Profile SFR-12

NAIMMO

FRANCE

GENERAL INFORMATION

NAME OF THE FACILITY	NAIMMO
ACRONYM	NAIMMO
COOLANT(S) OF THE FACILITY	Sodium
LOCATION (address):	CEA Cadarache, 13108 Saint Paul Lez Durance FRANCE
OPERATOR	CEA
CONTACT PERSON (name, address, institute, function, telephone, email):	O. GASTALDI CEA Cadarache Building 710, 13108 Saint Paul Lez Durance, FRANCE Sodium Technology and Components Project Manager +33 4 42 25 37 87 Olivier.gastaldi@cea.fr
STATUS OF THE FACILITY	Under Design
Start of operation (date):	2019

MAIN RESEARCH FIELD(S)

- ☐ Zero power facility for V&V and licensing purposes
- ☐ Design Basis Accidents (DBA) and Design Extended Conditions (DEC)
- ☒ Thermal-hydraulics
- ☐ Coolant chemistry
- ☐ Materials
- ☒ Systems and components
- ☒ Instrumentation & ISI&R

TECHNICAL DESCRIPTION

Description of the facility

This test section is one of the three test sections of the CHEOPS facility (NAIMMO, NADYNE, NSET). The CHEOPS facility is under design and will be able to realise experiments from the first half of 2019. CHEOPS is devoted to the development of the

ASTRID innovative components and completes efficiently the PAPIRUS facility, due to the large scale components which could be tested. CHEOPS includes its own cleaning facility which is called STALACMITES.
The NAIMMO test section is a large tank which will permit to develop components with large scale (full scale for some parts of components) in similar conditions than those of the ASTRID reactor (except neutron flux).
This test section is mutualised with the NADYNE test section, so both test sections have the same storage tank, purification system, pump, heater and cooler (all the sodium technology "standard"). So CHEOPS facility includes two sodium loops : the NAIMMO / NADYNE loop and the NSET loop.

Acceptance of radioactive material
No

Scheme/diagram

3D drawing/photo

FIG. 1. Overall view of CHEOPS Facility

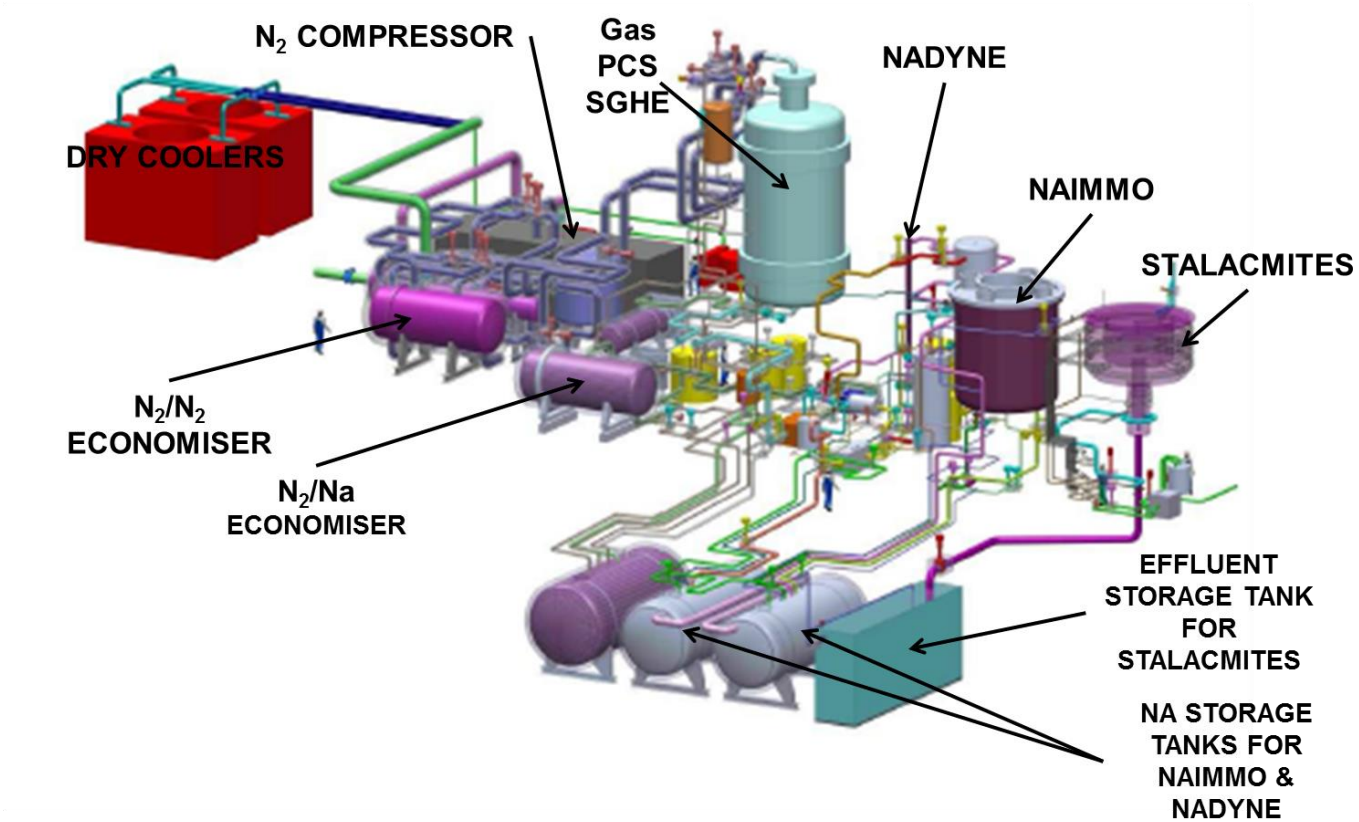

FIG. 2. Overall scheme of CHEOPS processes

Parameters table

Coolant inventory	Sodium inventory : 70 tonnes
Power	300 kW
Test sections	
TS #1	*Characteristic dimensions* Diameter : 4400 mm Height : 4000 mm
	Static/dynamic experiment Static and dynamic experiments
	Temperature range in the test section (Delta T) Until 580°C
	Operating pressure and design pressure **Operating pressure : 5 bars**

	Flow range (mass, velocity, etc.) 200 m3/h
Coolant chemistry measurement and control (active or not, measured parameters)	Active coolant quality measurement and control (purification with a cold trap on a by passed flow: 10 m^3/h and impurities level < few ppm, and impurities content evaluation by a plugging indicator)
Instrumentation	Thermocouples Argon pressure measurement Inductive level probes Sodium flowmeters Sodium pressure sensor

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

N.A.

PLANNED EXPERIMENTS (including time schedule)

The time schedule is not yet established in detail. So, only the planned experiments will be listed hereafter:

- Development of sealing using metallic joints with large diameter (for IHX)
- Thermal-hydraulic of sodium vapour in argon in order to improve the heat transfer law between sodium free surface and reactor slab
- Development of instrumentation for In Service Inspection & Repair (ISI&R)
- Development of articulated arm for ISI&R
- Development of some parts of the fuel handling system
- Development of some parts of the control rod mechanisms

A period of 5 years is planned to realize these experiments.

TRAINING ACTIVITIES

REFERENCES (*specification of availability and language*)

1. GASTLADI O. and al. Experimental platforms in support of the ASTRID program: existing and planned facilities at CEA, ICAPP 2015 NICE, FRANCE, MAY, 3-6, 2015 – Paper 15126