

Table 2.5.1-4 Inspections, Tests, Analyses, and Acceptance Criteria				
No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
520	2.5.01.05	5. The DAS manual actuation of ADS, IRWST injection, and containment recirculation can be executed correctly and reliably.	See ITAAC Table 3.2-1, item 1.	See ITAAC Table 3.2-1, item 1.

Table 2.5.1-5		
Component Name	Tag No.	Component Location
DAS Processor Cabinet 1	DAS-JD-001	Auxiliary Building
DAS Processor Cabinet 2	DAS-JD-002	Auxiliary Building
DAS Squib Valve Control Cabinet	DAS-JD-003	Auxiliary Building

## 2.5.2 Protection and Safety Monitoring System

### Design Description

The protection and safety monitoring system (PMS) initiates reactor trip and actuation of engineered safety features in response to plant conditions monitored by process instrumentation and provides safety-related displays. The PMS has the equipment identified in Table 2.5.2-1. The PMS has four divisions of Reactor Trip and Engineered Safety Features Actuation, and four divisions of safety-related post-accident parameter displays. The functional arrangement of the PMS is depicted in Figure 2.5.2-1 and the component locations of the PMS are as shown in Table 2.5.2-9.

1. The functional arrangement of the PMS is as described in the Design Description of this Section 2.5.2.
2. The seismic Category I equipment, identified in Table 2.5.2-1, can withstand seismic design basis loads without loss of safety function.
3. The Class 1E equipment, identified in Table 2.5.2-1, has electrical surge withstand capability (SWC), and can withstand the electromagnetic interference (EMI), radio frequency interference (RFI), and electrostatic discharge (ESD) conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.
4. The Class 1E equipment, identified in Table 2.5.2-1, can withstand the room ambient temperature, humidity, pressure, and mechanical vibration conditions that would exist before, during, and following a design basis accident without loss of safety function for the time required to perform the safety function.

<b>Table 2.5.2-1 PMS Equipment Name and Classification</b>			
<b>Equipment Name</b>	<b>Seismic Cat. I</b>	<b>Class 1E</b>	<b>Qual. for Harsh Envir.</b>
PMS Cabinets, Division A	Yes	Yes	No
PMS Cabinets, Division B	Yes	Yes	No
PMS Cabinets, Division C	Yes	Yes	No
PMS Cabinets, Division D	Yes	Yes	No
Reactor Trip Switchgear, Division A	Yes	Yes	No
Reactor Trip Switchgear, Division B	Yes	Yes	No
Reactor Trip Switchgear, Division C	Yes	Yes	No
Reactor Trip Switchgear, Division D	Yes	Yes	No
MCR/RSW Transfer Panels	Yes	Yes	No
MCR Safety-related Display, Division A	Yes	Yes	No
MCR Safety-related Display, Division B	Yes	Yes	No
MCR Safety-related Display, Division C	Yes	Yes	No
MCR Safety-related Display, Division D	Yes	Yes	No
MCR Safety-related Controls	Yes	Yes	No

<b>Table 2.5.2-2 PMS Automatic Reactor Trips</b>
Source Range High Neutron Flux Reactor Trip Intermediate Range High Neutron Flux Reactor Trip Power Range High Neutron Flux (Low Setpoint) Trip Power Range High Neutron Flux (High Setpoint) Trip Power Range High Positive Flux Rate Trip Reactor Coolant Pump High Bearing Water Temperature Trip Overtemperature Delta-T Trip Overpower Delta-T Trip Pressurizer Low Pressure Trip Pressurizer High Pressure Trip Pressurizer High Water Level Trip Low Reactor Coolant Flow Trip Low Reactor Coolant Pump Speed Trip Low Steam Generator Water Level Trip High-2 Steam Generator Water Level Trip Automatic or Manual Safeguards Actuation Trip Automatic or Manual Depressurization System Actuation Trip Automatic or Manual Core Makeup Tank (CMT) Injection Trip Passive Residual Heat Removal (PRHR) Actuation Reactor Trip

Table 3.1-1

## Inspections, Tests, Analyses, and Acceptance Criteria

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
733		Verified on VEGP Unit 3		
734	3.1.00.02	2. The TSC has voice communication equipment for communication with the MCR, emergency operations facility, OSC, and the NRC.	An inspection and test will be performed of the TSC voice communication equipment.	Communications equipment is installed, and voice transmission and reception are accomplished.
735	3.1.00.03	3. The plant parameters listed in Table 2.5.4-1, minimum inventory table, in subsection 2.5.4, DDS, with a "Yes" in the "Display" column, can be retrieved in the TSC.	An inspection will be performed for retrievability of the plant parameters in the TSC.	The plant parameters listed in Table 2.5.4-1, minimum inventory table, in subsection 2.5.4, DDS, with a "Yes" in the "Display" column, can be retrieved in the TSC.
736	3.1.00.04	4. The OSC has voice communication equipment for communication with the MCR and TSC.	Inspection will be performed of the OSC voice communication equipment.	Communications equipment is installed, and voice transmission and reception are accomplished.
737	3.1.00.05	5. The TSC and OSC are in different locations.	An inspection will be performed of the location of the TSC and OSC.	The TSC and OSC are in different locations.
738	3.1.00.06	6. The CSA provides a habitable workspace environment.	See ITAAC Table 2.7.1-4, items 1, 8.a), 8.c), 12, and 13, Nuclear Island Nonradioactive Ventilation System.	See ITAAC Table 2.7.1-4, items 1, 8.a), 8.c), 12, and 13, Nuclear Island Nonradioactive Ventilation System.

## 3.2 Human Factors Engineering

### Design Description

The AP1000 human-system interface (HSI) will be developed and implemented based upon a human factors engineering (HFE) program. Figure 3.2-1 illustrates the HFE program elements. The HSI scope includes the design of the operation and control centers system (OCS) and each of the HSI resources. For the purposes of the HFE program, the OCS includes the main control room (MCR), the remote shutdown workstation (RSW), the local control stations, and the associated workstations for each of these centers. The HSI resources include the wall panel information system, alarm system, plant information system (nonsafety-related displays), qualified safety-related displays, and soft and dedicated controls. Minimum inventories of controls, displays, and visual alerts are specified as part of the HSI for the MCR and the RSW.

The MCR provides a facility and resources for the safe control and operation of the plant. The MCR includes a minimum inventory of displays, visual alerts and fixed-position controls. Refer to item 8.a and Table 2.5.2-5 of subsection 2.5.2 for this minimum inventory.