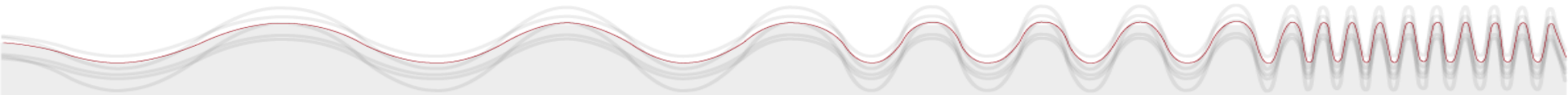


Dimensioning of Norwegian nuclear and radiological emergency preparedness and crisis management



Øyvind Gjølme Selnæs, Norwegian Radiation Protection Authority

NSFS Conference 2011, Reykjavík, August 22nd – 25th 2011

Analysis of nuclear emergency preparedness

Phase 1: Assessment of nuclear or radiological hazards

Scenarios and consequences

Report published in 2008

Phase 2: Follow-up

Adequate management of incidents

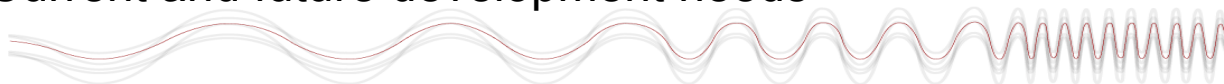
Current and future needs

Report to be published in 2011



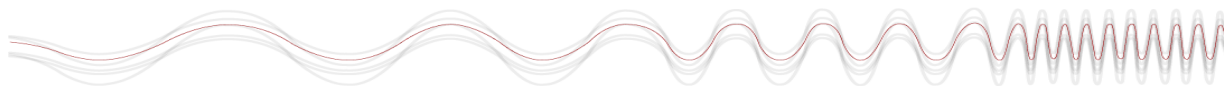
Defining adequate emergency preparedness

- Roles and responsibilities
 - Review and clarification of roles and responsibilities of authorities involved in nuclear emergency preparedness
 - Relationship between authorities
- Dimensioning of Norwegian nuclear and radiological preparedness and crisis management
- Emergency management timeline and nuclear emergency phases
 - Adopting OECD/NEA's description of a general nuclear emergency management timeline
- Necessary management
 - Defines and categorises different actions related to situation understanding, consequence-reducing measures and information management
- Current and future development needs



Dimensioning of Norwegian nuclear and radiological emergency preparedness and crisis management

- In March 2010, the Norwegian Government decided on six general and qualitative scenarios
- The scenarios are based on experience from previous events and assessments of current or future activities
- Each scenario represents distinct aspect to crisis management
- Actual events may easily fall into more than one of these general scenarios



Six general scenarios (part 1 of 2)

I. Large airborne release from a foreign radiological or nuclear facility reaching Norway and affecting larger or smaller parts of the country

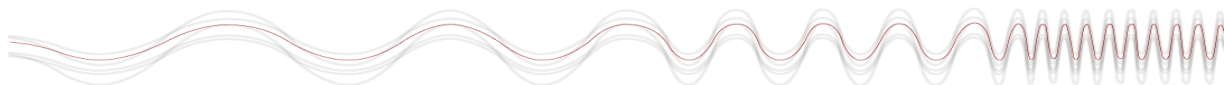
E.g. Chernobyl 1986, or large releases from foreign NPPs, reprocessing plants or large SNF storages

II. Large airborne release from a domestic radiological or nuclear facility

E.g. large releases from research reactors, nuclear-powered vessels at or nearby Norwegian harbours, or fire or similar at facility with large source

III. Local incident without relation to specific sites

E.g. incidents related to nuclear-powered vessels along the Norwegian coastline or transportation of significant radioactive material, crash of satellite with radioactive material or incidents with orphan sources



Six general scenarios (part 2 of 2)

IV. Local incident evolving over time

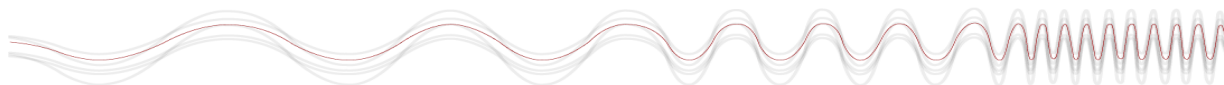
E.g. Goiânia (Brasil) 1987, Mayapuri (India) 2010, poisoning of Litvinenko in London 2006, long-term releases from facilities or incidents with orphan sources

V. Large release to Norwegian marine environment or marine environment close to Norway, or a rumour or suspicion of considerable marine or terrestrial contamination

E.g. incidents with nuclear-powered vessels or transportation of significant radioactive material, smaller or larger releases, reputation damage

VI. Severe incident abroad without direct consequences for Norwegian territory

E.g. Fukushima 2011, local incidents abroad, use of nuclear weapons in some regions not affecting Norwegian territory



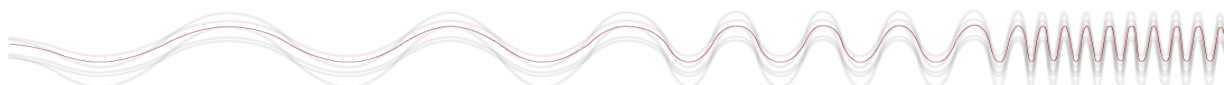
Terrorism/criminal actions, nuclear weapons

Terrorism or other criminal actions

- The risk of terrorism or other criminal actions using radioactive materials or directed towards nuclear facilities cannot be disregarded. However, the probability is considered to be low.
- Norwegian authorities should be prepared for terrorism or criminal actions abroad that will affect Norwegian citizens.
- The largest challenges will be related to mapping affected people, criminal investigation, information management and on-site restoration

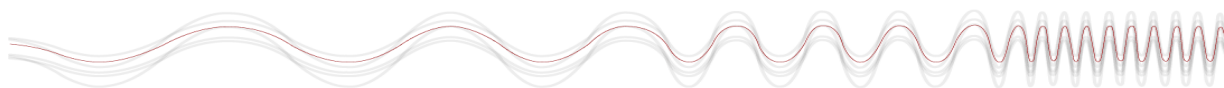
Nuclear weapons

- Use of nuclear weapons against Norway today is considered to be very unlikely.
- The risk of use of nuclear weapons will not be emphasised in the future development of the national nuclear emergency preparedness.
- However, there is less unlikely that nuclear weapons may be used in some regions abroad in the future, and thus may affect Norwegian citizens or interests locally.



Relevant consequence-reducing measures

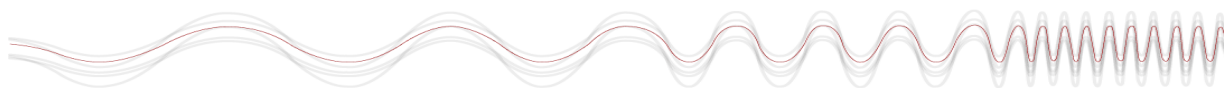
Consequence-reducing measures	Scenario I Large airborne release from foreign nuclear facility					Scenario II Large airborne release from domestic facility					Scenario III Local incident without relation to specific sites					Scenario IV Local incident evolving over time					Scenario V Large marine release or rumour of large release					Scenario VI Severe incident abroad without direct national consequences				
	→					→					→					→					→									
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Incident site management						X	X				X	X																		
Securing of areas that are or may be highly contaminated							X	X				X	X				X	X												
Decontamination of members of the public						X	X				X	X																		
Indoors staying		X				X	X				X	X															X			
Evacuation of local communities		X	X			X	X	X			X	X	X				X	X									X	X		
Intake of stable iodine		X				X	X					X															X			
Temporary stay in public shelters												X																		
Follow-up by health care services			X	X	X	X	X	X	X		X	X	X	X		X	X	X	X								X	X	X	X
Short-term measures regarding food production		X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X								
Dietary advice		X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X					X	X	X	
Other consequence-reducing measures		X	X	X	X	X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X			X	X	X	X



Relevant actions related to situation understanding

Actions related to situation understanding	Scenario I Large airborne release from foreign nuclear facility					Scenario II Large airborne release from domestic facility					Scenario III Local incident without relation to specific sites					Scenario IV Local incident evolving over time					Scenario V Large marine release or rumour of large release					Scenario VI Severe incident abroad without direct national consequences				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Receiving and handling of alerts	X					X					X					X					X					X				
Information gathering	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Visual surveillance	X	X				X	X				X	X									X	X				X	X			
On-site field measurements						X	X				X	X																		
Off-site field measurements, orphan source searches or deposition mapping		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X				X	X		
Sampling, analysis and monitoring of environment and biota		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X							
Sampling, analysis and monitoring of food stuffs and animal health		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X	X							
Sampling, analysis and monitoring of members of the public		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X							X	X		

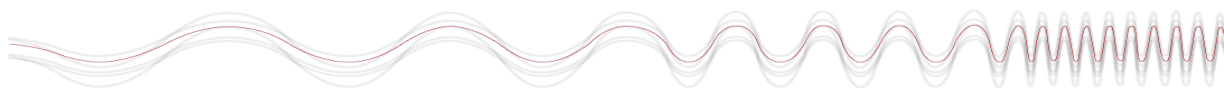
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Relevant actions related to situation understanding (cont.)

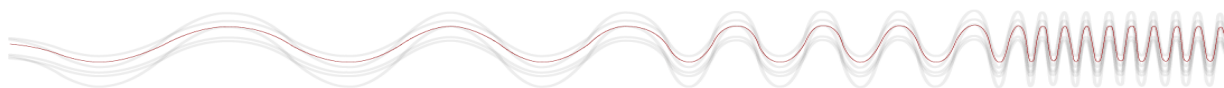
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Actions related to situation understanding	Scenario I Large airborne release from foreign nuclear facility					Scenario II Large airborne release from domestic facility					Scenario III Local incident without relation to specific sites					Scenario IV Local incident evolving over time					Scenario V Large marine release or rumour of large release					Scenario VI Severe incident abroad without direct national consequences									
	→					→					→					→					→														
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5					
Automatic monitoring networks	X	X	X			X	X	X			X	X	X			X	X	X													X	X	X		
Weather and dispersion prognoses, deposition prognoses	X	X				X	X				X	X				X	X				X	X				X	X				X	X			
Assessment of health-related consequences		X	X	X	X		X	X	X	X		X	X	X	X		X	X	X	X		X						X	X				X	X	
Assessment of environmental or other societal consequences		X	X				X	X				X	X				X	X				X	X					X	X				X	X	
Coordinated situation understanding, reporting	X	X	X			X	X	X			X	X	X			X	X	X			X	X	X			X	X	X			X	X	X		



Summary

- The six scenarios are general and qualitative in nature and describes events with different types of consequences, each representing distinct aspects towards crisis management
- They raise consciousness on different needs in different situations and provide a common understanding of appropriate actions during a nuclear or radiological emergency
- They provide a basis for prioritising needs and planning future development of nuclear or radiological emergency preparedness



Thank you for your attention

