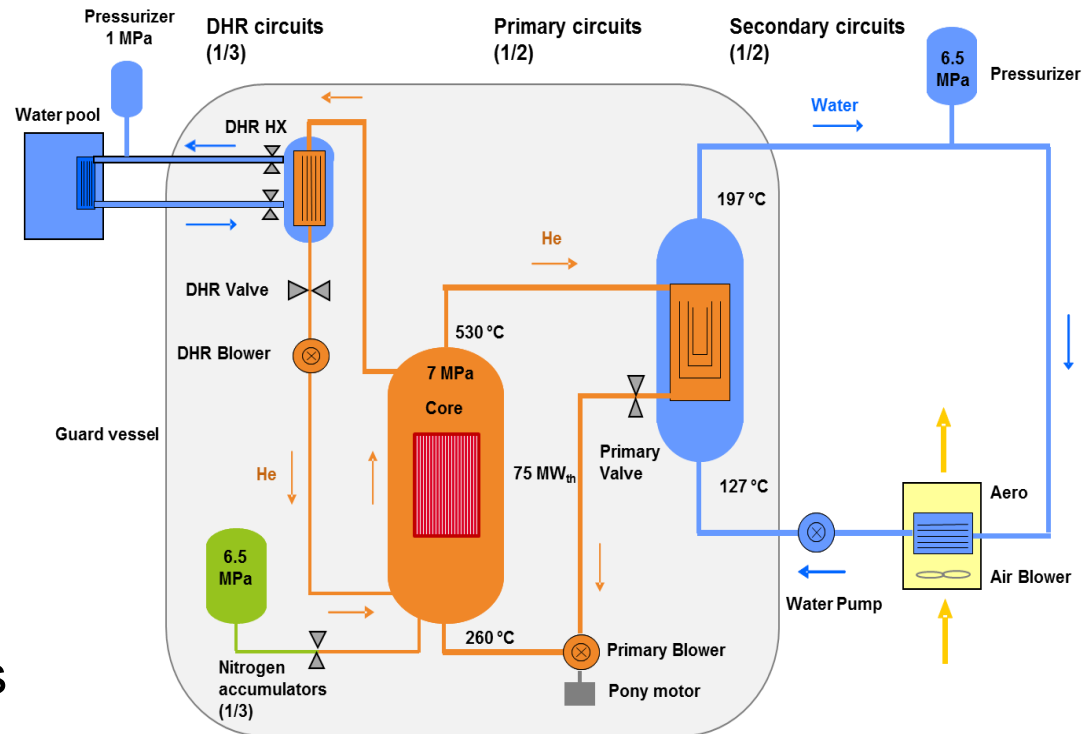


Slavomir BEBJAK - Boris KVIKZDA - Gusztav MAYER - Petr VACHA

Decay Heat Removal studies in Gas Cooled Fast Reactor during accidental condition - demonstrator ALLEGRO

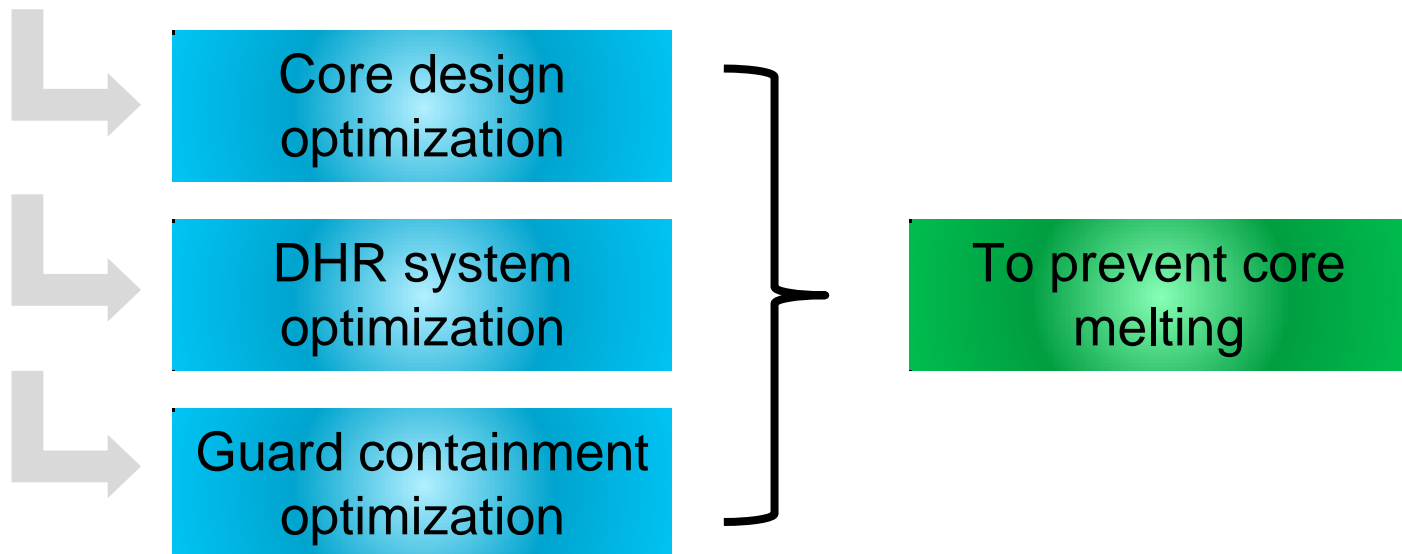
What the ALLEGRO is (reference design):

- 75 MW_{th} nominal power
- 260°C core inlet
- 530°C core outlet
- 7 MPa primary pressure
- 2 helium primary loops
- 2 water secondary loops
- 3 DHR loops

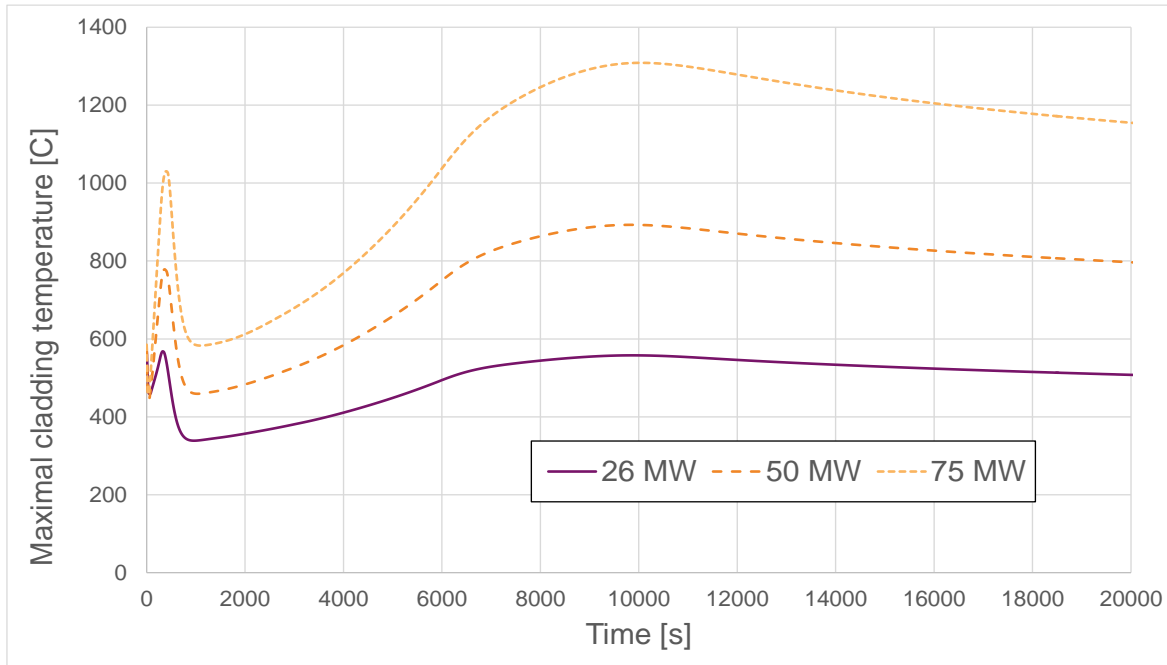


Challenges of DHR studies and improvements

- are related to the use of gas coolant:
 - low thermal inertia of helium
 - low gas-coolant density
 - high core power density



Initiating event: LOCA + Station Blackout



CATHARE
calculation

1 inch LOCA

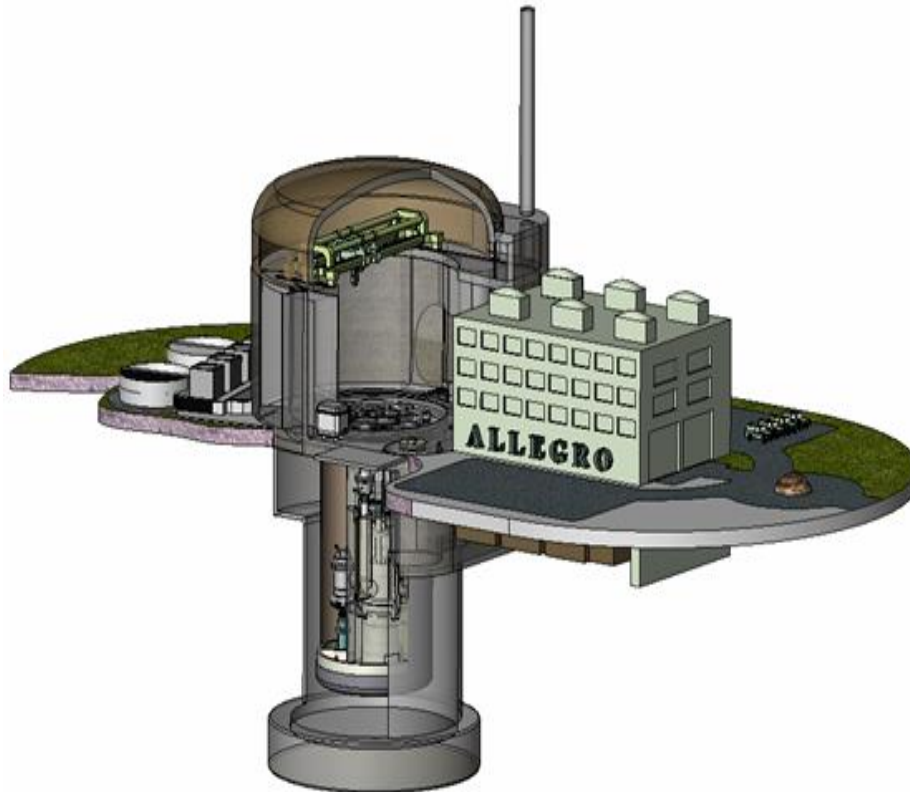
	75 MW		37.5 MW	
Guard vessel backup pressure	0.4 MPa	1.1 MPa	0.4 MPa	1.1 MPa
Maximum cladding temperature	Melting	Melting	Melting	1124 °C

MELCOR
calculation

10 inch LOCA

CONCLUSION

- ALLEGRO design is being improved to increase the decay heat removal capabilities in case of a very unlikely transient of LOCA cumulated with a Total Station Blackout



**Thank you
for your attention**

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