

NKS-B activity 'URBHAND'

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Handbook for Nordic decision support for contaminated inhabited areas

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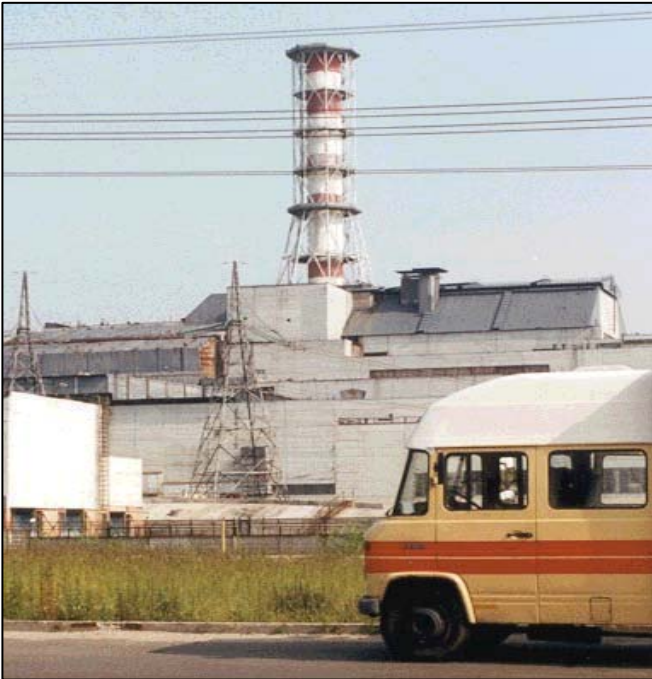
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Handbook Contents


- 1. Introduction** (scope, context, audience, structure, application)
 - 2. Methodologies, systems and equipment for measurement**
(planning of measurements, methods, priority, procedures, training)
 - 3. Countermeasures and implementation strategies** (descriptions of individual countermeasures, formation of strategies)
 - 4. Estimation of doses in a contaminated inhabited area** (look-up tables for different dose contributions under different conditions)
 - 5. Doses and countermeasures for kitchen gardens** (practise in the different Nordic countries, dose examples, cms techniques)
 - 6. Management of waste generated by countermeasures** (wastes from different types of surfaces, repository designs)
 - 7. Legal, social, ethical and communication implications** (social problems, communication and risk perception, ethical principles)
 - 8. Application examples** (NPP accident scenario, 'RDD dispersion')
- **Appendices: datasheets, Nordic emergency management org.**

Development history

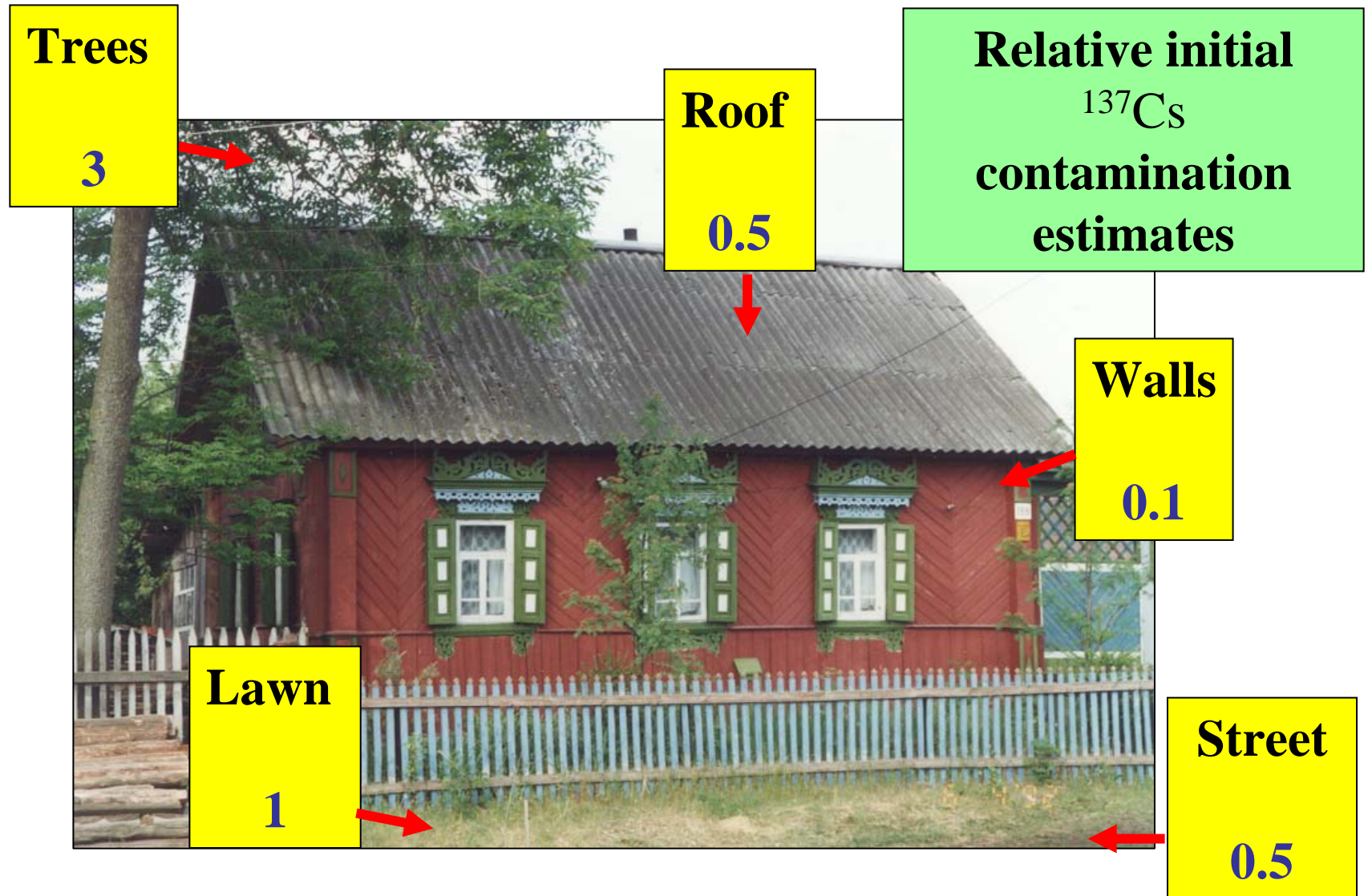


Testing of countermeasures for inhabited areas largely began after the Chernobyl accident

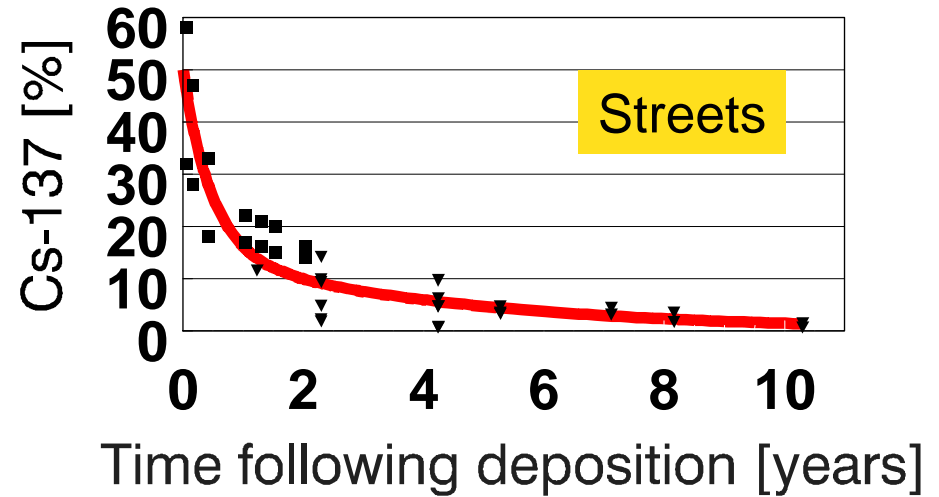
Systematic countermeasure descriptions in datasheets

| | | | |
|--|---|--|---|
| <p>RISØ</p> <p>Practical Methods for Decontamination 9 Years after Chernobyl</p> <p>Editors J. Roed, K.G. Andersson</p> <p>Risø National Laboratory December 1995</p> | <p>nks Nordisk kerne- sikkerheds- forskning</p> <p>EKOS</p> <p>EVALUATION OF ACCIDENT CLEAN-UP RESULTS</p> <p>Kas Risø Re</p> | <p>RISØ</p> <p>Physical Conditions for Acceptable Living Conditions in Contaminated Areas</p> <p>K.G. Andersson, J. Roed, R. Meckbach, D.H. N.A. Beresford and K. Møller</p> <p>Risø National Laboratory January 2003</p> | <p>Radiation Protection Division</p>  <p>RPD-EA-5-2005</p> <p>Countermeasures for the Management of Inhabited Areas Contaminated After a Radiological Incident</p> <p>EURANOS(CAT1)-TN(05)-04</p> <p>J Brown, KG Andersson and KT Mortimer</p> <p>Restricted – Commercial</p> <p>Contract Report</p> |
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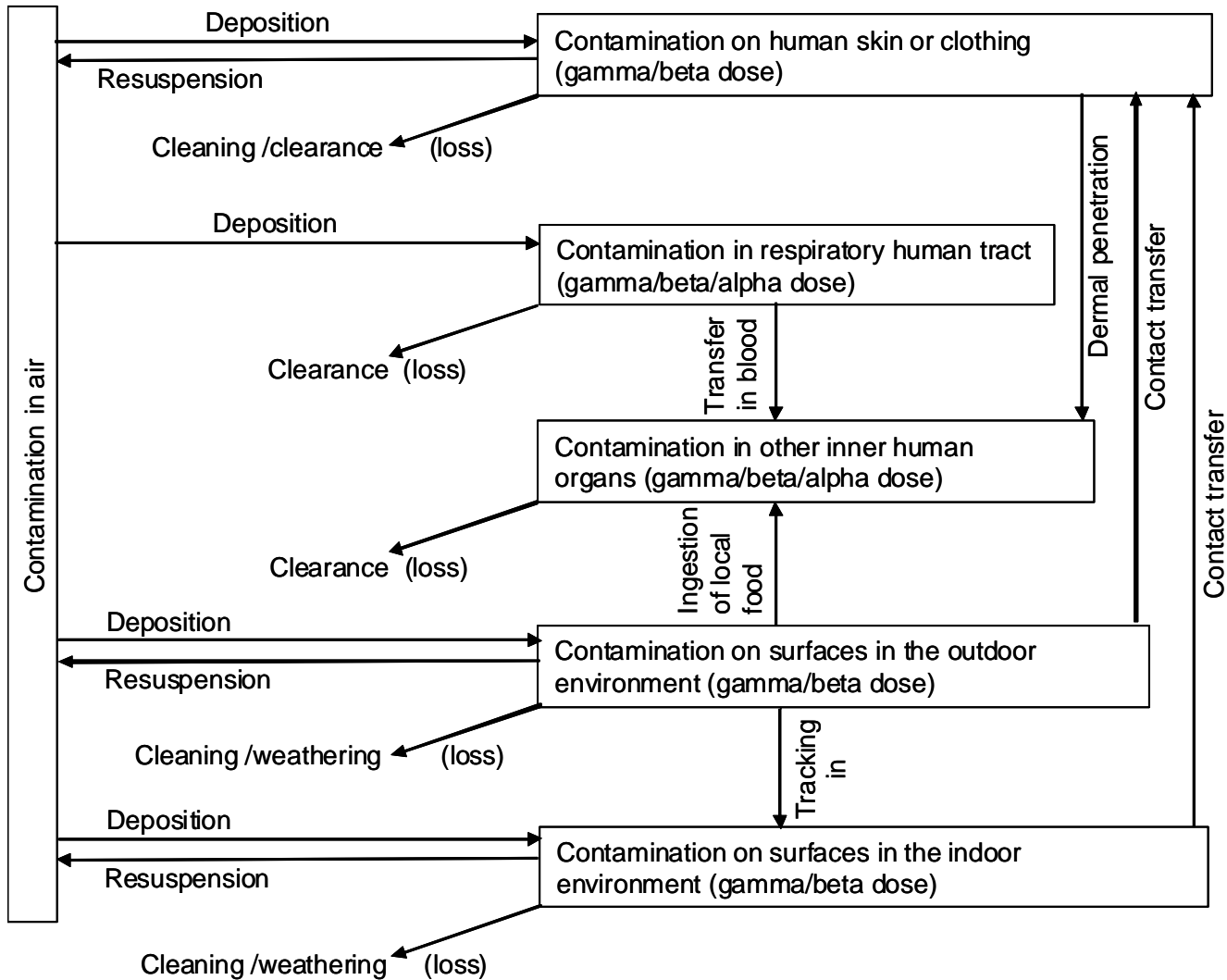
Knowledge about contaminant deposition mechanisms



Various other important experiences



Contamination pathways considered in the handbook



URBHAND Exercise: test of 'prototype' and basis for tailoring

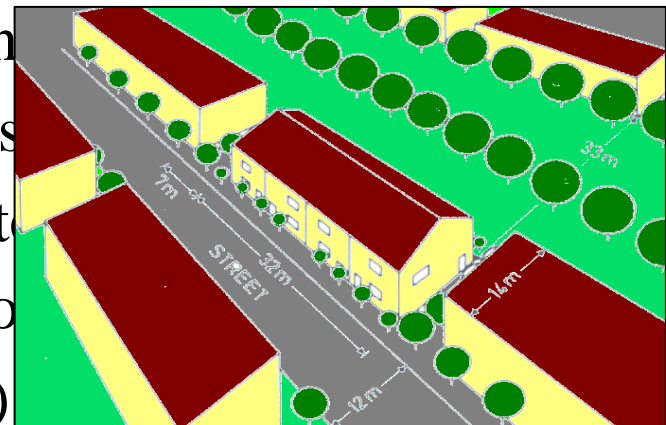
Overall, the handbook was found useful and welcomed by the Nordic end-user representatives

On request, revisions were made, including:

- Revisions to enhance clarity of data tables and reduce likelihood of wrong use of information
- Expanded section on countermeasure justification / optimisation
- Guidance on application of dose methodology for other areas



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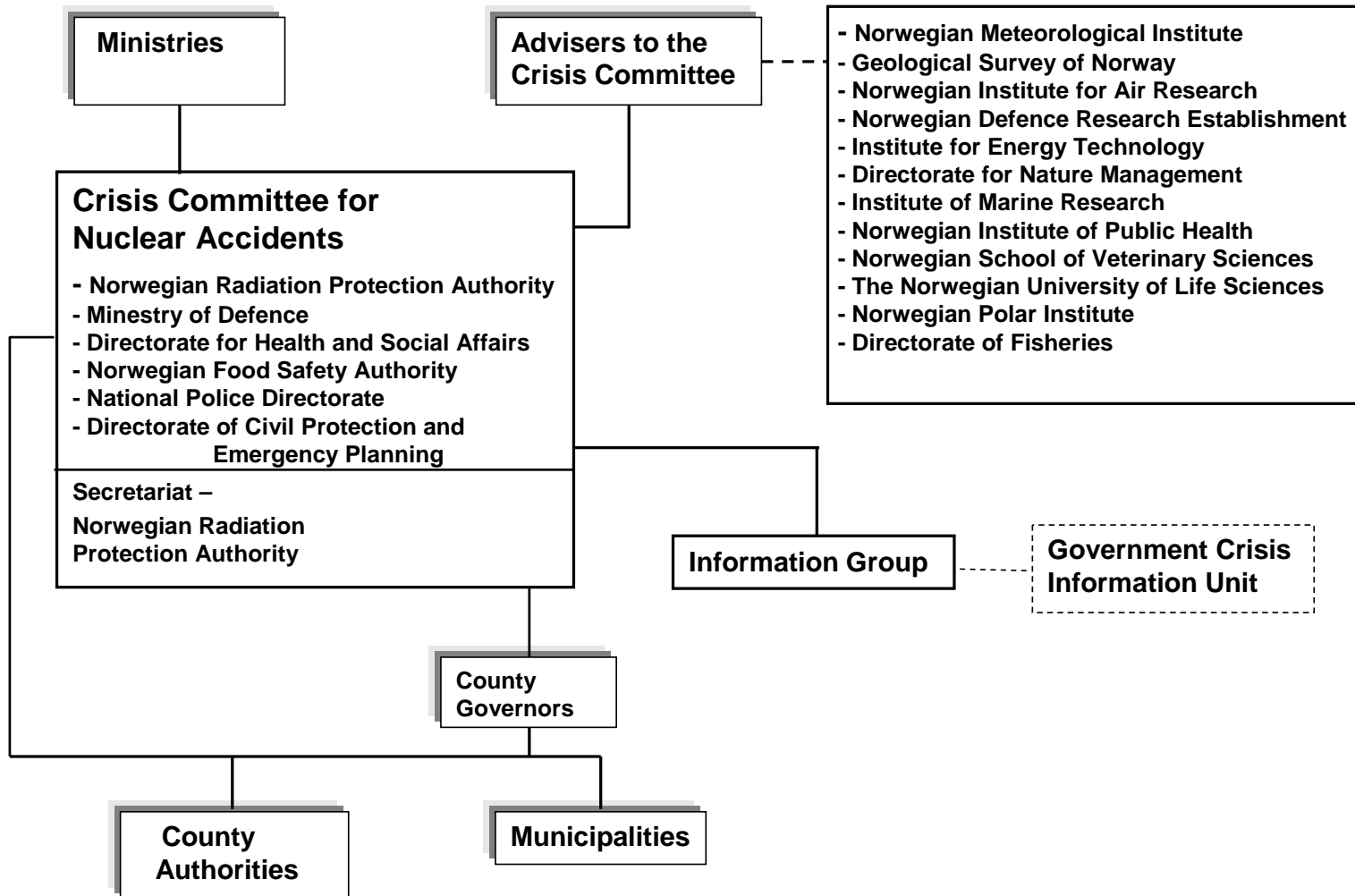
Comparison with EU/EURANOS inhabited areas handbook

URBHAND handbook is targeted on Nordic interests:

- Emergency management structure

Who is responsible for what in the Nordic countries?

Norwegian Nuclear Emergency Response Organisation



Comparison with EU/EURANOS inhabited areas handbook

URBHAND handbook is targeted on Nordic interests:

- Emergency management structure
- Countermeasure selection

17 selected countermeasures described in datasheets



Comparison with EU/EURANOS inhabited areas handbook

URBHAND handbook is targeted on Nordic interests:

- Emergency management structure
- Countermeasure selection
- Less bulky and easier to overview (locally irrelevant info omitted)
- Customised in relation to specific requests of Nordic end-users

URBHAND contains information on kitchen gardens (not in EURANOS)

URBHAND contains information on measurement strategies
(not in EURANOS)

URBHAND contains dose factors that allow rapid assessment of countermeasure effectiveness on a surface (not in EURANOS)

URBHAND has some information relating to consequences of RDD's
(not in EURANOS)

Requirements for full extension for 'dirty bombs'

- Adequate consideration of initial physicochemical forms of produced contaminant particles.

Ceramics: Implications for dispersion/deposition pattern, primary inhalation, resuspension, post-deposition migration, decontamination efficiency. Typically 2-40% aerosolised

Metals: Very little cobalt (<0.2 %) aerosolised

- Consideration of dose factors for more radionuclides, including pure alpha and beta emitters.

Liquids: Formation of (slightly) submicronaceous particles after evaporation,

- A targeted methodology for calculation of doses from deposition of contaminants on humans,

depending on construction. Almost full aerosolisation is possible.

- Social, ethical, communication and economical perspectives would be likely to be very different due to, e.g., affected area size, different time phases, the purposely malicious element.



Conclusions

An NKS handbook dealing with contaminated inhabited areas has been created through an iterative end-user consultation process, which is in a number of ways specially designed for Nordic areas and complementary to the European EURANOS handbook.

The handbook is linked to the European site www.eu-neris.net as an example of area-specific targeting and customisation of generic data for decision support.

Some important information needs to be considered in relation to other types of events than NPP accidents.

- work is ongoing in the ARGOS consortium to address this.
- needs further consideration and comprehensive studies, also for handbook recommendation material.