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SUB-CHAPTER 6.4 – HABITABILITY OF THE CONTROL ROOM

0. SAFETY REQUIREMENTS

0.1. SAFETY FUNCTIONS

The "habitability function" must ensure the habitability of the main control room during all types of events that might result in radioactive contamination of the environment.

0.2. FUNCTIONAL CRITERIA

The term "Habitability Function" refers to the equipment, supplies and procedures necessary to enable the operators to remain in the main control room and take actions required to operate the plant safely in normal conditions, and to maintain it in a safe condition following an accident.

Acceptable ambient conditions are ensured by the DCL [CRACS] ventilation system (section 8 of Sub-chapter 9.4).

0.3. REQUIREMENTS RELATING TO THE DESIGN

0.3.1. Requirements from Safety classifications

- Functional classification: the DCL [CRACS] must be safety classified in accordance with the principles in Sub-chapter 3.2.
- Single failure criterion (active and passive): those parts of the DCL [CRACS] that perform F1 functions must be designed to satisfy the single failure criterion.
- Emergency power supplies: the active F1 components of the four trains of DCL [CRACS] must be powered by emergency switchboards supplied via the main diesel generator sets (also referred to as 'emergency diesel generator' sets within the PCSR).
- Following a station blackout, the air conditioning systems must be backed up by the SBO diesel generator sets.
- Qualification for anticipated operating conditions: the DCL [CRACS] equipment must be qualified to meet its safety role in the environmental conditions to which it is subjected when carrying out its function.
- Mechanical, electrical and I&C classification: these classifications are given in Sub-chapter 3.2.
- Periodic tests: systems performing F1 and F2 functions must be subjected to periodic tests.

0.3.2. Hazards

The habitability function is ensured in the event of internal and external hazards. The corresponding systems are designed in accordance with the hazards protection methodology presented in Chapter 13.

1. DESIGN BASIS

Habitability systems are designed to:

- Withstand external hazards,
- Meet operator personal needs (kitchen including water and food storage, medical facilities, washroom facilities),
- Provide adequate protection against radiation to allow access to, and occupation of, the main control room during accidents. It must be ensured that over the entire duration of an accident, staff are not subjected to radiation doses to the entire body or to part of the body beyond the limits specified in ICPR60 [Ref-1] or in European Regulation EURATOM 96/29 [Ref-2].
- Provide protection against toxic or harmful gases (self-contained breathing apparatus is provided),
- Provide appropriate protection against the effects of fires,
- Protect the emergency control and I&C equipment (i.e. systems and equipment that are important for safety and are required to perform necessary safety functions during accidents and emergencies).

2. SYSTEM DESIGN

2.1. DEFINITION OF THE ISOLATION AREA

The isolation area consists of the main control room, the emergency technical room, offices, the kitchen, washroom facilities, corridors and computer rooms.

2.2. VENTILATION SYSTEM DESIGN

The main control room and annexe rooms are heated and air-conditioned by the DCL [CRACS] (section 8 of Sub-chapter 9.4).

If the environment is contaminated after an accident either on or close to the site, the DCL [CRACS] ensures suitable filtering of the fresh air.

2.3. LEAK-TIGHTNESS

A slight overpressure is maintained in the isolation area to prevent non-filtered air from entering via leaks (doors, cable and pipe penetrations). Specific construction provisions are made for the access doors, as well as pipe penetration sleeves, pipes and electric cables.

Each non-filtered air inlet is equipped with a leak tight power-operated damper with automatic closing.

Also, construction provisions and a suitable concrete surface treatment are provided to reduce leaks due to construction joints and concrete porosity.

2.4. INTERACTION WITH OTHER AREAS

The DCL [CRACS] supplies no other areas with air.

There are other air conditioning systems in the engineered safeguard buildings, but they do not serve the main control room.

2.5. SHIELDING DESIGN

The isolation area design includes shielding that maintains acceptable radiation levels in the main control room during an accident.

Staff exposure is limited according to the regulations specified in section 1 of this sub-chapter, over the full duration of any accident considered in the design basis.

3. SYSTEM OPERATION

The normal DCL [CRACS] for the main control room operates continuously. Two out of the four 50% capacity air conditioning systems are required to be in service (section 8 of Sub-chapter 9.4).

SUB-CHAPTER 6.4 – REFERENCES

External references are identified within this sub-chapter by the text [Ref-1], [Ref-2], etc at the appropriate point within the sub-chapter. These references are listed here under the heading of the section or sub-section in which they are quoted.

1. DESIGN BASIS

[Ref-1] 1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60. Ann. ICRP 21 (1-3). 1991. (E)

[Ref-2] Council directive 96/29/EURATOM of May 1996.laying down basic safety standards for the protection of health of workers and general public against the dangers arising from ionising radiation. EURATOM 96/29. May 1996. (E)