

# **Crisis Management and Decision support (CMD)**

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## Overview

Radiation protection (ICRP) Exposures related to emergency situations

Planned & existing exposure situations

CMD = research and services in

- Off-site nuclear and radiological emergencies:
  - Monitoring projects
  - Radiological assessments (atmospheric dose and dispersion models)
  - Comprehensive decision support & training activities
  - Integrated emergency management
- Not limited to (off-site) emergencies
  - Specific environmental monitoring
  - Modelling and impact assessment routine releases
  - Reducing releases







#### **Examples:**

- Correlation between enhanced radiation levels and metal contamination for remediation campaigns
- Zero-radiologique
- Participation in nuclear emergency exercises with AGS equipment

- Characterizations and GPS coupling of large volume spectroscopic detectors for measurement of large scale contaminations/detection of sources
  - Development of own equipment
  - AGS (Aerial gamma spectrometry) equipment in the context of the federal nuclear emergency plan
- Monitoring strategy & interpretation
- Environmental monitoring programs
- Use of Geographical Information Systems (GIS) to combine measurement data with geographical data
- Meteorological data: meteorological mast of SCK•CEN





Increased radioactivity levels by use of NORM material In road construction

## Monitoring: examples

#### Zero-radiologique

- 13 km
- 2300 doserate values (<100 nSv/h)
- around 23.8 ha
- around 1 value/6 m along the track
- around 1 value/100 m<sup>2</sup>.





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#### **Examples:**

- Radiological expertise (CELEVAL)
- Development of models for Belgian nuclear operators (NPP's, own installations ...)
- Impact assessment of routine releases
- Study reduction of noble gas releases

## Radiological assessments

- Study of accident scenarios and malevolent use of radiation sources
- Development of atmospheric dose and dispersion models for emergency situations
  - Noodplan
  - Rules of thumb
- Use of advanced dispersion models
  - Numerical weather prediction data
  - Rain-radar data
- Uncertainty analysis: model intercomparison
- Development and use of models for routine atmospheric releases/ reduction of releases



## Atmospheric modelling (examples)

Emergency exercises: e.g. simulation of measurement results



#### Human dose assessment from routine releases of different installations





 Tihange

 average deposistion

 (iodia) Bq/y.m²

 < 10</td>

 10 to 20

 20 to 50

 50 to 100

 100 to 200

 200 to 500

 500 to 1000

 500 to 1000

 > 1000

Atmospheric dispersion calculations for impact assessment on nonhuman biota



## Comprehensive decision support & training activities



#### **Examples:**

- Development of tools for the evaluation of countermeasures
- Development of tools for positioning early warning equipment (Detect)
- International training course on Preparedness and response for nuclear or radiological emergencies

- Integration of radiological assessments into multidisciplinary decision framework
- Use of nuclear and radiological decision support systems (RODOS ...)
- Organization of trainings in the field of nuclear emergencies (NST-CMD)
- Setting up training exercises



## Integrated emergency management



#### **Examples:**

- TMT handbook
- Development of standard response scenario's for intervention teams
- Large scale exercise Doel 2009

- Coordination of/participation in integrated research projects
  - Nuclear incidents as well as security issues
- Stakeholder involvement in emergency preparedness (with NST)
- Methodological guidance of emergency exercises
- Public acceptance of emergency countermeasures (with NST)
- Long-term phase in emergency management



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