19.7 PRA as a Design Tool

The information in this section of the reference ABWR DCD, including all subsections, is incorporated by reference with the following departures.

STD DEP T1 3.4-1

STD DEP 19.7-1

STP DEP 19R-1

STD DEP 8.3-1

19.7.2 Early PRA Studies

STD DEP T1 3.4-1

STD DEP 19.7-1

(3) Instrumentation Studies

An ABWR instrument reduction study and reliability assessment enabled the elimination of 60% of the sensor instrumentation in the reactor safety systems without impacting plant safety. Other studies performed have identified significant cost reductions in the ABWR ~~multiplexing~~ data communication *systems and ~~other~~ instrumentation systems.*

(4) Control Rod Drive Improvements

The FMCRD brake mechanism is provided to prevent a rod ejection in the event of a break of the scram insert line. As a result of PRA studies, the design was changed from the centrifugal-type brake used in the early design to the current electro-mechanical-type ~~break~~ brake*. The PRA studies indicated that the brake design had to be fully testable on ~~an annual~~* refueling cycle *basis to meet the goals for rod ejection frequency. It was determined that the electro-mechanical brake design was easier to test, and would not have any impact on the plant outage critical path.*

19.7.3 PRA Studies During the Certification Effort

STD DEP 8.3-1

(2) Feature Descriptions and Resulting Benefits

(b) Combustion Turbine Generator

The CTG is designed to supply standby power to the three turbine building (non-Class1E) ~~6.9kV~~ 4.16 kV *buses which carry the plant investment protection loads. The CTG automatically starts on detection of a 30% voltage drop on the ~~6.9kV~~* 4.16kV *bus. The ~~6.9kV~~* 4.16 kV *bus is tripped and the CTG sequentially assumes the loads.*

STD DEP 19R-1

(4) Further Improvements

- ~~*a limitation on the reactor service water (RSW) pipe length to the first RSW isolation valve to limit the water volume which could be drained into the control building following isolation of a RSW break, addition of anti-siphon capability to the RSW System to prevent siphoning the ultimate heat sink into the control building;*~~

- *and floor drains, sump overfill lines, and water tight doors in the reactor building* and reactor service water pump house *to prevent floods from having significant impact.*