



*Knowledge Preservation
&
Data Collection on FR in Italy*

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*Technical Meeting on
Status of IAEA Fast Reactor Knowledge Preservation Initiative
03-05 December 2013, Vienna*

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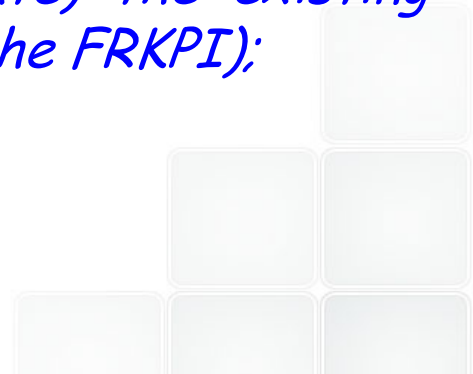
Knowledge Preservation & Data Collection on FR in Italy



Italian past activities on FRs have produced a significant amount of knowledge and know-how;

With respect to the objectives of FRKP Initiative, the Italian position is to contribute to:

- => reduce the risk and mitigate the consequences of the loss of knowledge and know-how on past activities on FRs in Italy;*
- => preserve and make accessible (as appropriate) the existing information on FRs within an agreed framework (e.g. the FRKPI);*



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ENEA activities on FRs area:

- *before 1986:*

ENEA promoted the design and building (together with the national nuclear industry) of the experimental 120MW Na-cooled PEC reactor;

- *after 1986 (Referendum '86):*

ENEA participates to FRs design and/or experimental activities inside bilateral and/or international programmes ;



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ENEA Main Knowledge Preservation Subjects :

1/2

PEC Project (interrupted at 60% of the total foreseen construction) archive:

- *designs of core, reactor, facilities and buildings,*
- *technical specifications and technical documentations,*
- *instrumentation designs, experimental data from Na facility (ESPRESSO & CEDI Facilities),*
- *this archive include also: designs, technical documentation, constructive designs & drawings of instrumentation of the PEC reactor, etc.;* [*slide 13*](#) [*slide 14*](#)

TAPIRO Fast source reactor based on the AFSR (Idaho Falls):

- *since 1971 TAPIRO RR has been and is still involved in the FRs research activities;*
- *rich archive it is available (paper) containing important data from the experimental activities;*
- *efforts are underway to complete the archive of vast amount of information (paper & electronic format);* [*slide 15*](#)

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ENEA Main Knowledge Preservation Subjects :

2/2

Designs, technical documentation, constructive designs & drawings as well as documentation of experimental activities of interest in fast systems, of the ENEA facilities, i.e.:

CIRCE Facility; CHEOPE III Circuit; LECOR Circuit; PYREL II & III Facilities, etc.; [*slide 16*](#)

Documentation of ENEA participation on FRs activities in bilateral and/or international programmes:

- PRISM, CAPRA and BN800 Projects,*
- PDS-XADS, IP-EUROTRANS/EFIT, ELSY Projects,*
- LEADER: LHM cooled Project ,*
- CP-ESFR Na-cooled Project ,*
- ACSEPT: Actinide reCycling by SEParation & Transmutation Project , etc.;* [*slide 17*](#) [*slide 18*](#)

EURATOM/FP authorization is required ?

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Italian Frame:

The Italian Parliament Law n° 99/2009 (July 23th) defines at that time the main objectives of ENEA as National Agency:

- Contribute to development of innovative nuclear energy generating systems able to compete in the perspective of the national energy policy in the next years;*
- Contribute to development of innovative systems able to match public acceptability and economical interest and to support the development of the nuclear energy option in the country.*

For the development of innovative nuclear energy systems ENEA recognizes that it has to be based on past and current knowledge, including experts knowledge ;

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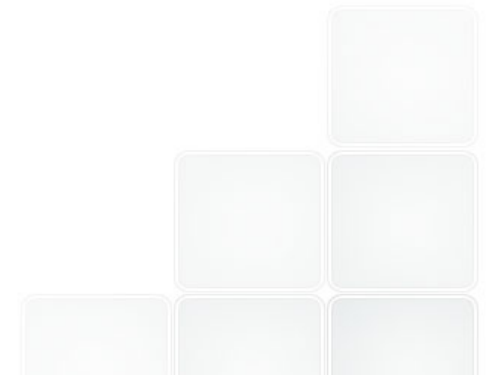


- *after Fukushima accident :*

The referendum of 2011 (imposing 5 (!!!!) years of Moratorium) has modified the spirit of the Law, while economic crisis has modified priorities;

HOWEVER;

ENEA is still recognising the importance of Knowledge preservation on FR in support to its R&D activities for reactors of new generation (Generation-IV).



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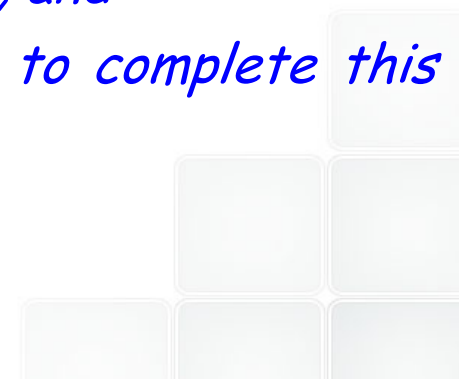
ENEA approach to Knowledge Preservation on FR

In ENEA conception this process will be a two steps process:

- development of an ENEA FRs Archive,*
- managed access to (part of) the ENEA FRs Archive in the framework of the IAEA FR Knowledge Preservation Initiative, (various levels of confidentiality);*

Now ENEA is still in the first phase of the process:

- development of an ENEA FRs Archive , and*
- need time (and certainty of funding) to complete this process !*



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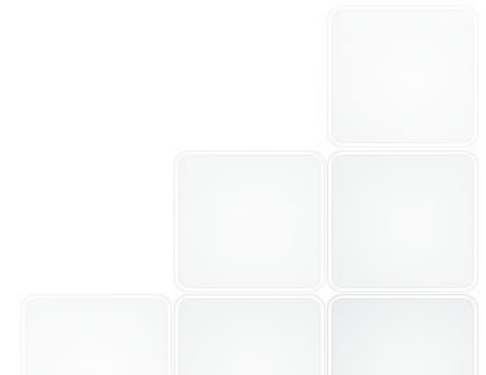
STATUS of

slide 19

*Information gathering necessary for the development of the
ENEA FRs Archive:*

Collection of information concerning:

- *site (location) of the material,*
- *contents,*
- *support: paper, microfiche, magnetic tape, e-format,
other,*
- *Conservation state, etc;*



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On the basis of the assessment of collected information, a work plans will be developed.

ENEA will then take a decision on implementation of the work plan for the ENEA FR Archive;

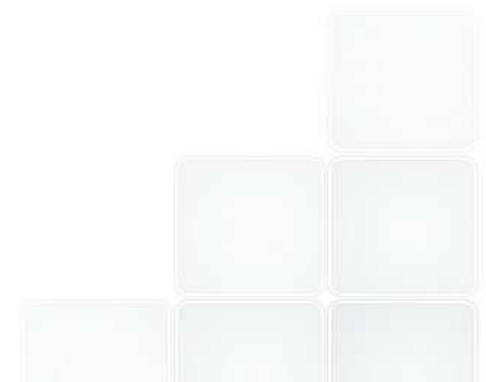
We expect that:

=> Archivists will need to interact with the Agency also during the first Step (ENEA Archive) in order to facilitate future access within the FRKPI;

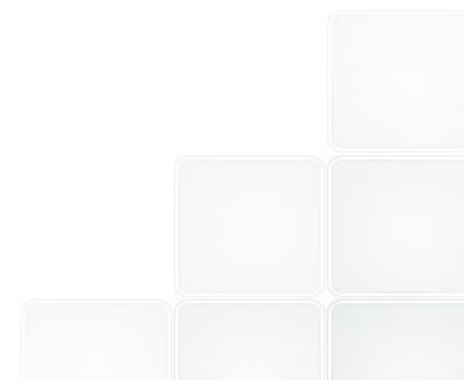
=> The FR-KOS methodologies (and equipment) available at the IAEA could be of interest during the implementation of the work plan.

Questions/Comments ?

Thank you for your attention *slide 1*



Backup slides



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ENEA Agency Activities on FRs Area before 1986: 1/2

PEC: FAs Testing and Qualification

*Experimental FR characterized by two independent Na-cooling loops
and two neutron coupled regions fuelled by (U,Pu)Ox with enriched UOx;*

*Building interrupted on 1986 (Referendum result) at the 60% of the
total foreseen construction;*

Very rich archive concerning:

- core, reactor, facilities and building designs,*
- technical specifications, technical documentations,
instrumentation designs, etc.*

*Very rich and important data from the experimental Na facility
(ESPRESSO & CEDI Facilities). slide 4*

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ENEA Agency Activities on FRs Area before 1986: 2/2

Some of PEC Archive contents: designs, technical documentation & drawings of:

- *FAs Handling Machine (ex NIRA design);*
- *VISUS: device for in Na visualisation of the FAs shuffling or refuelling movement;*
- *DRRG: device of cladding rupture detection;*
- *Devices for core loading and core blocking;*
- *technical documentation, constructive designs & drawings, documents of qualification (on PHENIX) for: FAs, CRs, Diluents and other Special assemblies;*
- *design, technical and qualification documentation of experiments on CEA facilities (i.e. PECORE experiment);*
- *more other.*

slide 4

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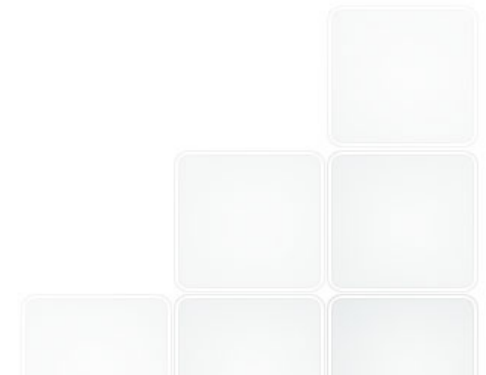
ENEA Main Knowledge Preservation Subjects:

TAPIRO: Fast source reactor based on the AFSR (Idaho Falls) designed by ENEA's staff, fuelled by 98.5%U-1.5%Mo alloy, with enrichment of 93.5% ^{235}U and He cooled, provided by 3 channels at the reactor midplane and 1 tangential channel (to the top edge of the core).

slide 4

Starting from the 1971 the ENEA Research Reactor TAPIRO has been and is still involved in the FRs research activities;

slide 4



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ENEA Agency Activities on FRs Area after 1986: 1/3

slide 5

ENEA participates with its own facilities to experimental activities for FR topics, in the framework of the EU FP:

- *CIRCE Facility: LM chemistry, Component development and Large-scale experiments in a "pool type" configuration;*
- *CHEOPE III Circuit: Pb-alloys Physical & Chemical properties, high content O_2 in Pb-alloys, Thermal conductivity measures and Pumping Systems development;*
- *LECOR Circuit: Pb-alloys Physical & Chemical properties, low content O_2 Pb-alloys, Component development and testing;*
- *PYREL II & III Facilities: Basic phenomena of electrolytic refining in molten salts, Pu & MA separation methods and separating process efficiency of the constituent metals in highly burnt nuclear fuel.*

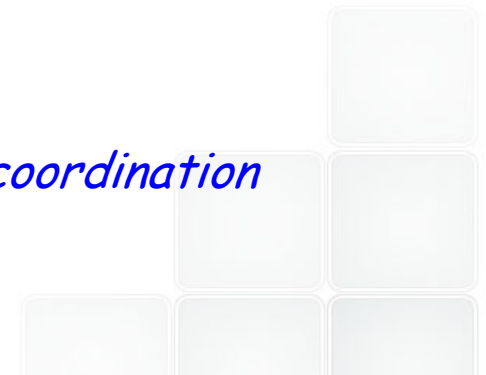
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ENEA Agency Activities on FRs Area after 1986: 2/3 *slide 5*

ENEA participates on FRs activities inside bilateral and/or international programmes;

- PRISM Mod. A, B and C neutron design activities (GE property):
5 years GE-ENEA collaboration agreement;*
- CAPRA Project neutron design activities under CEA coordination
(CEA property);*
- BN800 neutron design activities under IAEA/EC coordination
(Russian property);*



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ENEA Agency Activities on FRs Area after 1986: 3/3 *slide 5*

ENEA participates, together to the national both academic institutions and nuclear industries, on the EU 5th, 6th and 7th Framework Programmes on R&D activities on sub-critical and critical fast systems, i.e:

- PDS-XADS, IP-EUROTRANS/EFIT, ELSY and LEADER LHM cooled Projects;*
- CP-ESFR Na-cooled Project;*
- ACSEPT: Actinide reCycling by SEParation and Transmutation Project;*
- ENEA participates in GEN-IV reactor concept activities on FRs topics.*
- ENEA participates in OECD/NSC activities on FRs topics.*

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STATUS of Information gathering necessary slide 9

May / June 2012: Inspection at the PEC Archive in Brasimone site to control the included material and to check the status :

- For paper documentation not yet catalogued the conservation status is sometime close to critical;*
- For already catalogued paper documentation a good conservation status has been found;*
- It was identified a big strongbox full of micro-fiches of PEC project documentation , in excellent state of conservation;*
- The whole micro-fiches content it has not yet examined.*

