

# **IAEA NKM Programme**



# International Fast Reactor Knowledge Organization System

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## Fast Reactor Knowledge Preservation Initiative

 To capture, preserve, maintain and share with interested Member States knowledge on Fast Reactors which exists on national level and complement current and future Member States' nuclear knowledge capacity.



# Fast Reactor Knowledge Partnership



IAEA



# **FR KOS Project Objective**

 To develop a Knowledge Organization System into which existing national knowledge and information systems will fit, and which will complement and integrate current and future Member States' efforts to preserve fast reactor data and knowledge.



# **FR KOS Motivation factors**

- Continuing knowledge loss over decades
- Research and Development
- Nuclear Education, scientists and students
- From Nuclear Renaissance to Fast Reactors Innovative Renaissance, FR09
- Developed countries, Developing countries, Nuclear Newcommers



# **FR Knowledge Preservation Initiative**

- Contributors:
  - Participating Member States: China, France, Germany, Japan, Russia, UK, USA, India
  - Role of the IAEA
  - New members are welcome
- Common approach:
  - System requirements and implementation
  - o FR Knowledge Domain



# **Fast Reactors Knowledge**

#### **Technology development**

#### **Technology utilization**





# **Project milestones**



# NE Series Report NG-T-6.3 defines

- Taxonomy
- Basic Requirements

### for

Fast Reactor Knowledge Organization System



## **Fast Reactor Taxonomy**

 Fast Reactor Taxonomy is

 a hierarchical model
 of knowledge domain
 in the field of Fast Reactor Science and Technology



### **Fast Reactor Taxonomy**

- Covers
  - all possible types of fast reactors
  - all aspects of fast reactors
  - all stages of implementation of fast reactor technology
- Based on 2 dimensional matrix (2 top levels):
  - stages of implementation
  - technology elements

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## **Fast Reactor Taxonomy - Topic Trees**

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 Fast Reactor <u>Topic Trees</u> are digital <u>implementation</u> (in knowledge organization system) of Fast Reactor <u>Taxonomy</u>



## **Fast Reactor Topic Trees**

- Topic trees
  - are predefined queries
  - organized in tree-like form
  - with the purpose of searching on Fast Reactor (FR) Knowledge Base (KB)
  - are available to end users as a shared resources
  - encapsulate a hierarchical structure the expert's knowledge





# **Fast Reactors Knowledge – Where to get?**



### WHAT?

 we know what we want to find (Topic Trees)

### WHERE ?

 where can we search for that knowledge? (KR)



# Fast Reactor Knowledge Repository

# Sources of the FR Knowledge

- Member States
- INIS and other Information and Knowledge Systems
- Topical events
- Internet
- NuArch (future prospective)
- Information types
  - Limited to Metadata
  - Full texts or availability in metadata



# Fast Reactor Knowledge Repository

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## **Topic Trees and Document Collections**



- Topic trees include intellectual rules how to filter documents based on the selected
  - Topic Tree
  - Document repositories



## **Document Search – How it works?**

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	■ 18 0.92 ■ 10 0.02	Kesearch reactor core conversion from the use of highly enriched urani	UM to the U 1985-01-01	INIS-Technical-Doc-Additact
	■ 19 0.92 ■ 20 0.01	Simulation or coupled phenomena for Advanced Heavy Water Reactor (	(AFIWK): A 2007-01-01	INIS-rechnical-Doc-Systract
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			2003-01-01	
01		found !!!	2017	214 13 325
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# Outputs of Fast Reactor Knowledge Organization System

- Documents from the result list can be
  - exported in different format (XML HTML, text) which can be analysed further
  - made available for Member States
  - used by subject matter experts (SME)









#### FR KOS – Summary Graph



IAEA



#### FR KOS – Cross Matrix

File Edit View Chart Tools Help























Fast Reactor Knowledge Organization System

IAEA



# **Contributions to FR KOS (Content)**

- IAEA Contribution
  - 3 collections:
    - KNK-II, IAEA-TECDOCS, INIS Fast Reactors records
  - 50 000 metadata records, 9 000 full texts
- Member States
  - China, France, Germany, India, Japan, Russia, UK, USA
  - ?



# Conclusions

- Fast Reactors Knowledge Preservation (FRKP)
  - A unique experience to preserve comprehensive knowledge for future generations
  - International innovation in knowledge management technology
- Fast Reactor Knowledge Taxonomy
  - Unique and Single in the Nuclear World
  - 2 000 elements cover R&D, Design, Operation, Maintenance, Decommissioning and all fast reactor technology elements as well;
- IAEA contribution to Knowledge Base
  - 50 000 metadata records; 9 000 full texts
- Contribution from Member States
  - Russia submitted more than 500 records; format is a challenge
  - Contribution from other Member States is being encouraged
- Interest for Countries introducing Nuclear Power
  - Capacity building and Intellectual Capital
- Available for all participating members



# **Future KOS Opportunities**





### Fast Reactor Knowledge Organization System



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http://www.iaea.org/NuclearKnowledge/