

Safety-Related Cabling system for Gen 3+ Reactors: LOCA and Severe Accident-Proofness

Introduction

As a reaction to the Fukushima disaster, authorities implemented a number of improvements in nuclear power plants (NPP) in order to improve safety.

Some of them are related to the survivability of safety-related sensors located in the containment.

In the event of an accident, the conveyance of a signal from safety-related sensors to the containment wall penetration is key.

Thermocoax is developing specific **cabling systems** for degraded harsh environments with an NPP design.

The challenge: to design a robust **cabling system** capable of enduring abnormal or even accident conditions over a lifespan equivalent to the NPP lifespan (i.e., 60 years).

The requirement: Signal transmission lines need to resist normal and abnormal conditions during their entire plant lifespan.

The design of the **cabling systems** takes into consideration adverse conditions, such as loss of coolant accident (LOCA) and/or severe accident (core melt accident, hydrogen burning), radiation, pressure and seismic conditions and are subject to a stringent test programme following national or international standard requirements (such as IEEE-383 and recommendations) overseen by various authorities.

Once all tests have been successfully passed and the 1E/K1 qualification has been obtained, a stringent manufacturing programme ensures product repeatability and traceability.



The benefits of Thermocoax technology

THERMOCOAX develops cabling systems based on various technologies, including Mineral Insulated cable technology. No thermal and radiation ageing of the material associated with a specific assembly and manufacturing process results in an extra-long lifespan.

From a technical standpoint, our MI cable technology offers the ultimate performance in terms of withstanding pressure, radiation and temperature compared with other technologies.

No replacement during the lifespan of the NPP is required, resulting in a low cost of ownership; intervention in a contaminated area being a much higher cost factor than the product cost.

THERMOCOAX and nuclear SOLUTIONS

THERMOCOAX Nuclear specialises in In-Core and Ex-Core SOLUTIONS, such as:

- Sensors (neutron flux & gamma flux, temperature measurement and level & flow measurement)
- **Cabling systems**
- Heating solutions