18.2 Design Goals and Design Bases

The primary goal for HSI designs is to facilitate safe, efficient, and reliable operator performance during all phases of normal plant operation, abnormal events, and accident conditions. To achieve this goal, information, displays, controls, and other interface devices in the control room and other plant areas are designed and implemented in a manner consistent with good HFE practices. Further, the following specific design bases are adopted:

(1) During all phases of normal plant operation, abnormal events and emergency conditions, the ABWR shall be operable by two reactor operators. In addition, the operating crew will include one assistant control room shift supervisor, one control room shift supervisor, and two or more auxiliary equipment operators. During accidents, assistance is available to the operating crew from personnel in the Technical Support Center. Four licensed operators shall be on shift at all times, consistent with the staffing requirements of 10CFR50.54(m). The main control room staff size and roles shall be evaluated by the COL applicant (Subsection 18.8.2).

(2) The HSI design will promote efficient and reliable operation through application of automated operation capabilities.

(3) The HSI design shall utilize only proven technology.

(4) Safety-related systems monitoring displays and control capability shall be provided in full compliance with pertinent regulations regarding electrical separation and independence.

(5) The HSI design shall be highly reliable and provide functional redundancy such that sufficient displays and control will be available in the main control room and remote locations to conduct an orderly reactor shutdown and to cool the reactor to cold shutdown conditions, even during design basis equipment failures.

(6) The principle functions of the Safety Parameter Display System (SPDS) as required by Supplement 1 to NUREG-0737, will be integrated into the HSI design.

(7) Accepted HFE principles shall be utilized for the HSI design in meeting the relevant requirements of General Design Criterion 19.

(8) The design bases for the Remote Shutdown System shall be as specified in Section 7.4.