

## 7. INSTRUMENTATION AND CONTROLS

### 7.1 INTRODUCTION

Not all subsystems of the Instrumentation and Control Systems are required to support permanent plant shutdown or defueled operations. The status of these subsystems is listed in the table below. Design Basis, Licensing Basis, and operational information in this chapter has been updated to reflect the current status. Although the subsystems removed or partially removed from service no longer support operation, they may still contain fluids, gases or other hazards such as energized circuits, compressed air, radioactive material, etc. Equipment may not have been physically removed from the plant. See General Arrangement Drawings, P&IDs, One-Line diagrams for the current plant configuration.

<b><u>STRUCTURES/SYSTEMS/COMPONENTS</u></b>	<b><u>STATUS</u></b>
Plant Protection System (PPS)	Removed from Service
Engineered Safety Feature (ESF) System	Removed from Service
Auxiliary Supporting Systems	Removed from Service
Systems Required for Safe Shutdown	Removed from Service
Safety-Related Display Instrumentation	Removed from Service
All Other Systems Required for Safety	Removed from Service
Control Systems Not Required for Safety	Partially Removed from Service

#### 7.1.1 IDENTIFICATION OF SAFETY RELATED SYSTEMS

The instrumentation and controls systems removed from service are identified below.

##### 7.1.1.1 Plant Protection System (PPS)

The PPS systems removed from service are:

<b><u>STRUCTURES/SYSTEMS/COMPONENTS</u></b>	<b><u>STATUS</u></b>
Reactor Protective System (RPS) (NSSS)	Removed from Service
Engineered Safety Features (ESF) Actuation System	Removed from Service

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7.1.1.2 Engineered Safety Feature (ESF) Systems

The ESF systems removed from service are:

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Safety Injection (SIAS)	Removed from Service
Containment Emergency Sump Recirculation (RAS)	Removed from Service
Containment Spray (CSAS)	Removed from Service
Containment Isolation (CIAS)	Removed from Service
Containment Purge Isolation (CPIS)	Removed from Service
Main Steam Isolation (MSIS)	Removed from Service
Auxiliary Feedwater (EFAS)	Removed from Service
Containment Cooling (CCAS)	Removed from Service
Control Room Isolation (CRIS)	Removed from Service
Toxic Gas Isolation (TGIS)	Removed from Service

7.1.1.3 Auxiliary Supporting Systems

The auxiliary supporting systems removed from service are:

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Salt Water-Cooling System	Removed from Service
Component Cooling Water System	Removed from Service
Diesel Generator System	Removed from Service
Emergency Chilled Water System	Removed from Service
Heating, Ventilating and Air Conditioning (HVAC) Systems	Removed from Service
Onsite Power System	Available (See Chapter 8)

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7.1.1.4 Systems Required for Safe Shutdown

The required for safe shutdown systems removed from service are:

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Auxiliary Feedwater System (Non-NSSS)	Removed from Service
Atmospheric Steam Dump System (Non-NSSS)	Removed from Service
Shutdown Cooling System (NSSS)	Removed from Service
Chemical And Volume Control System (Charging And Boric Acid Makeup Portion) (NSSS)	Removed from Service
Reactor Coolant System (NSSS)	Removed from Service
Main Steam System Integrity Up To And Including Main Steam Isolation Valves (MSIVs) (NSSS)	Removed from Service
Reactor Protection System (RPS) (Reactor Trip Manual Pushbuttons In Control Room, Reactor Trip Actuation Circuitry Downstream Of Manual Pushbuttons, And Reactor Trip Breakers (RTBS) Only) (NSSS)	Removed from Service
Containment Emergency Cooling	Removed from Service

7.1.1.5 Safety-Related Display Instrumentation

The safety-related displays removed from service are:

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Reactor Protective System	Removed from Service
Engineered Safety Features Systems	Removed from Service
Auxiliary Support Systems	Removed from Service
Plant Process Instrumentation	Removed from Service
Bypass And Inoperable Status Indication	Removed from Service
Post-Accident Monitoring Instrumentation	Removed from Service
Control Element Assembly (CEA) Position	Removed from Service
Remote Shutdown Panel Instrumentation	Removed from Service
Pressurizer Safety Valve Position Indication	Removed from Service
Instrumentation For Detection Of Inadequate Core Cooling	Removed from Service

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7.1.1.6 All Other Systems Required for Safety

The status of all other systems required for safety is listed below.

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Shutdown Cooling Interlocks	Removed from Service
Safety Injection Tank Isolation Valve Interlocks	Removed from Service
Critical Function Monitoring System (CFMS)	Removed from Service
Dose Assessment Computer System	Removed from Service
CFMS Historical Data Storage And Retrieval	Removed from Service
Draindown Reactor Water Level Indication	Removed from Service
Fuel Handling Interlocks	Available (See Chapter 9)
Anticipated Transient Without Scram/Diverse Scram System (ATWS/DSS)	Removed from Service
Anticipated Transient Without Scram/Diverse Emergency Feedwater Actuation System (ATWS/EFAS)	Removed from Service
Data Acquisition System (DAS)	Removed from Service

7.1.1.7 Control Systems Not Required for Safety

The status of control and instrumentation systems is listed below:

<b>STRUCTURES/SYSTEMS/COMPONENTS</b>	<b>STATUS</b>
Reactivity Control – CEA Control	Removed from Service
Reactivity Control – Boron Control	Removed from Service
Pressurizer Control – Pressure Control	Removed from Service
Pressurizer Control – Level Control	Removed from Service
Feedwater Control	Removed from Service
Steam Flow Control – Steam Bypass Control	Removed from Service
Steam Flow Control – Main Turbine Control	Removed from Service
Core Operating Limits Surveillance System (COLSS)	Removed from Service
Plant Monitoring System	Removed from Service
In-core Instrumentation System	Removed from Service
Ionization Chambers	Removed from Service
Essential Plant Parameter Monitoring System	Removed from Service
Tank Data Acquisition System	Removed from Service
Command Center Data Acquisition System (CDAS)	Available

## 7.2 INSTRUMENTATION SYSTEMS NOT REQUIRED FOR SAFETY

### 7.2.1 COMMAND CENTER DATA ACQUISITION SYSTEM (CDAS)

#### 7.2.1.1 Overview

The CDAS is a non-safety related, Quality Class III, Seismic Category II system. The CDAS is a digital based system that provides required indications and alarms. CDAS is a monitoring only system and has no control functions. CDAS utilizes the R-Time software platform.

#### 7.2.1.2 General Functional Conditions

##### 7.2.1.2.1 Users

The CDAS provides required indication and alarm information to Control Room/Command Center Operators. The Human Machine Interface (HMI) displays are located as follows:

- One at the Unit 2 Control Operator's Console 2CR-55
- One at the Unit 3 Control Operator's Console 3CR-55
- One at the Common Control Operator's Console 2/3CR-66

Annunciator functions are provided by speakers connected to each Personal Computer based workstation, which provide simultaneous annunciation. Acknowledgement, clearing or resetting of alarms can be done at each of the Operator workstations.

##### 7.2.1.2.2 Data Acquisition

The CDAS collects data from the following SSCs:

- ISFSI I North Industrial Area (NIA)
  - ISFSI Outlet Temperature monitoring
  - NIA Liquid Effluent Radiation Monitor 2/3RE2101
  - NIA Sump Level Monitoring
- Meteorological (MET)
  - Wind Speed and Direction
  - Temperature and Temperature Differential
  - Turbulence (Sigma)
  - Precipitation
- Unit 2 and 3 800 MHz Communication Rectifier
  - Overall System Health and Status
  - Radiation Monitors
    - Gaseous Effluent Monitor (Plant Vent Stack)
    - Total Vent Flow rate
    - Effluent radiation levels
  - Area Monitors; 2/3RE7851, 2(3)RE7850

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- Liquid Effluent Monitors; 2RE7821, 2/3RE7813
- U2 and U3 Spent Fuel Pool
  - High and Low Levels
  - High Temperature
- Firewater System
  - Pump Status: 2/3P220, P221, P222
  - Water Tank (TI02 and TI03) Level
  - Header Pressure
- U2 and U3 Salt Water Dilution Pumps
  - Pump Flow
- Chemical Waste Tank
  - Tank Level