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A knowledge transfer program for engineering students at master level at the UPM

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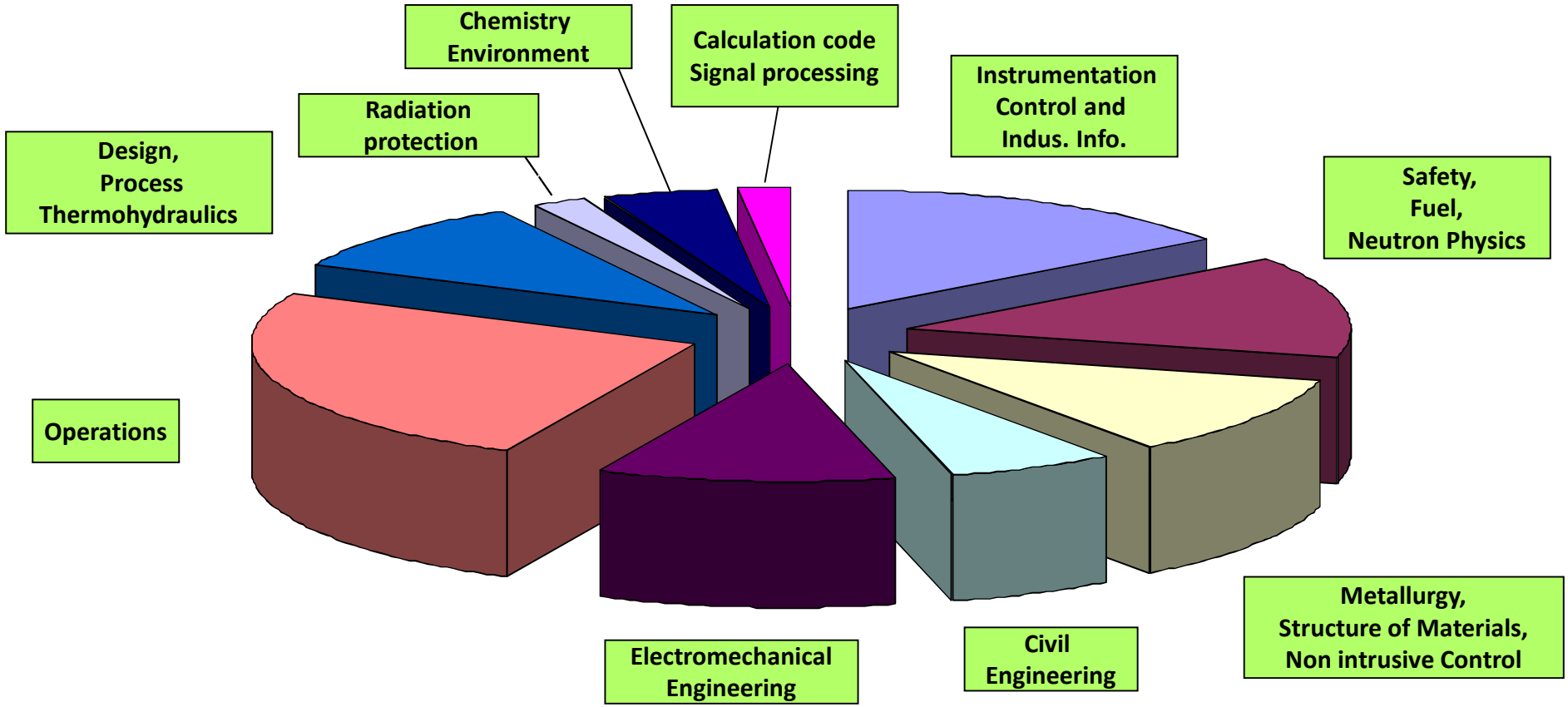
International Conference on Human Resource Development for Nuclear Power Programmes: Building and Sustaining Capacity

Specificities of the Nuclear Domain

Nuclear knowledge is unique in many ways:

- It is complex, requires significant financial commitment and government support and must be developed, shared and transferred over many generations
- The combination of personal skills and experience needed to turn this information into useable knowledge is particularly scarce.

Nuclear energy knowledge domains



How to implement it in the UPM?

Universidad Politécnica de Madrid

General view of ETSII-UPM, in Madrid

- 11 Schools of Engineering/Faculties
- Alumni:
  - 36.231 bachelor,
  - 3.321 master,
  - 3.190 PhD
- Teaching personnel: 3.386 people

Nuclear Engineering Department

- Only Nuclear Engineering Department in Spain
- More than 40 years of Education in Nuclear Engineering
- Personnel: 14 professors,10 PhD students, 3 Researchers
- One Laboratory
- One full-scope PWR simulator
- Main research areas:
  - Science and Technology of Nuclear Fission Advanced Systems
  - Inertial Confinement Fusion and Fusion Technology

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IAEA Regional Workshop on
KNOWLEDGE MANAGEMENT FOR NUCLEAR ENGINEERING COURSES
7 November – 11 November 2011
Karlsruhe, Germany

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What is the scope?

- To create a knowledge management culture in the new generations coming to the nuclear area.
  - > to make easy the needed knowledge transfer with the experienced generations.

How to implement it in the UPM?

- First “Nuclear Knowledge Management Seminar” (March 2012)
  -> Master in Nuclear Science and Technology
    - Equivalent to 1 ECTS
    - 15 students
- Second and Third “Nuclear Knowledge Management Seminar” (October 2012 and November 2013)
  -> Master in Power Generation
    - 4 hour “hands-on-traning”
    - 15 students
- Future:
  - Consolidate it in both master studies
  - Apply for a “competence development” subject at UPM (June 2014)

What has been transmitted to the Master students?

Practical tools to improve the NKM in the day by day in their work

To create a knowledge management culture

Three examples of practical tools

- I have won the lottery theory
- Keep the track
- Know your partner!

How to adapt the NKM theory to the master students?

«I have WOn the Lottery Theory (WOLT)»*

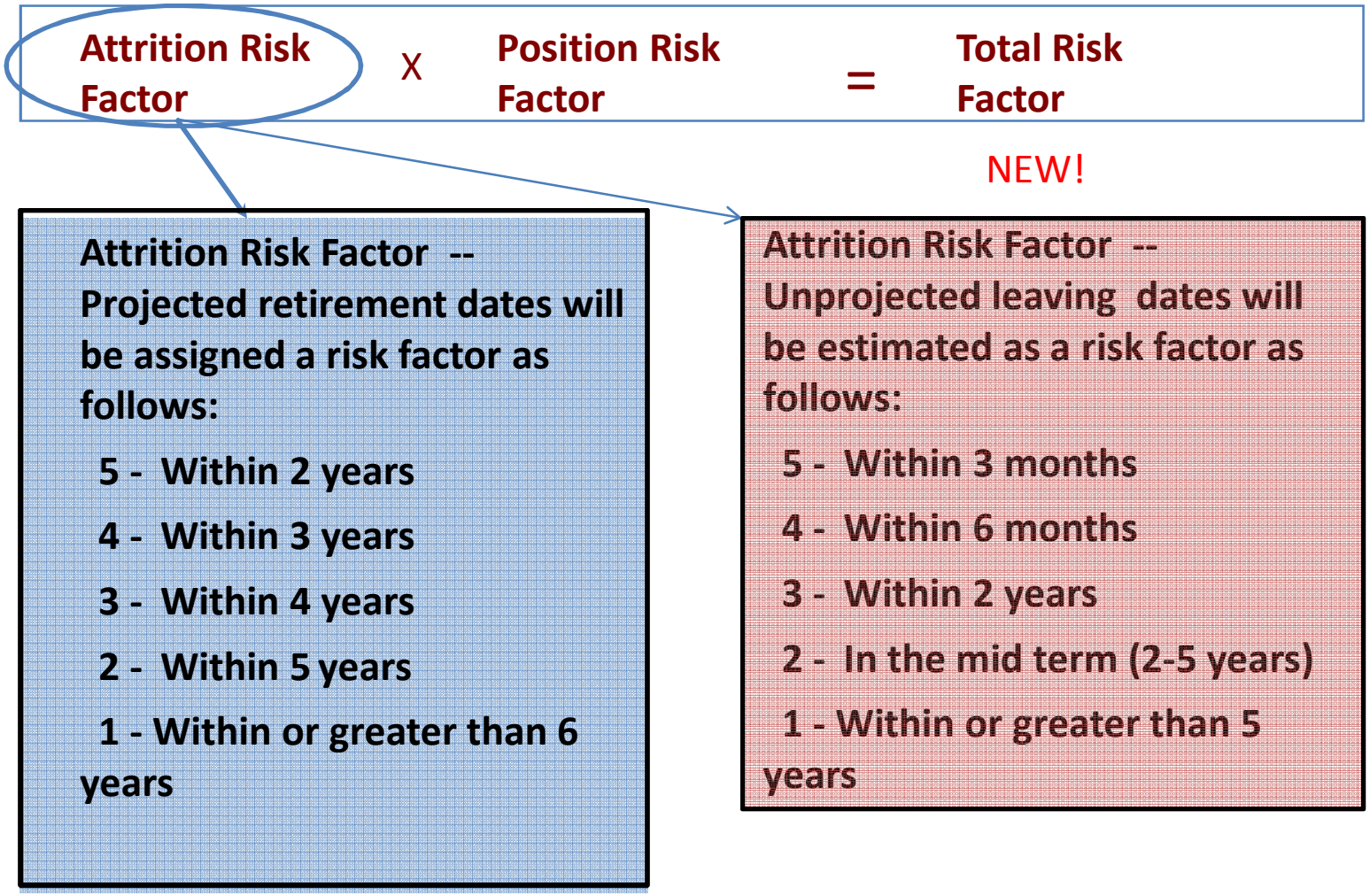
* By UPM

The world has changed!!

- There is a NKM problem by the nuclear employees retirement

- There is also a NKM problem:
  - The young generation people change more frequently their jobs!

Knowledge Retention



Example of hands on training

- One technological company
- Different combinations of experience and non experience people
  - 2 people over 60 years
  - 3 people less than 30 years
  - 1 person of 40 years
  - 1 person of 50 years
  - 2 persons of 37 years

- Budget restrictions
- Low work load

How to implement a KM program?

Managing your own knowledge…

Keep the track:
Managing your information

- Create readable and undestandable documentation
- Order and classify your daily data
- Mantain a database
- Use a database
- Agree with your partners about the way of doing that
- Use the available tools

…just a interesting story…

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Know your partner!

- Periodic meetings in your group
  - Sharing the experiences and the problems
  - Show the different ongoing projects
- Ask before contract
  - Be aware of the capacities of your colleages
- Technical seminars from your partners
  - Let the people to talk about their work
  - Preserve and share knowledge

Conclusions

Practical tools to improve the NKM in the day by day in their work

- How to make their everyday work to be more traceable:
  - Knowledge Organization Systems (KOS)
- Identify, inside the corporation, the people with critical knowledge (independent on the age!)
  - Evaluate the risk of losing that knowledge
  - Planify the strategy of knowledge transfer
  - Avoid that all the critical knowledge of one are is concentrated in one person (knowledge islands)
- Know the knowledge of your partner

Publications

- CREATING A NUCLEAR KNOWLEDGE MANAGEMENT CULTURE IN THE NEW NUCLEAR ENGINEERS GENERATIONS AT UPM, AN INITIATIVE OF THE IAEA. ICENES 2013, May 2013, Madrid (Spain)
- Seminario de Gestión del Conocimiento en el Sector Nuclear en la UPM, una iniciativa de la IAEA. Spanish Nuclear Society Annual Meeting, September 2013, Cáceres (Spain)

Thank you for your attention!

Any question?