

Profile LFR-75

LECHEM

CHINA

GENERAL INFORMATION

NAME OF THE FACILITY	Lead-bismuth Eutectic CHEMistry experimental facility
ACRONYM	LECHEM
MEDIUM (COOLANT(S)) OF THE FACILITY	LBE
LOCATION (address):	CNPRI, Shenzhen city, China
OPERATOR	CNPRI
CONTACT PERSON(S) (name, address, institute, function, telephone, email):	Jiming Lin China Nuclear Power Technology Research Institute (CNPRI) 0086-755-88617716 linjiming@cgnpc.com.cn

STATUS OF THE FACILITY	In operation
Start of operation (date):	2017

MAIN RESEARCH FIELD(S)	<input type="checkbox"/> Zero power facility for V&V and licensing purposes
	<input type="checkbox"/> Design Basis Accidents (DBA) and Design Extended Conditions (DEC)
	<input type="checkbox"/> Thermal-hydraulics
	<input checked="" type="checkbox"/> Coolant chemistry
	<input type="checkbox"/> Materials
	<input type="checkbox"/> Systems and components
	<input type="checkbox"/> Instrumentation & ISI&R

TECHNICAL DESCRIPTION

Description of the facility

The main purposes of the LECHEM loop are: a) to develop oxygen control systems for regulating dissolved oxygen in liquid lead-bismuth eutectic (LBE); b) to evaluate filtration systems for purifying the LBE; c) to validate erosion of pump impeller materials; d) to evaluate measurement performance of oxygen sensors.

The LBE circulates inside a closed loop made of stainless steel. The main components of the loop are an induction pump, a heater, oxygen sensors, a MX exchanger, a filtration system, a gas control system, an expansion tank and a storage tank. The loop is designed to operate at a pressure of up to 5 bars and a maximum flow rate of 3.5 m³/h. Typical dimensions of the pipes are about 24mm. In the latter the mean LBE velocity is up to 2.15 m/s. The volume of the loop is about 20 l. With LBE, the operating temperature is 150-500°C.

Acceptance of radioactive material

No

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Scheme/diagram

3D drawing/photo



Parameters table

Medium (Coolant) inventory	LBE 200Kg
Power	18KW
Test sections	
TS #1	<u>Characteristic dimensions</u> Pipe dimensions 24mm
	<u>Static/dynamic experiment</u> Loop experiment
	<u>Temperature range in the test section (ΔT)</u> 150°C-500°C (350°C)
	<u>Operating pressure and design pressure</u> 5 bars
	<u>Flow range (mass, velocity, etc.)</u> maximum flow rate of 3.5 m ³ /h
Medium (Coolant)	Active oxygen control and monitoring

chemistry measurement and control (active or not, measured parameters)	
Instrumentation	Oxygen sensor, differential pressure gage, flow meter

COMPLETED EXPERIMENTAL CAMPAIGNS: MAIN RESULTS AND ACHIEVEMENTS

Phase one of gas and solid oxygen control

PLANNED EXPERIMENTS (including time schedule)

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TRAINING ACTIVITIES

Training activities are possible, depending on availability and after prior agreement under supervision of CNPRI.

REFERENCES (*specification of availability and language*)

No