



nordic nuclear safety research

nks

DENMARK

FINLAND

ICELAND

NORWAY

SWEDEN

A common Nordic view

Nordic problems need Nordic solutions. NKS aims to facilitate a common Nordic view on nuclear safety and radiation protection including emergency preparedness. This requires common understanding of rules, practice and measures, which may vary between countries, as well as with time. The work builds on a foundation of more than fifty years of Nordic collaboration on related issues.

Securing Nordic competence and knowledge building

Through collaborative NKS activities, Nordic competence and capabilities are maintained and strengthened, and solutions to Nordic problems are disseminated through a sustained informal network. NKS publications are available cost-free on the internet. A special effort is made to engage young scientists and students, to ensure knowledge and expertise for the future.

Strengthening response capacities

By maintaining vital informal networks between Nordic authorities, nuclear power companies, scientists and other stakeholders, the region's potential for a fast, coordinated and targeted response to urgent issues is strengthened. Thereby, problems can be tackled quicker, more efficiently and consistently and at lower cost than if they needed to be addressed on a national scale.

Addressing current societal questions

NKS keeps an open eye to societal changes and events that might influence requirements and perception of nuclear safety, radiation protection and emergency preparedness in the Nordic countries. For instance the Fukushima accident prompted the arrangement of an NKS joint reactor safety and emergency preparedness seminar on lessons learned and future implications for Nordic society.

NKS activities

These can take the form of research activities, test exercises or information collation/review exercises. Alternatively they can aim to harmonise approaches to common problems or spread and distribute knowledge and results through seminars, workshops and educational/training courses. Common to all NKS activities is that the results should be beneficial and made available to concerned end users in all Nordic countries. Aspects of nuclear safety, radiation protection and emergency preparedness may be combined in one activity.

Research areas

Areas of interest covered by NKS activities fall under two main programmes, NKS-R and NKS-B, which cover the following specified research areas.

NKS-R programme:

- Thermal hydraulics
- Severe accidents
- Reactor physics
- Risk analysis & probabilistic methods
- Organisational issues and safety culture
- Decommissioning, including decommissioning waste
- Plant life management and extension

NKS-B programme:

- Emergency preparedness
- Measurement strategy, technology and quality assurance
- Radioecological assessments
- Wastes and discharges

The logo for NKS (Nordic Nuclear Safety Research) features the lowercase letters 'nks' in a bold, dark blue, sans-serif font. The letters are closely spaced and have a slight shadow effect.

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Some recent examples of NKS activities

- **Development of guidelines for reliability analysis of digital systems**

Digital protection and control systems are appearing as upgrades in older nuclear power plants and are commonplace in new plants. To assess the risk of nuclear power plant operation and to determine the risk impact of digital systems, there is a need to quantitatively assess the reliability of the digital systems in a justifiable manner. Practical guidelines for analysis and modelling of digital systems in probabilistic safety assessment for nuclear power plants are developed in this activity. (NKS-R DIGREL)

- **Experimental and numerical studies on suppression pool issues**

Rapid steam condensation processes in boiling water reactor suppression pools are modelled, using both experimental and computational methods. Experiments are conducted in a test facility using the latest measurement technology such as particle image velocimetry and a modern high speed camera. The goal is to produce high quality measurement data which is used for development and validation of simulation tools. (NKS-R ENPOOL)

- **In-vivo whole body measurement of internal radioactivity**

The activity was aimed at harmonising the calibrations of whole body measurement equipment in the Nordic region and to evaluate the quality status of measurements by means of a proficiency test exercise. The exercise consisted in determining the activity of a phantom filled with certified radioactive material, homogeneously distributed inside the phantom (NKS-B PIANOLIB).

- **Radiochemical analysis for nuclear waste management in decommissioning**

An effort has been made to maintain and improve the Nordic competence in analysis of radionuclides in decommissioning waste samples. New and more sensitive methods have been developed for various radionuclides, employing, e.g., liquid scintillation counters and mass spectrometry based equipment (NKS-B Radwaste).

How to apply

Nordic companies, authorities, organisations and researchers can submit proposals for NKS activities under the NKS-R and NKS-B programmes. Usually at least three of the five Nordic countries should participate in an activity. Activities submitted under annual calls for proposals are assessed according to criteria important to the objectives of NKS, with final funding decisions made by the NKS board.

Do you have an idea for a nuclear safety or radiation protection related activity? Contact us at nks@nks.org

Financing of NKS activities

NKS is mainly financed by Nordic authorities, with additional contributions from Nordic organisations that have an interest in nuclear safety. The budget for NKS in 2012 exceeded 8 million Danish kroner (€ 1.1 million). In addition to the funding sought from NKS, participating organisations are asked to provide a similar amount of in-kind contributions. This may take the form of working hours, travelling time or laboratory resources. Without these in-kind contributions it would not be possible to carry out NKS activities.

Main financiers

- Danish Emergency Management Agency
- Ministry of Employment and the Economy, Finland
- Icelandic Radiation Safety Authority
- Norwegian Radiation Protection Authority
- Swedish Radiation Safety Authority

Co-financiers

- Fennovoima Oy, Finland
- Fortum Power and Heat Ltd, Finland
- TVO, Finland
- Institute for Energy Technology (IFE), Norway
- Forsmark Kraftgrupp AB, Sweden
- Nuclear Training and Safety Centre AB (KSU), Sweden
- OKG AB, Sweden
- Rinhals AB, Sweden

The NKS website

On the NKS website (www.nks.org) information is available on funding opportunities, travel support for young scientists, current activities and upcoming seminars. Presentations from seminars held are available for download as are reports from all completed NKS activities. It is also possible to discover more information on NKS and the history of Nordic co-operation in nuclear safety. You can also reach the NKS website using the QR code.



NKS email list

NKS sends out newflashes and newsletters throughout the year providing information on call for proposals, upcoming seminars and published reports. If you wish to join the NKS email list please sign up at www.nks.org or scan the QR code.



NKS Mobile Reports

All NKS reports from all completed activities can be reached conveniently also with your mobile devices at mobile.nks.org or simply by scanning the QR code.



Contact

If you wish to learn more about NKS and NKS activities visit our website or contact the NKS secretariat.

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