

## **18.0 Human Factors Engineering**

### **18.1 Introduction**

This chapter describes the human-system interface system (HSI) design development, the HSI design goals and bases, the standard HSI design features and the detailed HSI design and implementation process, with embedded design acceptance criteria, for the ABWR. The ABWR Emergency Procedure Guidelines and the inventory of instrumentation and controls needed by the control room staff for the performance of emergency operating procedures are also described. The incorporation of human factors engineering (HFE) principles into all phases of the design of these interfaces is provided for as described in this chapter.

Design goals and design bases for the HSI in the main control room and in remote locations are established in Section 18.2. The overall design and implementation approach is described in Section 18.3. Section 18.4 contains a description of the main control room standard HSI design features and HSI technologies. The Remote Shutdown System is described in Section 18.5. Section 18.6 discusses how the systems which make up the HSI are integrated together and with the other systems of the plant. Section 18.7 discusses the detailed design implementation process. Section 18.8 discusses the HFE related COL license information requirement. The ABWR Emergency Procedure Guidelines, which provide the basis for a human factors evaluation of emergency operations, are contained in Appendix 18A. Appendix 18B discusses the differences between the ABWR Emergency Procedure Guidelines and the U.S. BWROG Emergency Procedure Guidelines, Revision 4. Appendix 18C presents a characterization of a main control room HSI equipment implementation that incorporates the ABWR standard design features discussed in Section 18.4. The input data and results of calculations performed during the preparation of the ABWR Emergency Procedure Guidelines are contained in Appendix 18D. A general description of the design and implementation process for the ABWR HSI is presented in Appendix 18E. Appendix 18F contains the results of the requirements for an analysis of information and control needs of the standard control room operators during emergency operations. The design development and validation testing of the standard control room design features equipment and configuration are described in Appendix 18G.