



Business from technology

# **NKS/DIGREL**

## **Related activities at VTT**

Project seminar, September 14, 2010

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## SAFIR-2010 - The Finnish Research Programme on Nuclear Power Plant Safety 2007 – 2010

- <http://virtual.vtt.fi/virtual/safir2010/>

Ongoing I&C system safety related projects

- Model-based safety evaluation of automation systems  
MODSAFE
- Certification facilities for software CERFAS
- Requirements engineering in nuclear power plant automation VAHAYA
- Challenges in risk-informed safety management  
CHARISMA
  - PSA-methods development
- Similar projects can be expected in the next programme  
SAFIR-2014



## Harmonised Assessment of Reliability of MOdern Nuclear I&C Software (HARMONICS)

- Proposal to Euratom Fission-2010-7.0.2: Reliability of programming for automation
- Part of Euroatom-CAEA co-operation programme
- Objectives
  - To ensure that the nuclear industry has well founded and up-to-date methods and data for assessing software of safety systems of Gen-II and Gen-III NPPs
  - To propose a more systematic and consistent, but also realistic and practical, approach for the software assessment
  - To address the complete software and system lifecycle, from requirements specification to architectural and detailed design, development, testing, acquisition, use and maintenance



## HARMONICS scope

- software verification & validation (V&V)
- software safety justification
- quantified evaluation of the software-related aspects of system reliability

The main steps are:

- Clarification of needs, practices and experiences
- Development of common approaches to the assessment and justification of the reliability of safety-critical software
- Test of the approaches in case studies
- Assessment of results from the case studies
- Dissemination of results (including a public case study)

## HARMONICS partners

No.	Participant organisation name	Country
1.	VTT	Finland
2.	Électricité de France (EDF)	France
3.	Institute for Safety Technology (ISTEC)	Germany
4.	Adelard LLP/CSR (ADEL)	UK
5.	Swedish Radiation Safety Authority (SSM)	Sweden
6.	State Nuclear Power Automation System Engineering Corp. (SNPTC/SNPAS)	China
7.	Nuclear and Radiation Safety Center (NRSC)	China
8.	Institute for Standardization of Nuclear Industry	China
9.	Harbin University of Technology	China
10.	CNNC Jiangsu Nuclear Power Corp.	China
11.	China Techenergy Co., Ltd. (CTEC)	China
12.	Shanghai Automation Instrumentation Co., Ltd (SAIC)	China

**In addition, a broad end user group will be invited to follow the project**

## **HARMONICS status September 2010**

- The proposal has passed the first evaluation
- Under negotiation with the Commission
- The plan is to finalize working plans and agreements within next months
- Planned start in the beginning of 2011, duration 4 years
- End user group will be contacted in 2011