APPLIED NUCLEAR KNOWLEDGE MANAGEMENT IN AUSTRIA

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Austria’s Nuclear Position
1955 to 2016

- December 8th 1953: „Atoms for Peace Declaration“ by President Eisenhower
- 1955 First Geneva Conference
- Austria built three research reactors:
  - one industrial oriented 10 MW at Seibersdorf (decommissioned in 1999)
  - one 250 kW university training reactor in Vienna (operating)
  - one 1 kW university training reactor in Graz (decommissioned in 2005)
- These three reactors served to plan at least three nuclear power plants (NPP) in the 1970-ies and 80-ies in Austria
- In February 1972 construction started for a 723 MWe AEG-KWU BWR (design 69)
- Mid-70-ties start of anti-nuclear movements world-wide and also in Austria
- Chancellor Kreisky called for a nuclear referendum preceded by a massive public information campaign, the referendum turned out slightly anti-nuclear as for purely political reasons nuclear supporters voted anti-nuclear hoping to change the government
- Work was stopped at the almost finished NPP and acts now as 1:1 museum of a BWR about 1h drive west of Vienna
- Austria remains a strong anti-nuclear country in the heart of Europe
Why Nuclear Knowledge Management in Austria?

- The first and second generation of nuclear engineers from the initial period have gone, the interest in nuclear has declined however at the Atominstitut about 10 to 15 MS and PhD students graduate per year in nuclear related areas.
- The Austrian Nuclear Society (www.oektg.at) includes about 70 young generation students in nuclear topics.
- Austria is surrounded by about 20 NPPs within 100 km from its borders.
- New NPP’s are under planning in Czech Republic, Slovakia and Hungary.
- Austria needs specialist to discuss transborder issues of existing and planned NPP’s within the EC regulations.
- The Atominstitut is the major player in knowledge transfer from one generation to the next and is also a partner for bilateral discussions in transborder issues.
The Atominstitut at the Technical University Vienna

Operates a 250 kW TRIGA reactor since March 1962
The TRIGA Mark II Reactor Vienna

- It is the only operating nuclear facility in Austria
- It is uniquely used for knowledge preservation in a country which is basically anti-nuclear
- This is not only applied to national students but also to international students and junior professionals in the fields of:
  - Nuclear technology
  - Radiation protection
- About 10 Masters and 3 PhD graduate per year through the TU Vienna from Atominstitut
Four Examples of Applied Knowledge Management

- IAEA Safeguards Traineeship Program (six weeks course)
- Eastern European Research Reactor Initiative (EERRI), six weeks course
- Nuclear Technology Education Consortium (NTEC), one week course
- Training and Retraining of Slovak NPP staff, one week course
Country list of IAEA Junior Safeguard Trainees trained between 1984 to 2016

- 1984: Bangladesh, China, Indonesia, Iran, Libyen, Malaysia, Nigeria, Philippinen
- 1986: Brasil, China, Indonesia, Korea (2), Malaysia, Morocco, Saudi Arabien, Syrien, Venezuela
- 1987: Bolivia, Burma, China, Irak, Iran, Korea, Zaire
- 1988: Jordanien, Korea, Kuba, Pakistan, Thailand
- 1989: Äthiopia, Ecuador, Ghana, Irak, Jordan
- 1990: Cameroon, Mongolia, China, Zambia
- 1993: Albania, Kenia, Syria, Zambia
- 1996: Armenien, Belarus, Cuba, Jordania, Sri Lanka, Thailand
- 1998: Ghana, Iran, Yemen, Kenia, Syria, Vietnam
- 2000: Cambodia, Mongolia, Myanmar, Portugal, Uganda, Zimbabwe
- 2002: Georgia, Indonesia, Namibia, Nigeria, South Africa, Uganda
- 2004: Estonia, Jamaika, Namibia, Peru, Thailand, Sudan
- 2006: Turkey, Madagascars, Yemen, Malaysia, Mongolia, Zimbabwe
- 2008: Albania, Kenia, Singapore, Sudan, Thailand Tunesia,
- 2010: Bangladesh, Belrus, Indonesia, Jordan, Myanmar, Uganda
- 2012: Central African Republic, Chile, Malaysia, Sudan, Namibia, South Africa
- 2014: Cambodia, Ghana, Myanmar, Nepal, Tajikistan, Tunesien
- 2016: Cambodia, Iraq, Myanmar, Thailand, Vietnam, Zimbabwe
What is the EERRI coalition?

- Eastern European Research Reactor Initiative

Members:
- Austria: Technical University Vienna/ Atominstitut
- Czech Republic: Czech Technical University and Rez Nuclear Research Centre
- Hungary: KFKI Budapest Research Reactor and Budapest University of Technology and Economics
- Slovenia: Joszef Stefan Institute
- 6 research reactors in 4 countries
  - 2 TRIGA type reactors - ATI, IJS,
  - 4 Training reactors - VR-1, Rez, BUTE, KFKI,
- Power from 10 W to 10 MW
- Both steady state & transient mode of operation
Example: EERRI Research Reactor Initiative
List of Countries with EERRI Trainees
(totally 93 fellows trained since spring 2009)

- Azerbaijan
- Brazil
- Chile
- Colombia
- Democratic Rep. of Congo
- Egypt
- Estonia
- Ghana
- Iraq
- Jamaica
- Jordan
- Kenia
- Lebanon
- Libya
- Malaysia
- Mexico
- Myanmar
- Nigeria
- Oman
- Pakistan
- Philippines
- Saudi Arabia
- South Africa
- Sudan
- Syria
- Tansania
- United Arab Emirates
- Vietnam
- Yemen
EERRI experiences and conclusions

• The six week course is a typical example of a hands-on training course, which is extremely difficult to organize by single reactor or single university.

• The EERRI course is an excellent example of research reactor networking and coalition activity with the aim to transfer knowledge from one region (country) into another region (country).

• EERRI is one typical example of an international course with hands-on capacity building and international knowledge transfer.
NTEC-Nuclear Technological Education Consortium (UK) University of Manchester

• Since July 2007 sixteen training course on Reactor Physics and Kinetics, Radiation Protection and I&C Systems
• Course two-times a year
• Six students per group
• Course is part of the UK MSc Programme in Nuclear Science and Technology
Training and retraining of NPP staff

- Slovakia operates four VVER 440/213 NPPs at Bohunice and Mochovce
- Two VVER 440/213 NPPs are under commissioning procedures
- No research or training reactor exists in Slovakia, the nearest reactor is the TRIGA reactor in Vienna about 70 km from Bratislava
- The TU Bratislava under contract of retraining of NPP staff cooperates with the Atominstitut and every year hands-on retraining courses for NPP staff carried out using the TRIGA reactor
References


Thank you
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