18.6 Systems Integration

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

STD DEP T1 3.4-1

18.6.1 Safety-Related Systems

Divisional separation for control, alarm and display equipment is maintained. The SSLC processors provide alarm signals to their respective safety-related alarm processors and provide display information to the divisionally dedicated VDUs. The SSLC microprocessors communicate with their respective divisional VDU controllers through the Essential ~~Multiplexing System (EMUX)~~ Communication Function*. The divisional VDUs have on screen control capability.*

SSLC also provides the plant safety-related systems status information (including alarms) to the plant non-safety-related communication network. Divisional isolation devices are provided between the safety-related systems and non safety-related communication networks so that failures in the non-safety-related equipment will have no impact on the ability of the safety-related systems to perform their design functions. The non-safety-related communication network is part of the ~~nonessential Multiplex System (NEMS)~~ Non-Essential Communication Function *described in Subsection 7.7.1.9.*

The information in this subsection of the reference ABWR DCD is supplemented with the following information.

The instrumentation and control systems architecture is not identical to the conceptual design described in Appendix 18C. The changes in the next paragraph reflect the architecture and configuration.

Selected operator control functions are performed through dedicated hardware control switches which are Class 1E qualified and divisionally separated on the main control console. These hardware switches, and safety-related fixed-position displays, *communicate with the SSLC safety-related systems logic units through hardwire signal transmission lines~~(i.e., not multiplexed). Communication between the SSLC logic units and alarm panels and the safety-related fixed-position displays is through multiplexed data links~~.*

18.6.2 Non-Safety-Related Systems

The non-safety-related systems communicate with other equipment in the operator interface through the ~~NEMS network~~ Non-Essential Communication Function*. The non-safety-related portion of the large display panel fixed-position displays is driven by a controller separate from the ~~process computer system~~* plant computer functions*. Alarm processing microprocessor units separate from the ~~process computer~~* plant computer functions *perform alarm filtering and suppression and also drive dedicated alarm tiles on the large display panel. The alarms for entry conditions into the symptomatic emergency operating procedures are provided by the alarm processing*

units, both safety and non safety-related. Equipment level alarm information is presented by the ~~process computer~~ plant computer functions *on the main control console VDUs.*

~~*An additional set of non-safety-related on-screen control VDUs is provided on the main control console for control and display of non-safety systems. These VDUs are independent of the* **process computer system*** plant computer functions*. In the unlikely event of loss of the process computer system* plant computer functions*, these independent VDUs, in conjunction with the large display panel safety-related displays, have sufficient information and control capability to allow the following operations to be performed:*~~

~~*(1) Steady-state power operation*~~

~~*(2) Power decrease*~~

~~*(3) Plant shutdown to hot standby conditions*~~

~~*(4) Plant shutdown to cold shutdown conditions*~~

~~*Without the plant process computer system* plant computer functions*, control is carried out through the master sequential switches and the process computer* plant computer functions *independent, on-screen control VDUs. Monitoring is accomplished with the independent VDUs and the fixed-position display on the large display panel. Power increases cannot be performed in the absence of the* **process computer system*** plant computer functions *because core thermal margin limit information provided by the* **process computer*** plant computer functions *to the automated thermal limit monitor (Subsection 7.7.2.2) would not be available.*~~