

A S T R I D

*Advanced Sodium Technological Reactor
for Industrial Demonstration*



DE LA RECHERCHE À L'INDUSTRIE

cea den

SFR R&D NEEDS

TOPIC 2

Thermal-hydraulics Reactor System

JC Garnier (CEA)

www.cea.fr

DEN/CAD/DER/CPA

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1- DHR through the main vessel & security vessel (RRC SYSTEM)

- Modeling, sensibility analysis and scale effects
- Design a test facility and experiments
- Validation of RRC model and operational performances

2- Measurement of the S/A decay heat before its transfer in gas route

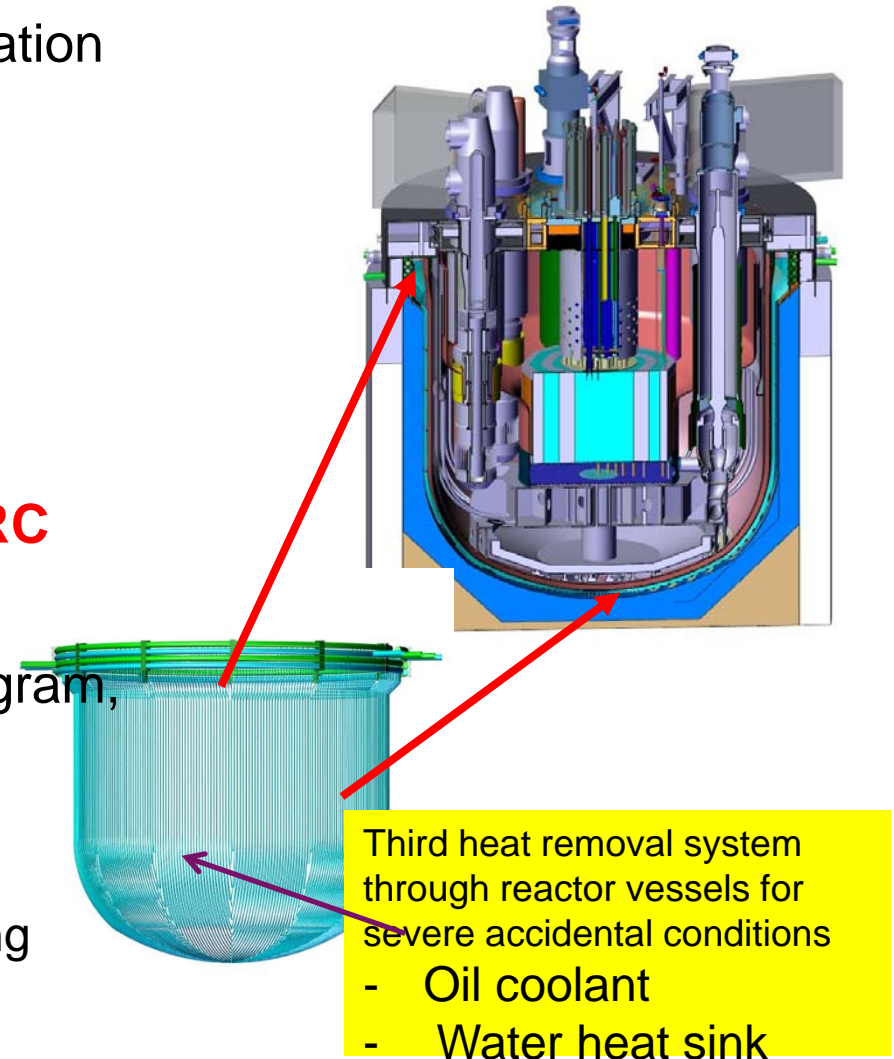
- Proposal of concept, preliminary feasibility
- Detailed study, technological development
- Prototype realization

RRC SYSTEM = DHR function in mitigation situations

Tasks to be performed in the next years :

- Simulation, sensibility analysis, contribution to the RRC qualification program
- Analysis of scale effect, test facility specification for **validation of the RRC operational performances**
- Test facility construction and test program,
- Experimental data base and model assessment (uncertainties)

Nota : CEA program underway for measuring the emissivity of the wall (depending of the surface, surface coating ...)



Gas handling route = ASTRID réf. option
->limitation of the SA max. decay heat power
(< 3 kW)

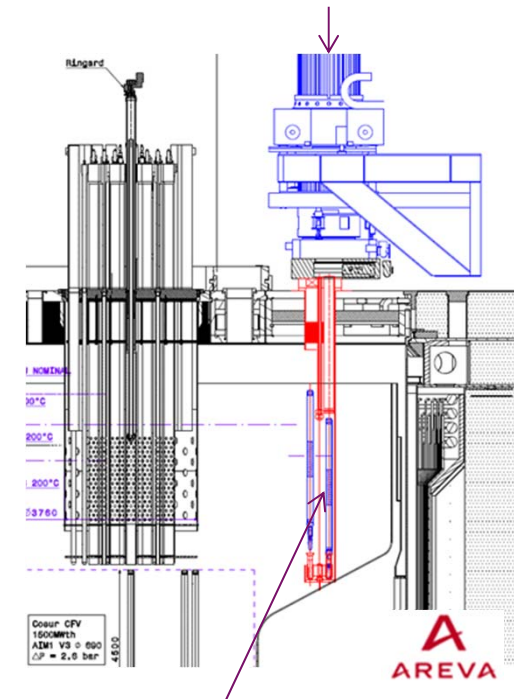
->need to measure and controle this value
before irradiated SA transfer from the reactor
vessel to the washing pit

- A principle of solution is defined (patented by CEA) - Alternative solutions are possible
->proposal of new ideas/concepts + preliminary feasibility

- After selection of the concept, detailed study will to be done (requirements, operational performances, technological solutions...)

- In the basic design phase, realization of a prototype for validation of the concept

Gas cask with active cooling



Rotor + residual power measurement

Commissariat à l'énergie atomique et aux énergies alternatives
Centre de Cadarache
DEN/CAD/DER/CPA – 13108 Saint Paul lez Durance cedex
Tél. : 04 42 25 25 62 – Fax : 04.42.25. 26,13– astrid@cea.fr
Établissement public à caractère industriel et commercial - RCS Paris B
775 685 01

Direction de l'énergie nucléaire

Département d'études des
réacteurs

Cellule Projet ASTRID