



Core Catcher cooling structures

A core catcher is used to catch and permanently cool the molten material before it can reach the foundation.



Siempelkamp

NIS Ingenieurgesellschaft

The Core Catcher is an essential part of the "Core Melt Stabilization System" in the EPR™ reactor and complements the primary safety systems of the EPR™ reactor, whose job is the reliable prevention, avoidance and control of nuclear accidents.

In the event that all these systems fail completely and a core meltdown occurs in the reactor, the core catcher serves to catch and - on a passive basis - permanently cool the molten material before it can reach the foundation. This maintains the integrity of the containment and limits the immediate consequences of the accident to the interior of the plant.

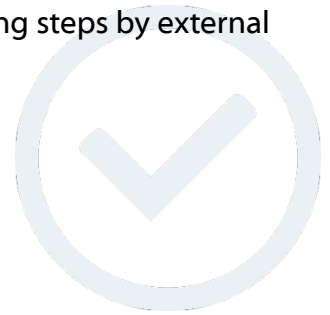
The core catcher is a complex structure consisting of a number of individual cooling elements made of spheroidal cast iron and a steel structure connecting the cooling elements. Cooling fins are integrated into the cast elements and form the channel system for the cooling water. The steel structure serves to fix and ensure the required arrangement of the cooling elements.

Prior to the construction of the core catcher, numerous investigations and tests were carried out at international level regarding the controllability of a core meltdown in the reactor. Within the framework of the COMAS project (Cori-um on Material Surfaces), Siempelkamp investigated, among other things, the propagation behaviour of prototypical core melts. In a large-scale test, in which the representative spreading surface in the EPR™ reactor was reproduced on a scale of 1:6, the technical feasibility of the concept was successfully demonstrated.



Equipment

- Concept, design and licensing planning
- Basic and detail engineering including 3D planning
- Construction and manufacturing planning
- Licensing support, i.e. support of external reviewers and authorities
- Quality-assured manufacturing including material procurement in accordance with the nuclear rules and regulations
- Manufacturing of all individual components including all testing steps by external reviewers, authorities and customers
- Delivery and assembly
- Commissioning and staff training
- Quality assurance and final documentation



References

- Core Catcher incl. installation for the Olkiluoto 3 nuclear power plant, Finland
- Core Catcher incl. installation for the Flamanville 3 nuclear power plant, France
- Core Catcher for the Taishan 1&2 nuclear power plant, China
- Core Catcher for Hinkley Point C nuclear power plant, UK (currently in progress)



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