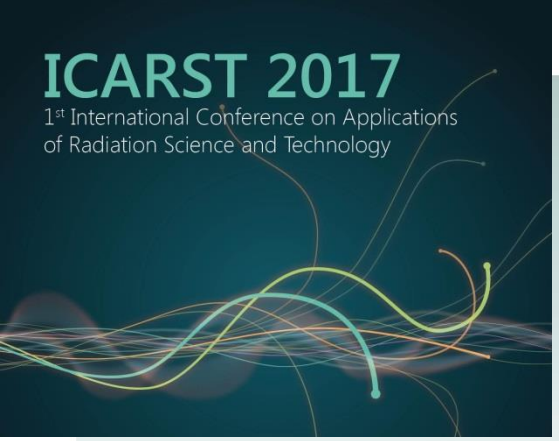

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Upgrading safety and security of gamma irradiation facilities – possibilities and limitations

Speaker:
Manfred Frenzel

Overview

- General
- Factors influencing safety and security
- Upgrading - Possibilities and limitations
- Security
- Makes me headache

General
Safety / Security

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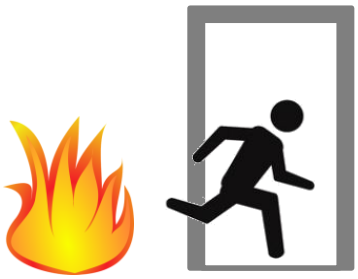
Safety

Protect people from hazards



Security

Protect the facility from attacks by (bad) people

Sometimes contradicting requirements

Safety: Unhampered escape route for staff members

Security: No access from outside

General

A gamma irradiation facility seen in Asia (several years ago):

Access control to the irradiation room consisted of a simple chain and a red warning light only.

- No locked access door
- No light barrier
- No step plate
- No mechanical or electrical interlock with the source hoisting system

Factors influencing safety and security

What factors do influence safety and security?

- Technical factors (self-acting or to be used deliberately)
  - Interlock of access and of source hoisting system
  - Burglar alarm system
  - Personal dosimeters
- Organizational factors
  - Education and training of staff
  - Working and safety instructions
- SAFETY/SECURITY CULTURE
  - General attitude and behavior with respect to safety and security

Factors influencing safety and security

Under control of the facility management

Technical factors

Organizational factors

Under "control" of the public

Safety/Security culture

Upgrading - Possibilities and Limitations

Upgrading technical factors

Simply follow existing recommendations, standards, rules (IAEA, international, national)

Easier said than done!

- Lack of funds
- Lack of education or knowledge
- Lack of safety and security culture

What can be done?

Is it part of the mission of the Agency to take care of such lacks (asked or unasked)?

Upgrading - Possibilities and Limitations

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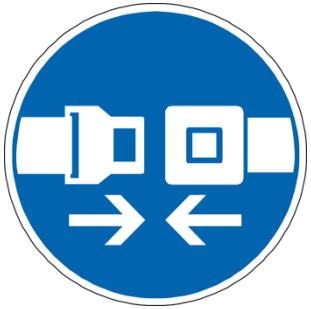
Upgrading organizational factors

Simply follow existing recommendations, standards, rules (IAEA, international, national)

Easier said than done!

- Lack of knowledge
- Lack of safety and security culture (willingness to follow instructions)
  - Use of safety belts in cars
  - Stop at red traffic lights
  - Obey speed limits
- (Lack of funds)



Upgrading - Possibilities and Limitations
SAFETY CULTURE

What is it?

What is it?

Worksite power distribution

Upgrading - Possibilities and Limitations
SAFETY CULTURE

What may be the reasons?

- Fast developing industry – industry grows faster than development of regulations
- Insufficient enforcement of safety regulations in daily life (street traffic, electrical safety, …)
- It is “normal” not to obey regulations
  - Comparable to a kind of carelessness regarding cleanness (e. g. throwing rubbish out of the moving car)
  - Different cultural background at different places of the world

Upgrading - Possibilities and Limitations
SAFETY CULTURE

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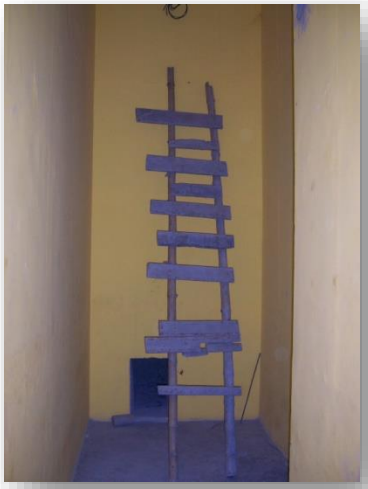
Improvement of safety culture (at least in a GIF)

- Education of staff to understand threats
- Provide positive examples of high safety culture
- Exchange of staff to demonstrate that a high safety culture must (and can) be the normal case



Security

Possible targets of attacks

- Destroy or damage the facility to spread fear
- Theft of radioactive sources to abuse them for terroristic purposes

Intrinsic security against theft of radioactive sources?

- Access to the facility
- Tools for source handling → can be locked
- Shielding container → heavy
- Crane → can be blocked
- Know how (insider knowledge)

Security

However!

Terrorist may be ready to sacrifice his own life (suicide attack) to get a radioactive source for later abuse

- Get access to the facility
- Dive into the pool and grab a source
- Carrying the source out of the facility to a shielding container for further transport

Makes theft simpler

- No or just simple tools for source handling needed
- Shielding container remains outside the facility
- No crane needed

[C. J. Hartwigsen; WINS Workshop; 2016]

Security

Some know how is required

- How to get access to the facility
- Localization and identification of the radioactive sources
- How to handle the source in an “appropriate way”

Possible sources of know how

- Insiders
  - Voluntary
  - Blackmailing
  - Force of arms
- Other

Security

Against intruders

- Early detection of intruders
- Delay of the intruders
- Timely response to stop intruders action before reaching their goal

Against involvement of insiders

- Two-man rule to get access to sensitive areas
- Keeping automatically records of who has done what
- Limitation of rights to the required minimum

Security culture

- Limitation of the communication to outsiders

Makes me headache

Cheap - cheaper - cheapest culture

- Purchase price of a plant is often considered the most important point
  - Rather than quality of the product
  - Rather than cost / benefit ratio
  - Rather than quality of service
  - Rather than safety/security level
- Is it due to the lack of funds?
  - Maybe, in some cases
  - However, most of the investors never would buy the cheapest car they can get

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Thank you !

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