General introduction of NKS and a view on the use of measurement techniques in emergency management

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NKS in short

NKS (Nordic Nuclear Safety Research) is a forum for Nordic cooperation and competence in nuclear safety, including emergency preparedness, serving as an umbrella for Nordic initiatives and interests.

NKS runs joint activities of interest to financing organisations and other end users producing seminars, exercises, scientific articles, technical reports and other types of reference material.

Two Programmes running activities: NKS-R (nuclear reactor safety, etc.) and NKS-B (nuclear/radiological emergency preparedness, etc.)

Financing and support comes from Nordic authorities, companies and other organisations.

Results should be practical and directly applicable for use by participating organisations in their decision making processes and information activities.

NKS-B is not just 'B' for 'Beredskab' (I)

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 methods/strategies for contaminated material, - areas, - foodstuffs
- Systems for mobile measurements
- Validation of methods for sampling and preconcentration of radionuclides
- Radionuclide analytical techniques and intercomparisons

NKS-B is not just 'B' for 'Beredskab' (II)

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

Some recent measurement projects

MOBELRAD (2014) and GAMFAC (2015): Measurement exercises in the Belarussian Chernobyl exclusion zone. Field work collaboration experience.

SEMUNARS (2015), NORDUM (2016) and NEXUS (2017): Examination of status and needs for Nordic drone measurements, and field exercises in natural and urban land areas. Experiences with different platforms and detectors.

RAPID-TECH (2016): Automated use of radiochemistry techniques to reduce response time following a contaminating incident. Many potential uses including emergency preparedness.

GAMMASPEC (2017): Seminar on basic to advanced aspects for users with different backgrounds and needs. High-level experts gave talks.

STANDMETHOD (2015): Establishment of Nordic standard radiochemical methods for radionuclides primarily of importance to nuclear industries.

CONCORE (2015+16): Provide common Nordic, scientifically based recommendations for reliable characterisation of NORM contaminated objects.

Why consider ICP for emergency prep.

- Contaminant specific measurements must be made – not possible to optimise recovery of contaminated areas by only dose rates.
- Different types of emergencies have different features – not all can be measured by simple gamma spectrometry. Beta measurement needs may be neglected because of difficult and slow work procedures.
- Several of the key radionuclides of concern for use in malicious dispersion are pure alpha or beta emitters.
- ICP (MS) techniques can give important information on radionuclides that may be difficult to measure in the deposited matrix.
- ICP techniques may give important information on stable elements in the deposited matrix, thus determining the likely future environmental mobility.
- It is important to examine applicability of novel tools for measurement, and ICP methods are becoming widely used (short analysis time).

Call for proposals for NKS-B 2018

NKS warmly welcomes proposals from you for new R&D activities

- Call announced: 1st of September 2017
- Deadline: 16th of October 2017
- Foreseen project start: January 2018
- NKS funding total 3.1 MDKK for each programme (NKS-R and NKS-B)
- Information on www.nks.org