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EXTERNAL REFERENCE

Meeting minutes

Nuclear safety I&C functions – SIC-1 I&C functions

Identify main Nuclear safety I&C functions and SIC-1 I&C functions.

Approval Process			
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Nuclear safety I&C functions – SIC-1 I&C functions
Held on 06/05/2010 at ITER -Cadarache

Abstract

Identify main Nuclear safety I&C functions and SIC-1 I&C functions.

		Date: 7/05/2010
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Records of Revision:

Revision	Date	Descriptions
1.0	7/05/2010	

Contents

1 AGENDA

- Identify main Nuclear safety I&C functions,
- Identify SIC-1 I&C functions.

2 Attendees

Ciattaglia Sergio - CIE/NSE/SDI

Fourneron Jean-Marc - CHD/CIT/CODAC

3 Minutes

List of the main Nuclear Safety I&C functions on ITER :

- Primary confinement :
  - Primary Confinement of VV (up to VVPSS) in case of overpressure
    - Opening of bleed lines,
    - Isolation of all VV circuits (diagnostic, IC, EC, LH, NBI, fuelling, vacuum…)
  - Primary Confinement of PHTS (VV, BLK, DIV, NBI) in case of LOCA
  - Primary Confinement of Tritium process lines in case of leak in the process lines (fuelling, tritium reprocessing lines)
  - Fire detection in rooms with high Tritium inventory

- Secondary confinement
  - Detection of Tritium in rooms and actuation of the Detritiation System
  - Dynamic confinement of Radwaste building : HVAC

- Avoid initial events :
  - Detect magnet quench and discharge the energy
  - Detect loss of power supply and start emergency power plant
  - Manage the pressure, flow, level in pressurizer and temperature in the PHTS and in some case actuate mitigation/protection systems :
    - Plasma shutdown,
    - Isolation of circuits
  - Monitor the windows temperature and actuate shutdown of relevant Heating systems, in some cases plasma shutdown
  - Control of Air Leak inside the VV : actuation of the isolation valves and shutdown of the system

- Monitor of all safety functions, in order to inhibit experiment or go to safe state in case of failure of some nuclear safety function.

List of all SIC-1 I&C functions :

- When the VV pressure (sensor in PBS.31) reach 0.9 bar, open the bleed lines to VVPSS, and close critical valves for isolation of the VV to isolate. The list of isolation valves that ensure this confinement of the first barrier has to be identified (Vacuum system, CWS, fuelling, additional heating, diagnostic…)

- Primary Confinement of process lines of Tritium (flow, pressure) in case of leak in the process lines (fuelling, tritium reprocessing lines)

- When Tritium is detected in a room, then isolation of the ingress HVAC dampers and actuation of the Detritiation system (logic to be precised about ingress/exhaust/dampers/ different or same circuits for Detritiation and HVAC). This concerns tritium building, some areas of tokamak (galeries, port cell, NBI cells…), (hotcell ?)
- Fire detection and actuation of detritiation systems in High Tritium inventory area (tritium building, Hotcell ?)
- Detection of loss of power and start the Emergency power plant (Diesel generators)
- Monitoring of radioactive release at the Chimney

Function that is not yet SIC-1 I&C function but that may become one :

- *Helium circuit 4.5 K valves located in port cell have to close in case of loss of pressure/flows… of helium in the circuit.*

List of buildings that may host SIC-1 I&C functions:

- 11 Tokamak building,
- 14 tritium building,
- 74 Diagnostic building,
- 44 Emergency power supply (train A) building,
- 45 Emergency power supply (train B) building,
- 21 Hot Cell building,
- 71 Control building,
- 24 Personnel access control building.

4 Actions

SDI will provide the list od :

- Areas concerned by detritiation systems,
- Areas concerned by SIC-1 fire detection.

Identify the list of valves ensuring the SIC-1 isolation of the Vacuum Vessel : meetings SDI/CODAC/Plant Systems.