

UK EPR	Title: PCSR – Sub-chapter 8.5 – Installation	
	UKEPR-0002-085 Issue 04	
	Total number of pages: 5	Page No.: I / III
Chapter Pilot: E. PILOQUET		
Name/Initials <i>ER Loquet</i> Date 20-08-2012		
Approved for EDF by: A. MARECHAL	Approved for AREVA by: G. CRAIG	
Name/Initials <i>A. J. Marelhal</i> Date 21-08-2012	Name/Initials <i>G. Craig</i> Date 20-08-2012	

REVISION HISTORY

Issue	Description	Date
00	First issue for INSA information.	11/12/2007
01	Integration of technical and co-applicant review comments	28/04/2008
02	PCSR June 2009 update: – Clarification of electrical equipment rooms.	27/06/2009
03	Consolidated Step 4 PCSR update: - Minor editorial changes - Sections 1.1 and 2, clarification of text regarding physical separation of equipment in separate fire zones	29/03/2011
04	Consolidated PCSR update: - Minor editorial changes - Clarification of text (sections 1.1, 1.2, 1.3 and 2) - Section 2, level of battery rooms in non-classified electrical buildings changed from +5.50 m to -5.70 m.	21/08/2012

UK EPR		
	Title: PCSR – Sub-chapter 8.5 – Installation	
	UKEPR-0002-085 Issue 04	Page No.: II / III

Copyright © 2012

**AREVA NP & EDF
All Rights Reserved**

This document has been prepared by or on behalf of AREVA NP and EDF SA in connection with their request for generic design assessment of the EPR™ design by the UK nuclear regulatory authorities. This document is the property of AREVA NP and EDF SA.

Although due care has been taken in compiling the content of this document, neither AREVA NP, EDF SA nor any of their respective affiliates accept any reliability in respect to any errors, omissions or inaccuracies contained or referred to in it.

All intellectual property rights in the content of this document are owned by AREVA NP, EDF SA, their respective affiliates and their respective licensors. You are permitted to download and print content from this document solely for your own internal purposes and/or personal use. The document content must not be copied or reproduced, used or otherwise dealt with for any other reason. You are not entitled to modify or redistribute the content of this document without the express written permission of AREVA NP and EDF SA. This document and any copies that have been made of it must be returned to AREVA NP or EDF SA on their request.

Trade marks, logos and brand names used in this document are owned by AREVA NP, EDF SA, their respective affiliates or other licensors. No rights are granted to use any of them without the prior written permission of the owner.

Trade Mark

EPR™ is an AREVA Trade Mark.

For information address:



AREVA NP SAS
Tour AREVA
92084 Paris La Défense Cedex
France



EDF
Division Ingénierie Nucléaire
Centre National d'Équipement Nucléaire
165-173, avenue Pierre Brossolette
BP900
92542 Montrouge
France

UK EPR		
	Title: PCSR – Sub-chapter 8.5 – Installation	
	UKEPR-0002-085 Issue 04	Page No.: III / III

TABLE OF CONTENTS

1. DESCRIPTION OF INSTALLATION
 - 1.1. GENERAL
 - 1.2. ELECTRICAL EQUIPMENT ROOMS
 - 1.3. BATTERY ROOMS
 - 1.4. CABLE TRAYS
 - 1.5. INSTALLATION OF INSTRUMENTATION AND CONTROL EQUIPMENT
2. LOCATION OF ELECTRICAL EQUIPMENT

SUB-CHAPTER 8.5 – INSTALLATION

1. DESCRIPTION OF INSTALLATION

This sub-chapter summarises the main features of the civil installations in the Nuclear Island, Conventional Island and the Balance of Plant where the electrical distribution and instrumentation and control systems are installed, thereby contributing to the safety functions they perform and their availability requirements.

1.1. GENERAL

Each emergency power supply train is installed in a separate division. The separation into divisions ensures that, in the event of an internal hazard within a division, only the division in question is affected.

The Diesel Generator Buildings are geographically separated so that an aircraft crash can only make two emergency diesel generators and one ultimate diesel generator unavailable. The layout enables functional separation between the normal and emergency power supply systems.

Physical separation of the normal and emergency power supply is not necessary. Separation between the medium and low voltage equipment and DC voltage equipment is also not required.

In divisions 1 and 4 of the Nuclear Island, electrical switchboards fed by Emergency Diesel Generators and electrical switchboards fed by Ultimate Diesel Generators (also referred to as Station Black Out (SBO) diesel generators within the PCSR) are installed in different fire zones.

Most of the Nuclear Island electrical equipment is installed in the electrical buildings. Some decentralised equipment such as the local sub-distribution systems, are installed in other rooms.

Conventional Island and Balance of Plant electrical equipment is installed in the non-classified electrical buildings. This equipment is installed in two physically separated non-classified electrical buildings (one for trains 1 and 3, and one for trains 2 and 4), located in separate fire zones.

1.2. ELECTRICAL EQUIPMENT ROOMS

The electrical equipment rooms are designed in accordance with the current codes. For example, the walls, floors and ceilings are maintained free from dust, the rooms contain no mechanical equipment, and access is limited to authorised personnel only.

The civil structures are required to resist hazards.

The battery chargers are installed as close as possible to the batteries to minimise the length of the connection cables, thereby minimising risk of short-circuits. Connections between batteries and distribution switchboards with direct current are realised by cables separated by polarity. Negative and positive polarity cables are routed separately, at a minimum distance of 300 mm.

The local environmental conditions are as described in Chapter 9.

1.3. BATTERY ROOMS

The battery rooms are designed in accordance with the current codes.

The batteries are located in dedicated rooms, which have an acid-resistant floor and a separate fan for hydrogen extraction (see Sub-chapter 9.4).

1.4. CABLE TRAYS

For the description of cableways and the installation of cables, see Sub-chapter 8.4.

1.5. INSTALLATION OF INSTRUMENTATION AND CONTROL EQUIPMENT

For the installation of instrumentation and control equipment, see Chapter 7.

2. LOCATION OF ELECTRICAL EQUIPMENT

Electrical systems in conventional and nuclear islands are installed in different buildings; the first ones in the conventional island's non-classified electrical building and the others in the Safeguard Auxiliary Buildings, in dedicated rooms.

This location enables reduction of the connecting distances between actuators of safety systems located in lower levels of the Safeguard Auxiliary Buildings and the Reactor Building via electrical penetrations. In the same way, the short distance between the conventional island's non-classified electrical building and the Turbine Hall allows to reduce distances between actuators in the conventional island.

A room for 10 kV and 400 V AC non-classified electrical switchboards is dedicated to each division of the pumping station.

Emergency Diesel Generators are installed in two physically separated buildings (divisions 1 and 2 in one side and divisions 3 and 4 in the other side).

Ultimate Diesel Generators are installed in each building (one in each group of two divisions).

Classified and non-classified electrical switchboards are installed in the same rooms. Rooms for I&C cabinets are different from rooms for electrical switchboards.

In divisions 2 and 3, batteries are installed in dedicated rooms at level +12 m.

In divisions 1 and 4, batteries are installed in dedicated rooms at levels +4.70 m and +8.10 m.

12-hour capacity batteries provided in the event of serious accident are located in dedicated rooms at level -3.78 m in the Diesel Buildings.

In the non-classified electrical buildings, the batteries are located in dedicated rooms at -5.70 m.

For fire protection structural statements, see Sub-chapter 13.2 section 7.2.