Minimizing the radiation exposure risk of first responders during emergency situation management

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Bundesamt für Strahlenschutz

Talk structure

- Short introduction to the infrastructure of defence against nuclear hazards in Germany
- The role of the central support group of the German federal government (ZUB)
- The role of the German Federal Office for Radiation Protection within the ZUB
- Radiation protection strategy – general points
- Lessons learned from Hamburg deployment – perceived versus actual harm.
- Training and education of ZUB staff
- Summary and comments

BfS is called upon for the defence against nuclear hazards when…

- the loss or discovery of radioactive material or the suspicion of a crime involving radioactive material is reported.
- serious danger to life, health and possession is feared.
- the local authority in charge (Bundesland) cannot undertake the tasks itself, due to limited resources, or only with great difficulty.

→ Authority in charge (Bundesland) requests support from the federal government.

German federal structure

- 16 German federal states (Bundesländer)
- Each state has police and a radiation protection authority
- Most incidents are handled without intervention of the federal government
- State authorities remain in charge throughout, but can call on support by the ZUB.

BKA

BPOL
Bundespolizei

Bundesamt für Strahlenschutz

The central support group of the German federal government for serious incidents involving the defence against nuclear hazards (ZUB)

The role of the German Federal Office for Radiation Protection in the ZUB

- Advising policy-makers in all aspects of radioactivity (medical, protective measures, transport, press, etc.)
- Detection of radioactive material, radionuclide determination, the estimation of activity levels and contamination measurements.
- Evaluation of radioactive materials and criticality risks.
- Estimation of radiological consequences following a detonation/dispersion and radioactivity predictions.

Radiation protection strategy – general points (1)

- Difficult to anticipate what the deployment scenario will be, however, the operational structures in the ZUB can support the ALARA principle.
- The BfS conducts the radiological evaluation of every deployment situation in real time.
- BfS measurement units deployed in the field to give the best possible dose estimates.
- Senior radiation protection advisors on-hand to advise the operations leader in the control centre at all times.

Radiation protection strategy – general points (2)

- Dose limit for the public/first responders who do not routinely work with radioactive materials: 1 mSv.
- Dose limit for first responders who do routinely work with radioactive materials: 20 mSv per year.
- Electronic and film dose meters.
- The goal is as low a radiation dose as reasonably attainable under deployment conditions.

Radiation protection strategy – general points (3)

- In order to save lives and/or prevent serious harm to people and/or prevent catastrophic events developing, an exceptional radiation dose of up to 250 mSv (once only) or 100 mSv (per year) is permitted, but only with consent (education necessary).
- NB: by the time the ZUB is deployed, radiation doses over these limits may have already been received by the public and/or first responders. In this case, the BfS can advise on appropriate medical measures.

Lessons learned from Hamburg deployment – perceived versus actual harm.

- The deployment was successful and the communication in general was successful.

- However, the common difficulty of separating the perceived from the actual risk or harm caused by the Po-210 was felt in three areas of communication:

  - Internal (different organisations working together)
  - External (press conferences)
  - Discrepancies between internal and external sources

Internal communication

Inappropriate protective clothing for picking up the family from the hotel

Inappropriate choice of vehicle for the transport of the family to a routine check-up

➢ **The family involved lost trust in the emergency workers**

External communication

Hamburg, 07.12.2006

Hamburg, 08.12.2006

Two press conferences were held. These were meant to reassure the public that there was no danger to them or any member of the emergency services at the scenes…

External communication

…however, the press encouraged their readership to believe that the counter measures were not simply precautionary.

➢ **Anxiety among the public and the emergency workers**

Discrepancies between the internal and external sources of information

- Some police officers were contacted from home with additional and/or misleading information taken from media sources before the deployment.

➢ **Heightened anxiety within the police force during the operation.**

- Several “worried well” from the police service and their families demanded health checks after the deployment, even though none had been inside the scenes involved.

➢ **Strain on health physics resources.**

Lessons learned from Hamburg deployment – perceived versus actual harm (1).

- The consequences of poor communication during a deployment are at the very least a loss of trust of the public and emergency responders, heightened anxiety and strains on health physics resources.
- In the worst case, poor communication of the radiation protection measures to be undertaken could lead to loss of life.
- Effective communication is vital to ensure the ALARA principle is followed during a deployment.

Lessons learned from Hamburg deployment – perceived versus actual harm (2).

- A new ZUB communication strategy has been put in place that emphasises a customised, homogeneous and appropriate (made-to-measure) response.
- The strategy includes information material for pre-deployment briefings and information cards for first responders and the public.
- An emphasis is put on routine education and training of ZUB first responders in radiation protection.

Training and education of ZUB staff

- Lecture-based education on radiation protection for all non-BfS ZUB staff.
- Multitude of bilateral exercises and training, for example crime scene exercises, overt searches and covert searches (“hands-on”).
- Every year there is a full ZUB exercise together with a different Bundesland. Includes the important topics of communication and radiation protection.

Summary and comments

- Minimizing the radiation exposure risk during emergency situation management due to malevolent acts is a large task that involves a lot of preparation and planning.
- Radiation protection not only has to be ensured, but also effectively communicated.
- Communication should be treated as vital to the success of a deployment.
- Routine radiation protection education of non-expert staff and pre-prepared information material could possibly prevent some communication problems during a deployment.

Thank you for your attention

Questions?

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