



Nordisk kernesikkerhedsforskning
Norroenar kjarnöryggis rannsóknir
Pohjoismainen ydinturvallisuustutkimus
Nordisk kjernesikkerhetsforskning
Nordisk kärnsäkerhetsforskning
Nordic nuclear safety research

NKS-B Framework Call for Proposals 2012

Justin Gwynn
Norwegian Radiation Protection Authority
June 2011

General aspects

NKS activities are sought and carried out under two broad research programmes. The NKS-R programme focuses on reactor safety and technology, whilst the NKS-B programme covers issues related to emergency preparedness, measurement techniques, radioecological assessments and the management of radioactive waste and discharges associated with the nuclear sector. New NKS activities are sought under annual call for proposals for each programme and decisions on funding are made by the NKS board. Where an activity proposal contains elements of interest to both the NKS-R and NKS-B programmes, the proposal may be treated as a 'cross-over' activity and treated accordingly as per the discretion of the NKS board. NKS activities only receive funding for 1 year at a time and will typically run from January to December. Where the overall scope of an activity is planned to be carried out over more than one year, additional funding must be sought through the annual call for proposals for each subsequent years work. Typically, a proposal for a NKS activity should include participation from at least three Nordic countries. The participation could be in either direct involvement or by using the end results. Where applicable, applicants should consider inviting those Nordic countries that may have an interest in participating in the planned activity. In the certain cases where interest is restricted, a bilateral cooperation may be approved.

Aims of the NKS programmes

The main aims of both the NKS-R and NKS-B programmes are:

- To maintain and strengthen Nordic competence in the areas of nuclear safety and research
- To develop close informal networks between scientists, workers and end users from the relevant Nordic authorities, organisations, industries and university departments that are concerned with the various aspects of nuclear safety and research.

Proposals submitted to annual call for proposals for both the NKS-R and NKS-B programmes should primarily address these main aims. Equally, the technical/scientific and pedagogic merits of each proposal will be considered in the evaluation process, as well as whether the proposal will produce distinct and measurable goals. In addition, it is important that a proposal demonstrates that the output from the activity will be of use to at least one relevant end user group. To ensure a consistently high level of Nordic competence and qualification in the areas of nuclear safety and research in the long run, the involvement of young scientists and workers in NKS activities is actively encouraged. The Nordic universities and technical institutes have an important role in this respect and the active participation of PhD and MSc students will be viewed positively by the NKS board. Proposals should also demonstrate (where applicable) how the planned work builds on results from previous NKS activities and/or national and international research programmes. In this connection, NKS activities can be designed as 'pilot' studies before seeking larger funding from national and international research programmes for continuation of the work funded by NKS.

Types of NKS activities and expected output

NKS activities can be knowledge seeking and competence building taking the form of research activities, test exercises and information collation/review exercises or aim to spread and distribute knowledge and results through seminars, workshops and educational/training courses. Whatever the form of the planned activity, a final report will be required at the end of the year's work which will then be published on the NKS website.

Research activities should be based on relevant novel investigations or the development of an area of research towards a Nordic perspective. Final reports for research projects should be produced in line with standards expected for scientific publications. Test exercises can take the form of measurement intercomparisons or activities that test competencies across the Nordic countries. Such activities should seek to address any problems highlighted from the exercise in the final report in order to increase knowledge and competencies where necessary. Information collation and review exercises should be designed to fill knowledge gaps or develop existing methodologies for use within Nordic countries. Final reports from such activities should in line with standards expected for research activities.

Seminars and workshops should aim to develop or build upon existing informal networks and should be preceded by preparation work by participants. Experts from Nordic and/or non-Nordic countries can be invited to address seminars and workshops to provide additional value to these activities. Final reports for such activities should take the form of conference proceedings, containing extended abstracts from each speaker as well as a final overview of any discussions and conclusions. Presentations (slide shows) from such activities can be hosted on the NKS website but should not be included in the final report. Educational and training courses can contain practical and/or theoretical elements and may include exchange visits between organisations and institutes. Such activities are particularly relevant where they are aimed at young scientists and workers. Final reports for educational and training course should contain all course material presented as well as feedback from the participants.

NKS-B Programme

Proposals for NKS-B activities (research, seminar and education) should fall into at least one of the following four main categories:

- Radiological and nuclear emergency preparedness
- Measurement strategy, technology and quality assurance
- Radioecology and environmental assessments
- Management of radioactive waste and discharges

Emergency preparedness has been a major priority in all the Nordic countries for many years. One of the major challenges is the complexity of the systems and the need to integrate knowledge from many different areas (nuclear physics, measurement techniques, environmental sciences, radiobiology, information and communication technology etc.). Continuous development and improvement is necessary and existing knowledge and tools must be made and kept operational.

In addition to the threats from potential nuclear accidents, threats related to the possibility of malicious uses of radioactive or nuclear substances are now seen as a major concern which can require, specialized competence regarding measurement/analytical techniques and radiation protection assessments. Optimized use of national resources and the potential need for assistance between neighbouring countries is also a challenge. The communication with media and individual members of the public is also a challenge in such situations, and common Nordic views and approaches are important to maintain public confidence. It will be important in the years ahead to build upon lessons learned from the experience gained following the demands of and response to the Fukushima accident both within and between the Nordic countries.

Issues related to decommissioning of nuclear installations will require increased attention in years to come. In this process, radioactive waste will be generated and in some cases releases of radioactivity may occur.

During the last 30 years or so, a significant amount of experience and knowledge regarding consequences of radioactive discharges, fallout and environmental radioactivity have been gained. The research has to a large extent focused on the behaviour of a few important radionuclides. This competence and knowledge must be maintained and further developed to include a wider range of relevant radionuclides.

In the past, radiation protection criteria were developed only for humans, and it was assumed that by protecting man, other species would be protected to an acceptable degree. In recent years several problems have been identified with this existing tenet, with the result that systems for protection of flora and fauna, per se, are being developed and tested. Several knowledge gaps relating to this have already been identified, especially with regard to radionuclide uptake, transfer and biological response indicators. Furthermore, there is a need to obtain more experience in the practical application of environmental protection frameworks in typical Nordic environments.

Since 2004, uranium prices have increased sharply, leading to a higher interest in uranium prospecting, and also thorium, in several Nordic countries. Mining and milling for uranium and thorium, and also some other metals, give rise to waste rock and tailings with enhanced concentrations of radioactive substances from the natural series, and there is public concern about the radiation safety and environmental contamination. A wide range of monitoring and measurement techniques will be needed for the risk assessments.

Examples of possible NKS-B activities

E: Emergency Preparedness (in general, as well as specific tools)

- Nuclear and radioecological emergencies and incidents causing public concern: lessons learned and implications for emergency preparedness
- Potential malicious uses of radioactive substances: security, assessments and emergency response
- Exercises and harmonization of activities
- Dose assessments and biodosimetry
- Countermeasures: effectiveness and practicability
- Information and communication: further development of systems and methods
- Decision support systems: integration of existing knowledge

M: Measurement Strategy, Technology and Quality Assurance

- Implementation of international standards and regulations in Nordic countries (e.g., foodstuffs, bulk materials)
- Sampling/measurement strategies for contaminated material, - areas, - foodstuffs
- Systems for mobile measurements
- Validation of methods for sampling and preconcentration of radionuclides
- Radionuclide analytical techniques and intercomparisons

R: Radioecological Assessments

- Transport and ecological transfer of radionuclides in terrestrial environments
- Radioactivity in natural produce and foodstuffs produced in contaminated areas: temporal trends and seasonal effects
- Dose assessments from artificial and natural radionuclides
- Radiation effects in biota: studies of reference ecosystems and reference species for Nordic environments
- Case studies at locations with elevated concentrations of radionuclides

- Marine environments of special importance
- Syntheses of earlier radioecological studies of Nordic interest

W: Waste and Discharges

- Waste and discharges from decommissioning activities
- Cost assessments of decontamination measures and remediation
- NORM waste from uranium mining and milling
- Interventions and clean-up operations
- Disposal of radioactive sources

The list of examples given above is not complete, and other proposals that can be associated with any of the four categories above will be considered in the evaluation process. However, more specific priorities regarding subjects to be covered can be given in connection with each annual call for proposals.