For RHR System
BFN-BFS3-034	System Requirements For Core Spray System
BFN-BFS3-035	System Requirements For Containment Inserting
BFN-BFS3-036	System Requirements For Radwaste
BFN-BFS3-037	System Requirements For Fuel Pool Cooling
BFN-BFS3-038	System Requirements For Fuel Handling and Storage
BFN-BFS3-039	System Requirements For Diesel Generator System
BFN-BFS3-040	System Requirements For Containment Atmospheric Dilution

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ATTACHMENT A

SYSTEM REQUIREMENTS CALCULATION
(Continued)

<u>Ident Number</u>	<u>Calculation Title</u>
BFN-BFS3-041	System Requirements For Control Rod Drive
BFN-BFS3-042	System Requirements For Radiation Monitoring
BFN-BFS3-043	System Requirements For Neutron Monitoring
BFN-BFS3-044	System Requirements For Traversing Incore Probe
BFN-BFS3-045	System Requirements For Reactor Protection System
BFN-BFS3-046	System Requirements For 125-V Diesel Battery
BFN-BFS3-047	System Requirements For 208/120-V Supply Systems
BFN-BFS3-048	System Requirements For 250-V Distribution System
BFN-BFS3-049	System Requirements For 480-V Distribution System

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ATTACHMENT B

CHECKLIST FOR BASELINE TEST REQUIREMENTS

1. Have all the system operating modes been considered that are documented in the System Requirement Calculation (system mode data sheets), including all pertinent plant operating states?
2. Do the test requirements adequately cover the change in position (normal to mode position) of the tested components?
3. Do all parameters have acceptance criteria and numerical tolerance where appropriate?
4. Are all necessary interlocks included?
5. Is automatic positioning from a test mode to the operating mode included where applicable?
6. For some cooling and ventilation systems, the significant system performance is during plant power operation, when the normal heat loads are present. For those cases (if necessary), prepare a data sheet requesting historic power operation data, including a list of the parameters and instruments (by number) for which data is needed.
7. If the system conditions or plant conditions of interest (such as post-accidental environmental temperature or pressure) cannot be readily established during test, or were not present during normal power operation, sufficient and specific data should be requested to permit extrapolation to the conditions of interest as necessary.
10. If redundant chains are involved, is it necessary to test both chains?

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ATTACHMENT C

FORMAT

BASELINE TEST REQUIREMENT DOCUMENT

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 ASSUMPTIONS
- 4.0 REFERENCE DOCUMENTS
- 5.0 DOCUMENTATION OF ASSUMPTIONS
- 6.0 ANALYSIS
- 7.0 SUMMARY
- 8.0 CONCLUSION
- 9.0 LIST OF ATTACHMENTS
- 10.0 LIST OF TABLES
 - 10.1 REQUIRED TESTS
 - 10.2 COMPONENT POSITIONS

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ATTACHMENT D

FORMAT

TEST SCOPING DOCUMENT

- 1.0 SCOPE OF TESTING
- 2.0 TEST OBJECTIVES
- 3.0 REQUIRED SYSTEM CONFIGURATION
- 4.0 INITIAL SYSTEM CONDITIONS
- 5.0 SPECIAL TEST PRECAUTIONS
- 6.0 ACCEPTANCE CRITERIA
- 7.0 SPECIAL TEST EQUIPMENT OR INSTRUMENTS
- 8.0 ADEQUATE DETAILED DATA IN LIEU OF FULL ENVIRONMENTAL SIMULATION
- 9.0 TEST RECORD DRAWING LIST
- 10.0 REFERENCES

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ATTACHMENT E

BASELINE TEST REQUIREMENT

NUMBER: BFN-BTRD-XXX

SYSTEM NAME: _____	SYSTEM NUMBER _____		
REVISION	R0	R1	R2
Prepared	_____	_____	_____
Reviewed	_____	_____	_____
Interface Review	_____	_____	_____
NEB	_____	_____	_____
EEB	_____	_____	_____
MEB	_____	_____	_____
CEB	_____	_____	_____
APPROVED	_____	_____	_____
DATE	_____	_____	_____

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ATTACHMENT F

BASELINE TEST REQUIREMENT

CHANGE NOTICE

NUMBER: BFN-BTRD-XXX CN# (1-4 allowed)
(Appears on every sheet)

PURPOSE: [Describe reason for change to the base document (e.g. Test Exception, configuration change, etc.)]

REFERENCES: (Reference all applicable design input that supports the change to the document.)

JUSTIFICATION: (Document the technical basis for the change and show no adverse impact on system capability to meet its design bases requirements.)

DESCRIPTION: (Describe section(s) of BTRD that are affected and describe the changes that are to be made.)

Interface Review: MEB: _____ NEB: _____

EEB: _____ CEB: _____

Prepared by: _____ *

Reviewed by: _____ *

Approved by: _____ *

Date : _____ *

RIMS Number: _____ *

** Appears on last sheet only.

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