Knowledge Preservation and Consolidation through an Innovative Multimedia Tool

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Joint Research Centre of the European Commission (JRC)
Who are we and what do we do?

**JRC (Joint Research Centre) is the European Commission’s in-house science service.** It provides the science for policy decisions, with a view to ensuring that the EU achieves its Europe 2020 goals for a productive economy as well as a safe, secure and sustainable future.

The JRC plays a key role in the European Research Area and reinforces its multi-disciplinarity by networking extensively with leading scientific organisations in the Member States, Associated Countries and worldwide.
Established 1957

7 institutes in 5 countries: Italy, Belgium, Germany, The Netherlands, Spain

2,845 permanent and temporary staff in 2010
1,398 scientific publications in 2010
125 instances of support to the EU policy-maker annually

Budget: €356 million annually, plus €62 million earned income

Where you can find us

Corporate Services – Brussels
IRMM – Geel, Belgium
Institute for Reference Materials and Measurements
ITU – Karlsruhe, Germany and Ispra, Italy
Institute for Transuranium Elements
IET – Petten, The Netherlands and Ispra, Italy
Institute for Energy and Transport
IPSC – Ispra, Italy
Institute for the Protection and Security of the Citizen
IES – Ispra, Italy
Institute for Environment and Sustainability
IHCP – Ispra, Italy
Institute for Health and Consumer Protection
IPTS – Seville, Spain
Institute for Prospective Technological Studies
What is this Presentation about?

- **JRC methodology in Knowledge Preservation**
- **A Multimedia tool developed for preserving knowledge on WWER reactors**
- **EC involvement on Fast Reactors**
Nuclear Knowledge Preservation Circle

Knowledge Preservation

Intellectual Property Rights

Call them for their old papers

@Component 1
(technology, materials, ....)

Identify initial key experts

Collection and Storage (scanning and OCR)

Data Validation by Experts

Organise Knowledge Consolidation Workshops

Tacit Knowledge

Summarize collected knowledge

ODIN

Database for long-term storage
Knowledge Consolidation Path

- Development of training courses through consolidation

Consolidate

Format

Educate

Knowledge Preservation
WWER (acronym of Water Water Energetic Reactor) is a type of Nuclear Reactor designed in Russia and similar by construction to a Pressurized-Water-Reactor (PWR) more common in the western countries. Approximately 50 WWER reactors are still in operation worldwide and 20 of them are located in European Union member states.
Knowledge Preservation

WWER (or VVER) Reactor

AES-2006 (VVER-1200)
Knowledge Preservation of WWER RPV – Difficulties (shared with FR case?)

- **Retirement of Senior Experts** who were present at the time when most WWER Nuclear Power Plants were designed and put into operation,
- **Generational gap** (due to years of decline in new constructions, only a limited number of people started their career in that area)
- **Non-electronic publishing in the past**
- **Limited dissemination possibilities**
- **Language** (many non-English publications from Eastern countries)
Start-of-Life Toughness
Irradiation Shift Prediction
Property-Property Correlation
Annealing and Re-Irradiation
Material Factor
Environmental Factor
Mechanisms & Microstructural Evolution
RPV Design Feature
Surveillance
Cladding
There is a huge amount of information and knowledge in WWER Reactor Pressure Vessel (RPV) embrittlement available, either published or easily available, but also publications difficult to trace. Especially those were at risk of being dispersed or lost due to a series of factors, including:

- Retirement
- Generational gap
- Non electronic publishing in the past
- Limited dissemination possibilities
- Language (many non-English publications from Eastern Europe countries)

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Multimedia Tool for KP

WWER Tool Video Example

**WWER RPV Integrity Assessment**

*What are the basic reasons to make a RPV integrity assessment?*

**Expert:** Milan Brumovsky

*The reactor pressure vessel is the most important component in the nuclear power plant for several reasons.*
WWER Tool Page Example

Video of the expert giving the presentation
And Subtitles

Additional material to download

Search a keyword among all the modules

Share the slide on social media (FB, twitter,...)

Main Slide with text and animations

Drop-down menus

Question Chooser
Example of Multiple Choice Test

Self-Training

Question 2/6

2. Cleavage fracture is related to:

- [x] The upper shelf
- [x] The lower shelf
- [x] Ductile initiation toughness
- [x] Brittle unstable fracture
- [ ] None of the above

Next question

Correct answer
Few More Details

Configuration Details

- Two Parts One for Professionals and Experts and one for Students
- Compact Knowledge: more than 10hrs of videos
- Free of Charge

Technical Details

- Completely developed in HTML 5 and PHP
- Browsable from portable devices
- Off-line version possible
- Additional documents and presentations are downloadable
Promotional Leaflet available

NEW
Multimedia Tool for KP
Multimedia Tool
Expert Modules

New multimedia training tool on WWER RPV embrittlement

The process

The Institute for Energy and Transport of the Joint Research Centre (JRC) of the European Commission, jointly with the International Atomic Energy Agency (IAEA), has developed an innovative multimedia knowledge package which is based on systematically collected and consolidated knowledge of top experts in WWER Reactor Pressure Vessel (RPV) Embrittlement and is meant to support training in the field.

The WWER (Water-Water Power Reactor) are a series of pressurized water nuclear reactors that were designed in the former Soviet Union and that are still in operation in several European and non-European countries.

The tool is programmed in HTML 5 language to allow flexibility and is browsable on tablets and phones. For classroom training, an offline version can be generated.

Start improving your nuclear knowledge now.
http://capture.jrc.ec.europa.eu/wwer/
FP7 Project CORONA using the tool

- Next February 2014 a Pilot Training Course will take place in Kozloduy created as part of the FP7 Project Corona

- Approx 20 professional will be trained on NPP life Management issues and a part of the course will be devoted to the WWER Multimedia Tool
Knowledge Preservation Summary

We have shown:

- A technique for Knowledge Preservation
- A platform to consolidate and transfer the Preserved Knowledge
GEN IV Syllabus in preparation

This syllabus consolidates and joins together some of the best European research projects and experts on the topic of Generation IV Nuclear reactors.

The book specially focusses on the safety design details of the reactors, is addressed to post-grad students and as a reference for workshops and training courses.

A Book + Multimedia tool will make a complete offer for Education and Training purposes.
Commission Contribution to Knowledge Preservation on Fast Reactors

Fast Reactor Development in Europe
### Role of Euratom Support

#### EURATOM Indirect Actions on Fast Reactors Development

<table>
<thead>
<tr>
<th>Projects</th>
<th>Period</th>
<th>Total budget</th>
<th>Topics</th>
</tr>
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<tr>
<td><strong>EISOFAR, ESFR, SARGEN</strong></td>
<td>2007-2013</td>
<td>14.0</td>
<td>(S)FR design and safety</td>
</tr>
<tr>
<td><strong>GCFR, GoFastR</strong></td>
<td>2005-2013</td>
<td>8.9</td>
<td>GFR design and safety</td>
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<td><strong>ELSY, LEADER</strong></td>
<td>2006-2013</td>
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<td>LFR design and safety</td>
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<td><strong>ACSEPT</strong></td>
<td>2008-2012</td>
<td>23.8</td>
<td>Fuel partitioning</td>
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<td><strong>GETMAT, MATTER</strong></td>
<td>2008-2015</td>
<td>26.0</td>
<td>Advanced structural materials</td>
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<tr>
<td><strong>F-BRIDGE, FAIRFUELS</strong></td>
<td>2008-2013</td>
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<td>Innovative fuels research</td>
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Questions?