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The ARCHEOS heat unit to decarbonize the heat market with proven technologies

The ARCHEOS SMR is under development in the CEA. Currently under conceptual design phase, the ARCHEOS objective is to decarbonize the heat market in Europe for low temperature applications such as food industry, pulp and paper and chemistry. In 2024, a new structure regrouping industrial partners will host the ARCHEOS development.
ARCHEOS is a Light-Water Reactor powering 50MW of heat to industrial networks. The main compromise on the ARCHEOS design, allowing reaching the economic target, is the supply temperature around 150°C. The reactor operates below 15 bar and uses new inherent safety feature.
The thermalhydraulic design use natural convection on the primary and secondary circuits for normal operation. The primary circuit is an integrated vessel connected to compact heat exchangers directly linked to the vessel. A second vessel containing the secondary volume is around the primary vessel and contains a hot zone and a cold zone separated by a thermocline. The secondary circuit is thus in natural convection between the primary/secondary heat exchanges and the thermocline.
This particular design leads to new thermalhydraulic operation of the reactor and a very high degree of safety: various accidents studied for LWRs do not exist for ARCHEOS and a thermal inertia will absorb the vast majority of postulated accident for ARCHEOS.

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Confirm that the work is original and has not been published anywhere else

YES

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