IAEA Data Base and Portals on Advanced Reactors
Research Infrastructures and Experimental Facilities

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Experimental Facilities in Support of Liquid Metal cooled Fast Neutron Systems

Freely Accessible:
https://nucleus.iaea.org/sites/lmfns
or google “IAEA LMFNS”

includes data on 150 experimental facilities under design, construction or operation
**LMFNS Experimental Facilities Database**

Experimental Facilities in support of Development and Deployment of Liquid Metal cooled Fast Neutron Systems

- A comprehensive Catalogue providing detailed information on experimental facilities currently designed, under construction or operating
- Facilities Designed to support the development and deployment of innovative liquid metal-cooled (sodium, lead and lead-bismuth) fast neutron systems (LMFNS), both critical and subcritical
- Identifies existing or future operational experimental facilities able to support innovative LMFNS
- Expected to facilitate cooperation using existing and planned experimental facilities for LMFNS, and enhance their utilization by providing end-users with detailed information
- Encourages international collaborations

**Overview**

Includes an overview as well as detailed information on 150 experimental facilities under design, construction or operation (in 2016)

19 institutions from 14 IAEA Member States contributed

**Freely Available at iaea.org:** Search for “IAEA LMFNS”
IAEA NES Publication: Experimental Facilities in Support of Liquid Metal Cooled Fast Neutron Systems

• Inputs received from 14 countries and EU
• 151 facilities reviewed and accepted:
  – Na-based facilities: 79
  – Pb-based facilities: 72
• NES document – 50 pages overview and ~1000 pages on CD
  - printed in 2018
  - online since 2016

6B: IPPE, Russia
Search Online Catalogue of LMFNS Facilities

nucleus.iaea.org/sites/lmfns
Update of the Online Catalogue of LMFNS Facilities CM on 29-31 January 2019

- **13** Experts from **10** countries, EC, and GIF R&D Task Force on Research Infrastructures
- **Added 38 New Facilities**
- **Updated Profiles for 41 Facilities**
- **Updated version will go online in June 2019**

**LETEA**: Lead-bismuth Eutectic Thermal-hydraulic Experiment Facility by CNPRI (China Nuclear Power Technology Research Institute)
Update of the Online Catalogue of LMFNS Facilities

**SFR: New 22, Update 7**

China: CIAE, COSPOT

France: NEW

ARTOIS, BANCA, DICO-2, FAENA, FONTANA, FRCTIDOR, HERMES-T, KALINA, MECI/COTHAA, MICAS, MININANET, NADYNE, NBB, NECRINA, N-ESMERALDA, N-GRIGNOTIN, N-TRIPO, N-SET, NIAMMO, PLINIUS-FOURNAISE 1, STALACMITES, TRANSCONTA, VAUTOUR, VERDON, VISO;

JANNUS, LECI, TAMARIS

Germany: Update

NATAN, DRESDYN, KASOLA, SOLTEC, ALINA

India: SFCT, LSTF, Hall-IV Hydraulic test Facility

Italy: ISA1

Korea, Update

STELLA-1, STELLA-2,

Korea

iHELP?, PRESCO?, SELFA, FAMECT/FAMPEX?

Latvia:

FCS-100?, SSL-EMT

Russia

IRS-M, SID, VTS, Protva-2, SAZ + Updates

**LFR: New 16, Update 34**

Belgium:

LEVUSE, OSCAR, SLEEVE, POLONIUM Lab, Update of 15 facilities

China: INEST Update

CLEAR-S, KYLIN-II – (8 facilities incl. 3 NEW) CLEAR-0, CRDM, IVFRM,

China CNPRI

LEPUMP, LEREFM, LETEA, LECHEM, CORTEST, POST, LELOCO, LECOTH, LEMETS

EC, JRC (The Netherlands)

LILLA

France:

CICLAD, STELLA

Germany:

KALLISTAR=SGTR, PRETULA, nELBE, CORRIDA, CRISLA, CORELA, COSTA, FRETHME, THEADES, THESYS, MINIPOT

Italy:

Nacie-up

Japan, Update

TEST STAND FOR FUNDAMENTAL LBE TECHNOLOGY, OLLOCHI, JLBL-3,

JLBL-4, IMMORTAL_mockup, TEF

Latvia

LMCS

Romania:

ATHENA, ChemLab, HELENA-2, ELF

Switzerland:

LISOR
Example: Update of the CLEAR-S Profile

**FIG. 1. Scheme of the CLEAR-S facility**

- **< 2016**
- **2019 >**

**Scheme/diagram**

- **CORE SIMULATOR**
  - **MAIN PUMP**
  - **MAIN HEAT EXCHANGER**
  - **RVACS**
  - **DHR**
  - **MAIN VESSEL**

- **AIR COOLER**
- **GENERATING SYSTEM**
- **TRANSFER VESSEL**
- **STORAGE TANK**

**3D drawing/photo**
A task to prepare a database of experimental facilities supporting the development of high-temperature reactor (HTR) technology was started by December, 2018.

The scope includes facilities that
- were used in the past
- are currently being used for this purpose.

The database supports:
- preserving knowledge related to these facilities
- future development of HTR technology.

To be incorporated as part of the HTGR Knowledge Base.
IAEA’s Database of Experimental Facilities for HTRs (2/5)

• At this stage of the task, information is being stored in individual Word files, one for each facility.
• A draft Word template for capturing essential information about a facility was developed, and is currently being applied.
• The information in these files is expected to be transferred to a computer database that can be efficiently queried at a later stage.
  – Desktop-based and/or web-based databases may be developed.
IAEA’s Database of Experimental Facilities for HTRs (3/5)

- At this initial stage, the only source of information being used is IAEA reports.
- We are searching these reports to identify facilities and associated information.
- Due to the nature of this process, the amount and level of detail of the information varies substantially between facilities.
  - In other words, we found considerable information for some facilities and little information for others.
IAEA’s Database of Experimental Facilities for HTRs (4/5)

• In the next stage of the database development, we are considering to request representatives from Member States to:
  – Verify that the information in the files is correct and up to date.
  – Contribute additional information for those facilities that we have already identified.
  – Identify additional relevant facilities and provide their associated information.
IAEA’s Database of Experimental Facilities for HTRs (5/5)

- So far, we have identified about 115 facilities that are potentially related to HTR technology

- Examples of currently identified facilities:

<table>
<thead>
<tr>
<th>Facility</th>
<th>Member State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dragon Reactor</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Fort St. Vrain</td>
<td>United States</td>
</tr>
<tr>
<td>HTR-10</td>
<td>China</td>
</tr>
<tr>
<td>HTTR</td>
<td>Japan</td>
</tr>
<tr>
<td>IVV-2M</td>
<td>Russia</td>
</tr>
<tr>
<td>PBMR Fuel Development Laboratory</td>
<td>South Africa</td>
</tr>
<tr>
<td>SANA</td>
<td>Germany</td>
</tr>
</tbody>
</table>

FORT ST. VRAIN – 842 MWt (U.S.A.) 1976 - 1989

THTR – 750 MWt (FRG) 1986 - 1989

DRAGON – 20 MWt (U.K.) 1964 – 1975

AVR – 46 MWt (FRG) 1957 - 1988

PEACH BOTTOM 1 – 115 MWt (U.S.A.) 1967 - 1974
Open for Cooperation

• IAEA LMFNS Catalogue
  – Experimental Facilities in Support of Liquid Metal cooled Fast Neutron Systems
  – Online since 2016; updated in 2019

• IAEA’s Database of Experimental Facilities for HTRs
  – Under Development

• In Cooperation with GIF R&D Task Force on Research Infrastructures
Atoms for peace and Development...

Thank You!

email: FR@IAEA.ORG