framatome

PASSIVE CATALYTIC IGNITER – CATI 1.0

Limitation of Combustion Loads on the Containment

Framatome's Passive Catalytic Igniter improve the plant safety by deliberate ignition of combustible gases in the containment atmosphere during severe accidents without the need for external power supply.

Challenge

In severe accidents, metal-water reactions and concrete-corium interactions lead to the generation of large quantities of combustible gases, mainly hydrogen and carbon monoxide, inside the containment. This involves the rapid local formation of flammable gas mixtures. If ignited, these gas mixtures can release a significant amount of energy. If subsequent ignitions occur at high hydrogen concentrations, the containment may be subjected to loads large enough to compromise its integrity.

Solution

Framatome's Passive Catalytic Igniter (CATI 1.0) can limit the hydrogen concentration to levels well below the detonation limit. Initiating combustion already when small amounts of ignitable gas mixtures have formed, and early intentional ignition provide a significant safety benefits as the resulting loads are distributed in time and space and do not pose a threat to the integrity of the containment.

Framatome's Passive Catalytic Igniter (CATI 1.0) combines the following advantages:

- Initiation of the combustion by using the same proven catalyst technology as in the Framatome PAR, which is installed in more than 150 nuclear power plants worldwide.
- Self-activation at the onset of the accident, initiating combustion when the hydrogen concentration just exceeds the ignition limit of the gas mixture.
- Ignitions are localized and staggered in time so that loads do not challenge the containment.
- No external power supply is needed, so no containment penetrations are required.

Customer benefits

- Reliable operation
- Qualified for severe accidents
- No external power supply is required
- Easy installation
- Low maintenance effort

Your performance
is **our** everyday **commitment**

CATI 1.0 front view (left) and bottom view (right)

Technical information

Dimensions:	
– Diameter approx.:	120 mm
– Height:	280 mm
Weight:	<5 kg
Lower ignition limit:	6.8 vol.-% H_2

Qualification

- Resistance to thermal aging
- Tests of ignitable hydrogen concentrations at various water vapor concentrations
- Operation in the presence of atmospheric impurities generated after an accident (e.g. iodine, smoke from oil fires, aerosols)
- Seismic resistance

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