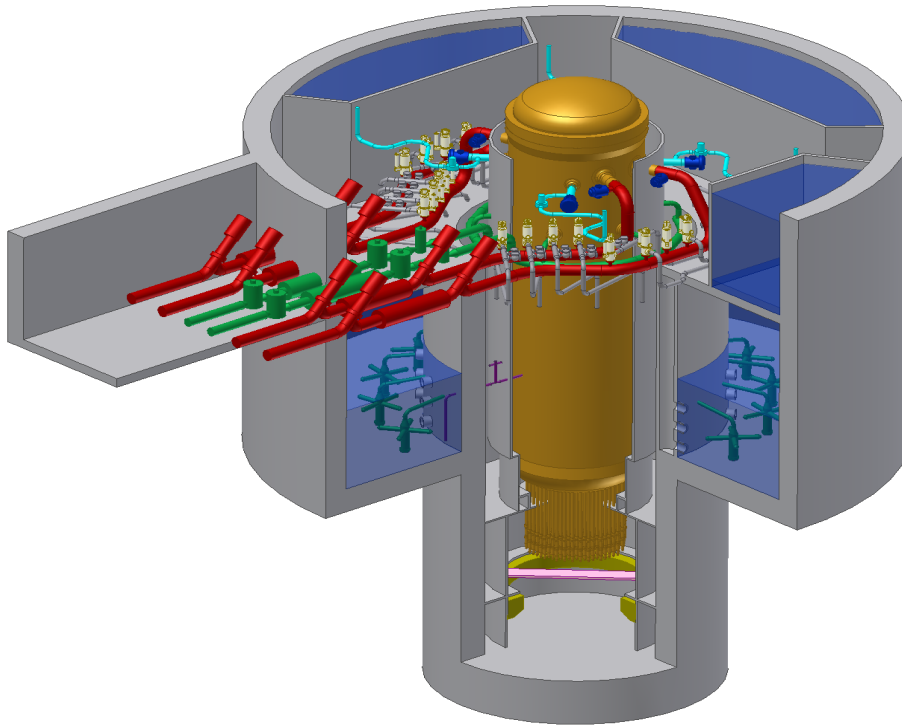




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ESBWR Design Control Document Tier 2 Chapter 13 *Conduct of Operations*



Contents

13.1 Organizational Structure Of Applicant	13.1-1
13.1.1 COL Information	13.1-1
13.2 Training	13.2-1
13.2.1 Reactor Operator Training	13.2-1
13.2.2 Training for Non-Licensed Plant Staff	13.2-1
13.2.3 COL Information	13.2-1
13.2.3.1 Incorporation of Operating Experience.....	13.2-1
13.2.3.2 Training Requirements for Preoperational and Low-Power Testing	13.2-1
13.2.4 References.....	13.2-1
13.3 Emergency Planning	13.3-1
13.3.1 Preliminary Planning	13.3-1
13.3.2 Emergency Plan	13.3-1
13.3.3 COL Information	13.3-1
13.3.3.1 Identification of OSC and Communication Interfaces with Control Room and TSC	13.3-1
13.3.3.2 Identification of EOF and Communication Interfaces with Control Room and TSC	13.3-2
13.3.3.3 Decontamination Facilities	13.3-2
13.3.4 References.....	13.3-2
13.4 Operational Program Implementation.....	13.4-1
13.4.1 COL Information	13.4-1
13.5 Plant Procedures.....	13.5-1
13.5.1 Administrative Procedures.....	13.5-1
13.5.2 Operating and Maintenance Procedures	13.5-1
13.5.3 COL Information	13.5-1
13.5.3.1 Plant Operating Procedures Development Plan.....	13.5-1
13.5.3.2 Emergency Procedures Development	13.5-1
13.5.3.3 Implementation of the Plan	13.5-2
13.5.3.4 Procedures Included In Scope Of Plan	13.5-2
13.5.4 References.....	13.5-3
13.6 Physical Security.....	13.6-1
13.6.1 Preliminary Planning	13.6-1
13.6.1.1 Site Physical Security	13.6-1
13.6.1.2 Security Policies and Procedures	13.6-3
13.6.1.3 COL Information	13.6-3
13.6.1.4 References.....	13.6-3

List of Tables

- NONE -

List of Illustrations

- NONE -

Abbreviations And Acronyms

<u>Term</u>	<u>Definition</u>
10 CFR	Title 10, Code of Federal Regulations
ANS	American Nuclear Society
ANSI	American National Standards Institute
COL	Combined Operating License
DCD	Design Control Document
DG	Draft Regulatory Guide
EOF	Emergency Operations Facility
ERDS	Emergency Response Data System
GE	General Electric Company
HFE	Human Factors Engineering
HSI	Human-System Interface
IAEA	International Atomic Energy Agency
IEEE	Institute of Electrical and Electronic Engineers
MCR	Main Control Room
NRC	Nuclear Regulatory Commission
NUREG	Nuclear Regulatory Commission Technical Report
OSC	Operational Support Center
PRA	Probabilistic Risk Assessment
RSS	Remote Shutdown System
SECY	Secretary of the Commission
SPDS	Safety Parameter Display System
SSC(s)	Structure, System and Component(s)
TEDE	Total Effective Dose Equivalent
TMI	Three Mile Island
TSC	Technical Support Center
V&V	Verification and Validation

13. CONDUCT OF OPERATIONS

This chapter provides information relating to the operational plans for the ESBWR. The purpose of this chapter is to provide reasonable assurance that the Combined Operating License (COL) applicant's organization will be able to operate the ESBWR in a manner that protects the public health and safety.

13.1 ORGANIZATIONAL STRUCTURE OF APPLICANT

This section is the responsibility of the COL applicant. The organizational structure must be consistent with the Human System-Interface (HSI) design assumptions used in the design of the ESBWR. These assumptions are described in Design Control Document (DCD) Chapter 18.

13.1.1 COL Information

COL applicant referencing the ESBWR will submit documentation that demonstrates that their organizational structure is consistent with the ESBWR Human Factors Engineering (HFE) design requirements.

13.2 TRAINING

13.2.1 Reactor Operator Training

The Training Program Development for Reactor Operator Training is described in Subsection 18.10. The Implementation of Licensed Operator Training Program validation of baseline training documentation in the full scope simulator is described in Subsection 18.12. The Monitoring of Licensed Operator Training Program validation over the operating cycle (and after changes to the plant, staffing, and training program) by analyzing and trending full scope simulator performance is described in Subsection 18.13.

13.2.2 Training for Non-Licensed Plant Staff

Non-licensed Operator training is described in Subsection 18.10, Training Program Development. The Monitoring of Non-Licensed Operator Training Program validation over the operating cycle (and after changes to the plant, staffing, and training program) by analyzing and trending plant human performance data is described in Subsection 18.13.

13.2.3 COL Information

13.2.3.1 Incorporation of Operating Experience

The results of reviews of operating experience shall be incorporated into training and retraining programs in accordance with the provisions of Three Mile Island (TMI) Action Item I.C.5, (NUREG-0737). The organizational responsibilities for accomplishing this shall be clearly identified. The Operator Experience Review input to the Training Program is described in Subsection 18.3.

13.2.3.2 Training Requirements for Preoperational and Low-Power Testing

A training program for the plant staff will be developed. The program will include all phases of plant operation including preoperational testing and low-power operation in accordance with the provisions of TMI Action Item I.G.1 (NUREG-0737). The Plant Staff Training Program Development is described in Subsection 18.10.

13.2.4 References

13.2-1 NUREG-0737, Clarification of TMI Action Plan Requirements, November 1980.

13.3 EMERGENCY PLANNING

Emergency planning is not within the scope of the ESBWR design. However, design features, facilities, functions, and equipment necessary for emergency planning are considered in the design bases of the standard plant.

The ESBWR Standard Plant complies with all the Technical Support Center (TSC) design requirements. Specifically, a TSC of sufficient size to support 26 people is located in the electrical building. Display capability in the TSC includes a workstation that at a minimum is capable of displaying the parameters that are required of a Safety Parameter Display System (SPDS). The SPDS function is described in GE Report NEDO-33217, Man Machine Interface System and Human Factor Engineering Implementation Plan, under separate cover.

The TSC is environmentally controlled to provide room air temperature, humidity and cleanliness appropriate for personnel and equipment.

The room is provided with radiological protection and monitoring equipment necessary to ensure that radiation exposure to any person working in the TSC would not exceed 0.05 Sv (5 rem) Total Effective Dose Equivalent (TEDE) as defined in 10 Code of Federal Regulations (CFR) 50.2 for the duration of the accident. The level of protection is similar to the Main Control Room (MCR).

The TSC is provided with reliable voice and data communication with the main control room and Emergency Operations Facility (EOF) and reliable voice communications with the Operational Support Center (OSC), Nuclear Regulatory Commission (NRC) Operations Centers and state and local operations centers. Control room data communication of Emergency Response Data System (ERDS) data with the NRC Operations Centers will also be provided as appropriate.

13.3.1 Preliminary Planning

Not required.

13.3.2 Emergency Plan

To be provided by the COL applicant.

13.3.3 COL Information

13.3.3.1 Identification of OSC and Communication Interfaces with Control Room and TSC

The COL applicant is responsible for identifying the OSC and the communication interfaces for inclusion in the detailed design of the control room and TSC. The detailed requirements are provided in Section 3 of NUREG-0696.

The OSC communications system shall have at least one dedicated telephone extension to the control room, one dedicated telephone extension to the TSC, and one telephone capable of reaching on-site and off-site locations, as a minimum. Any supplemental communications systems are also to be specified by the COL applicant as appropriate.

The COL applicant will identify the OSC and the communication interfaces for inclusion in the detailed design of the control room and the TSC.

13.3.3.2 Identification of EOF and Communication Interfaces with Control Room and TSC

The EOF is not within the scope of the ESBWR Standard Plant. It is the responsibility of the COL applicant to identify the EOF and the communication interfaces for inclusion in the detailed design of the TSC and control room. The detailed requirements are provided in Section 4 of NUREG-0696.

The COL applicant will identify the EOF and the communication interfaces for inclusion in the detail design of the TSC and control room.

The COL applicant is responsible for the design of the communication system and the backup power supply for non-portable communication equipment located in the EOF in accordance with 10 CFR 73.55(e), 10 CFR 73.55(f) and NUREG-0696.

13.3.3.3 Decontamination Facilities

In a building adjacent to the main change rooms, decontamination facilities for use by on-site individuals will be provided. Showers and waste collection equipment will be used to ensure spread of contamination is controlled and disposal cost of waste material is minimized. The central location is convenient to health physics support personnel who will supervise this activity.

The COL applicant will provide decontamination facilities and supplies at the site for decontamination of on-site individuals in the service building adjacent to the main change rooms.

13.3.4 References

- 13.3-1 NEDO-33217, Man Machine Interface System and HFE Implementation Plan. Revision 1, January 2006.
- 13.3-2 NUREG-0696, Functional Criteria for Emergency Response Facilities, December 1980.

13.4 OPERATIONAL PROGRAM IMPLEMENTATION

To be provided by the COL applicant.

13.4.1 COL Information

The COL applicant shall provide a plan for implementation of the Operational Programs. Operational programs are specific programs that are required by regulation. The Operational Programs should be fully described, as defined in SECY-05-0197 and Draft Regulatory Guide (DG)-1145, in an application for a combined license. The COL applicant will provide implementation milestones for all operation programs that are required by NRC regulation.

13.5 PLANT PROCEDURES

13.5.1 Administrative Procedures

The development of Administrative Procedures is described in Subsection 18.9, "Procedure Development".

13.5.2 Operating and Maintenance Procedures

The development of Maintenance Procedures is described in Subsection 18.9, "Procedure Development".

13.5.3 COL Information

13.5.3.1 Plant Operating Procedures Development Plan

A Plant Operating Procedures Development Plan shall be generated which establishes:

- That the scope encompassed by the procedures development process includes those operating procedures defined in Subsection 13.5.3.4, which direct operator actions during normal, abnormal and emergency operations, including consideration of plant operations during periods when plant systems/equipment are undergoing test, maintenance or inspection.
- The methods and criteria for the development, verification and validation, implementation, maintenance and revision of procedures. The methods and criteria shall be in accordance with TMI Item I.C.1 (NUREG-0737).

13.5.3.2 Emergency Procedures Development

In addition to the above, for Emergency Procedures development, the plan shall establish:

- That a writer's guide shall be developed and implemented which defines the process for developing emergency procedures. The writer's guide will contain objective criteria that require that the emergency procedures developed are consistent in organization, style, content and usage of terms.
- The form and content of the documentation describing the emergency procedure development activity results which includes, but is not limited to:
 - The objectives of the emergency procedure development process,
 - The methods employed during emergency procedure development,
 - Deviations from generic technical guidelines approved by the NRC and
 - Discussion of any design change recommendations and/or negative implications that the current design may have on safe operation as a result of emergency procedures development plan implementation.

13.5.3.3 Implementation of the Plan

Implementation of the Plant Operating Procedures Development Plan shall establish:

- Procedures that are consistent with the requirements of 10 CFR Part 50 and the TMI requirements described in NUREG-0737 and Supplement 1 to NUREG-0737.
- Requirements that the procedures developed shall include, as necessary, the elements described in American National Standards Institute (ANSI)/American Nuclear Society (ANS)-3.2 1994: R1999, as endorsed by Regulatory Guide 1.33 Rev. 2.
- That the operator actions identified in the vendors task analysis and Probabilistic Risk Assessment (PRA) efforts in support of the Standardized Design certification, Standardized Plant Design Emergency Procedure Guidelines and consideration of plant-specific equipment selection and site-specific elements such as the service water intake structure and the ultimate heat sink shall be used as a basis for specifying plant operating procedures.
- The definition of the methods through which specific operator skills and training needs, as may be considered necessary for reliable execution of the procedures, will be identified and documented.
- That the procedures specified above shall be made available for the purposes of the Human Factors Verification and Validation (V&V) Implementation Plan described in GE Report NEDO-33276 provided under separate cover.
- Procedures for the incorporation of the results of operating experience and the feedback of pertinent information into plant procedures in accordance with the provisions of TMI I.C.5 (NUREG-0737).

13.5.3.4 Procedures Included In Scope Of Plan

The following procedures shall be included in the scope of the Plant Operating Procedures Development Plan described above:

System Procedures

Procedures as delineated in Section A3 of ANSI/ANS-3.2 1994: R1999, as endorsed by Regulatory Guide 1.33 Rev. 2, shall be prepared as appropriate.

Procedures For Off-Normal Or Alarm Conditions

Procedures for off-normal or alarm conditions that require operator action in the MCR and Remote Shutdown System (RSS) shall be prepared as appropriate.

General Plant Operating Procedures

As discussed in Section A5 of ANSI/ANS-3.2 1994: R1999, as endorsed by Regulatory Guide 1.33 Rev. 2, procedures shall be prepared for the integrated operations of the plant.

Procedures for Combating Emergencies and Other Significant Events

As discussed in Section A10 of ANSI/ANS-3.2, 1994: R1999, as endorsed by Regulatory Guide 1.33 Rev. 2, procedures shall be provided to guide operations in emergencies and other significant events.

Procedures for Maintenance and Modification

Maintenance and modification procedures that require operator actions to be taken in the MCR or RSS shall be prepared as appropriate.

Procedures for Radiation Control

Procedures for the control of radioactive releases as discussed in Section A7 (d) of ANSI/ANS-3.2 1994: R1999, as endorsed by Regulatory Guide 1.33 Rev. 2, shall be prepared as appropriate.

Procedures for Calibration, Inspection and Testing

Calibration, inspection and testing procedures that require operator actions to be taken in the MCR or RSS shall be prepared as appropriate. The COL holder will ensure that all portions of the safety-related logic circuitry are adequately covered in the surveillance procedures as described in Generic Letter 96-01.

13.5.4 References

- 13.5-1 NEDO-33276, ESBWR HFE Verification and Validation Implementation Plan, Revision 0, May 2006.
- 13.5-2 ANSI/ANS-3.2-1994: R1999, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants.
- 13.5-3 NUREG-0737, Clarification of TMI Action Plan Requirements, November 1980.

13.6 PHYSICAL SECURITY

13.6.1 Preliminary Planning

13.6.1.1 Site Physical Security

13.6.1.1.1 Security Organization

13.6.1.1.2 Physical Barriers

13.6.1.1.3 Detection Aids

13.6.1.1.4 Communications

13.6.1.1.5 Access Controls

13.6.1.1.6 Security Lighting

13.6.1.1.7 Security Power Supply

13.6.1.1.8 Testing and Maintenance of Security Systems

13.6.1.2 Security Policies and Procedures***13.6.1.3 COL Information*****13.6.1.3.1 Physical Security Plan****13.6.1.3.2 Contingency Plan****13.6.1.3.3 Guard Force Training Plan****13.6.1.3.4 Physical Security Systems Design****13.6.1.3.5 Security System Testing and Maintenance*****13.6.1.4 References***

