

# The Interface of Safety and Security in the Response to a Malicious Act

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CANADA

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Presented at the

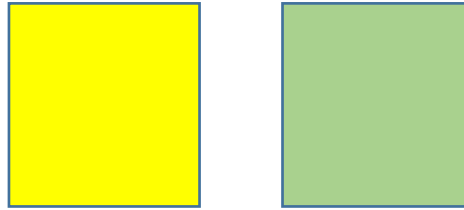
**International Experts Meeting on Assessment and Prognosis in Response to a Nuclear or Radiological Emergency**

20-24 April 2015

IAEA Headquarters, Vienna Austria

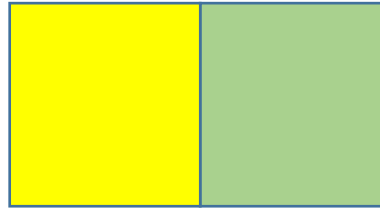
# Progression of the Interface

- Where we were



- Air gap between STEs and Gates, Guards & Guns

- Where we are



- Some level of communication and understanding of roles

- Where we should be



- Completely integrated cross-functional interoperability



# Some Definitions

- (nuclear) safety
  - The achievement of proper *operating conditions*, **prevention** of *accidents* or **mitigation** of *accident* consequences, resulting in **protection** of *workers*, the public and the environment from undue *radiation* hazards.
- (nuclear) security
  - **prevention** and **detection** of, and **response** to, theft, *sabotage*, unauthorized access, illegal transfer or other *malicious* acts involving *nuclear material*, other *radioactive substances* or their associated *facilities*
  - In general, **security** is concerned with *malicious* or negligent actions by humans that could *cause or threaten harm to other humans*; **safety** is concerned with the broader issue of *harm to humans* (or the environment) from *radiation*, whatever the cause.

**Nuclear  
Safety**

**P  
R  
O  
T  
E  
C  
T**

**Nuclear  
Security**

Is there any difference in **assessment process** or objectives if the nuclear/radiological event is a result of a malicious act versus an accident?

- Accident may or may not be initiated by a human, but progresses in a 'semi-predictable' fashion
- Malicious (hostile) act is always driven by humans, and progresses in a generally non-predictable fashion

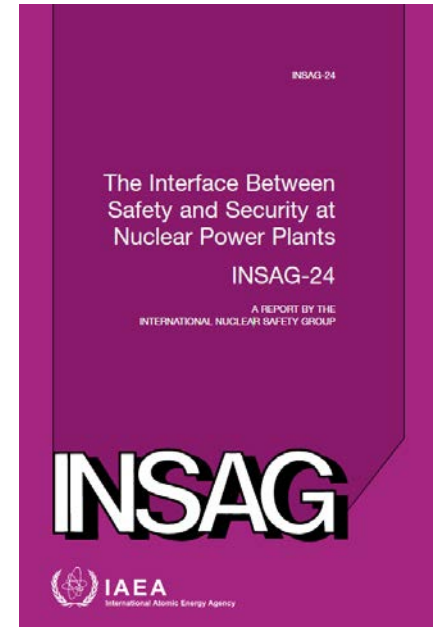


vs.



# What is the interface between the radiological emergency response organization and the security response force?

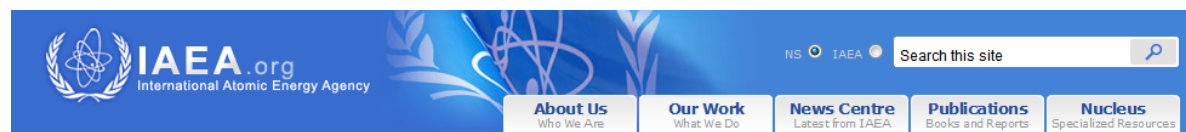
- INSAG-24: 49. The management authority for both safety and security should be centralized in the operator's organization so as to ensure appropriate coordination
- UN NRC: Bulletin 2005-02
  - How emergency classification schemes address security events
  - Timeliness of security event notification
  - Onsite protective action plans
  - Alternate onsite emergency response facilities
  - How emergency preparedness exercises address security events



# Issues to resolve for nuclear/radiological emergency response

- How has the event been assessed?
  - Is an accident really an accident?
- Who takes the lead on the response?
  - Is there a coordination mechanism?
- What are the roles and responsibilities of the different emergency response groups?
  - Has the potential insider threat been addressed?
  - Is there a primary or concurrent cyber/IT threat?
- Have emergency response plans been exercised for security-based events?
  - Nuclear Energy Institute (NEI) has developed some guidance (NEI 06-04)

# Relatively large publication bases



## Nuclear Safety & Security

Nuclear Applications Nuclear Energy **Nuclear Safety & Security** Safeguards Technical Cooperation

- ⬆ Nuclear Safety & Security
  - Safety & Security Framework
  - ▾ Technical Areas
    - ▾ Emergency Preparedness & Response
      - ⬆ Home page
      - International Framework
      - Preparedness**
      - Response
        - Nuclear Installations
        - Radiation Transport & Waste
        - Security
    - Services for Member States
    - Safety & Security Publications
    - Conventions & Codes
    - Education & Training
    - Meetings
    - Special projects

## Publications for first responders

This page lists IAEA publications relevant to first responders.

### Practical IAEA Publications for first responders



#### Manual for first responders to a radiological emergency

*IAEA-EPR-First Responders, 2006*

The objective of this publication is to provide practical guidance for those responding within the first few hours of a radiological emergency. This includes the emergency service personnel who would initially respond at the local level and the national officials who would support this early response. [Details](#)



#### Dangerous Quantities of Radioactive Material (D-Values)

*IAEA-EPR-D-Values, 2006*

A D value is the quantity of radioactive material which is considered a dangerous source. A dangerous source is one that, if uncontrolled, could result in death or a permanent injury which decreases that person's quality of life. Various IAEA documents concerning emergency preparedness and safety and security of radioactive sources list D values for a limited set of radionuclides. This document describes, in detail, the basis for the D-values given in various Agency documents and provides D-values for over 400 radionuclides that may be relevant in the event of a nuclear or radiological emergency. [Details](#)



#### Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency

*IAEA-EPR-METHOD (2003) (Updating IAEA-TECDOC-953)*

This publication provides a practical resource for emergency planning and fulfils, in part, functions assigned to the IAEA in the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. If used effectively, it will help users to develop a capability to adequately respond to a nuclear or radiological emergency. [Details](#)

☐ Generic assessment procedures for determining

### See also

[IAEA Publications website](#)



## Scientific & Technical Publications

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## Nuclear Security Series



#### Security of Nuclear Information...

STI/PUB/1677 (English)  
(ISBN:978-92-0-110614-8)

[Read more](#)



#### Radiological Crime Scene Management...

STI/PUB/1672 (English)  
(ISBN:978-92-0-108714-0)

[Read more](#)



#### Objective and Essential Elements of a State's Nuclear Security Regime Spanish Edition...

STI/PUB/1590 (Spanish)  
(ISBN:978-92-0-307014-0)

[Read more](#)



#### Objective and Essential Elements of a State's Nuclear Security Regime French Edition...

STI/PUB/1590 (French)  
(ISBN:978-92-0-205714-2)

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#### Objective and Essential Elements of a State's Nuclear Security Regime Russian Edition...

STI/PUB/1590 (Russian)  
(ISBN:978-92-0-404814-8)

[Read more](#)



#### Objective and Essential Elements of a State's Nuclear Security Regime Arabic Edition...

STI/PUB/1590 (Arabic)  
(ISBN:978-92-0-606114-5)

[Read more](#)



#### Objective and Essential Elements of a State's Nuclear Security Regime Chinese Edition...

STI/PUB/1590 (Chinese)  
(ISBN:978-92-0-505514-5)

[Read more](#)



#### Nuclear Security Systems and Measures for Major Public Events Russian Edition...

STI/PUB/1546 (Russian)  
(ISBN:978-92-0-401414-3)

[Read more](#)



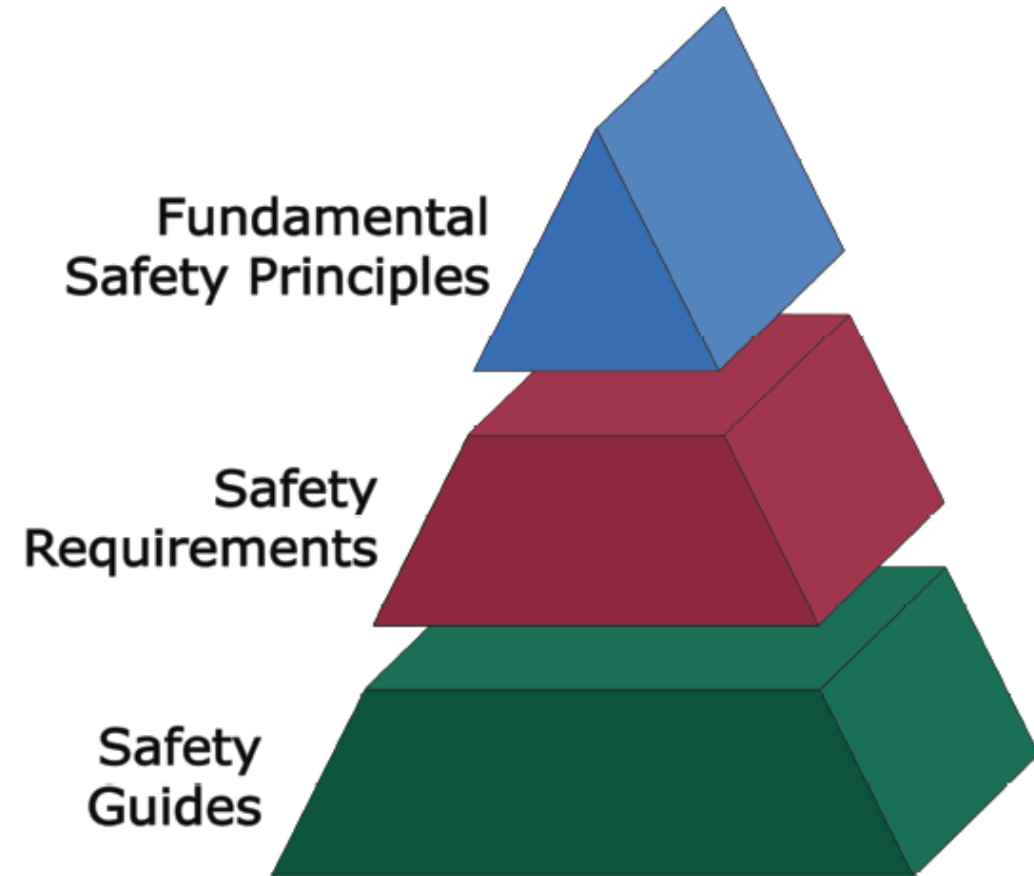
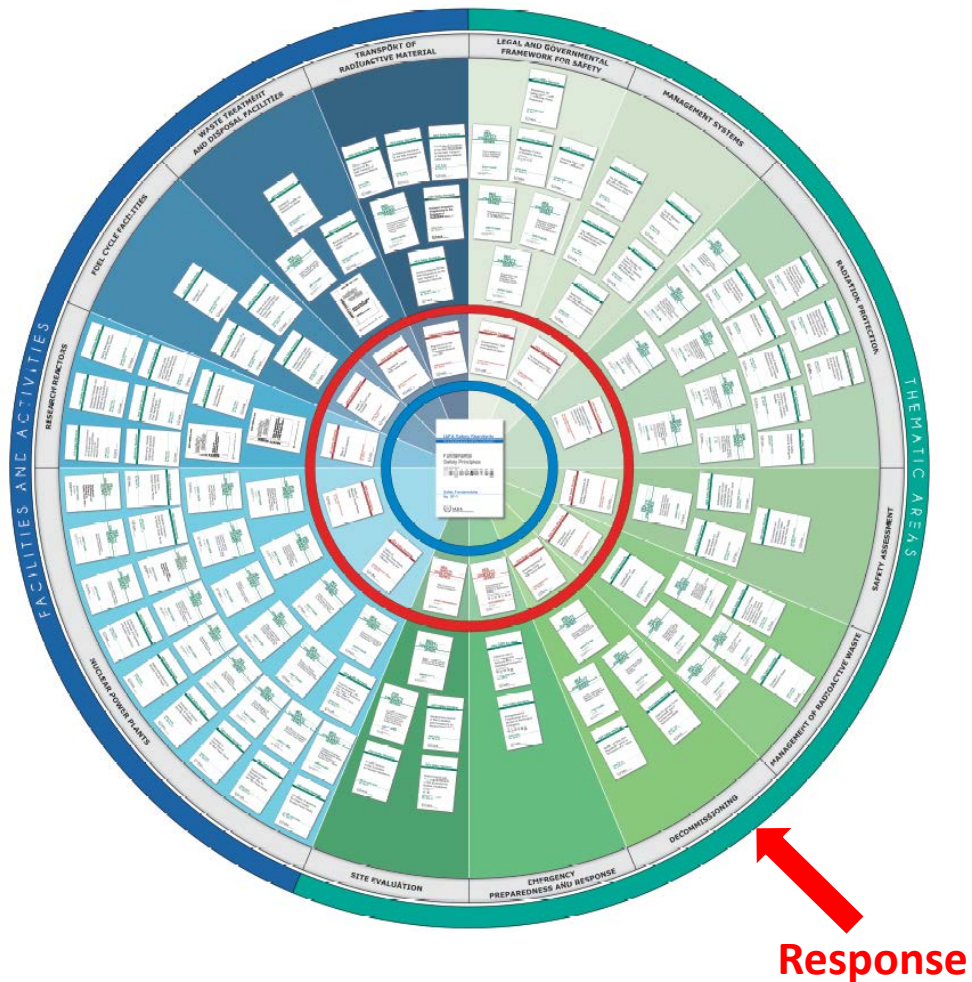
#### Security in the Transport of Radioactive Material Spanish Edition...

STI/PUB/1348 (Spanish)  
(ISBN:978-92-0-344410-1)

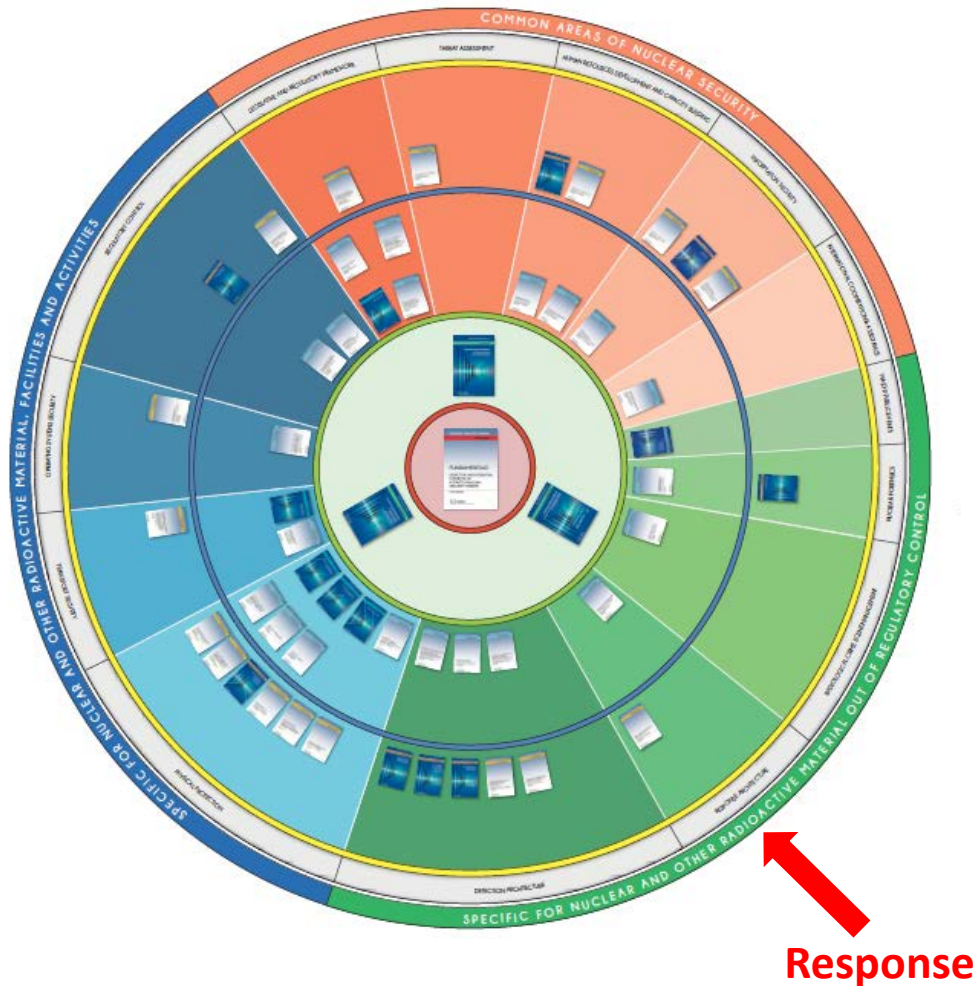
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# Nuclear Safety Series



# Nuclear Security Series



Fundamentals; Objective  
and Essential Elements

Recommendations

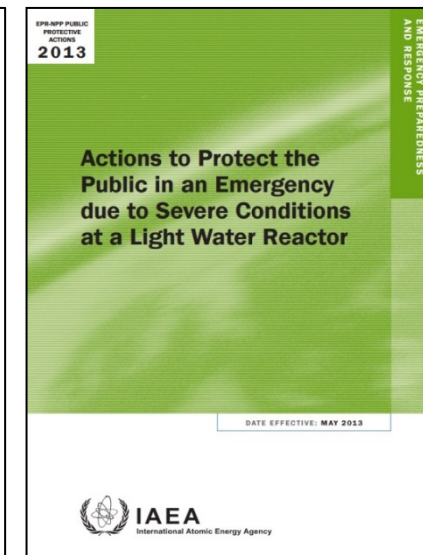
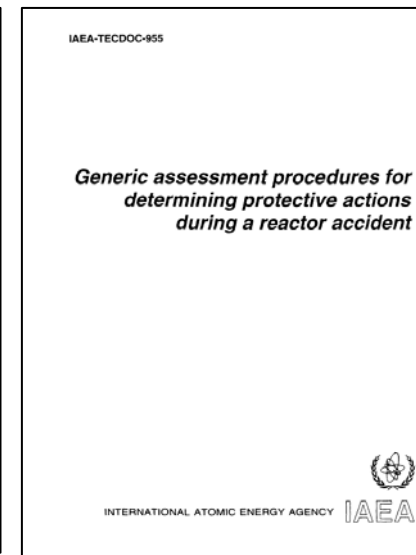
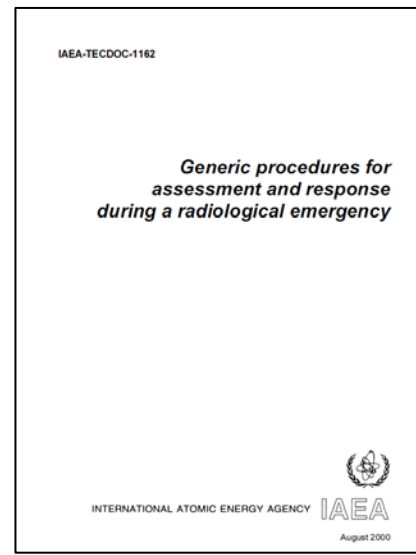
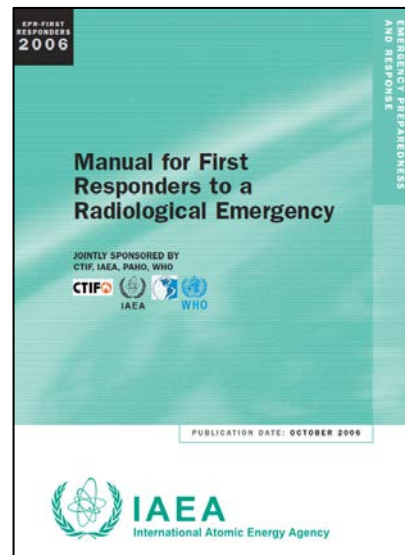
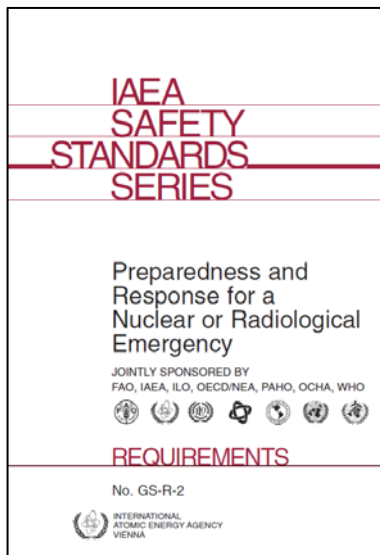
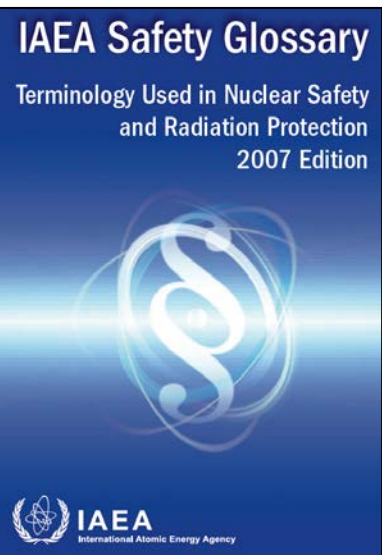
Implementing  
Guides

Technical  
Guidance

**Principles**

**What**

**How**



*Malicious acts are discussed here*

***Implementing and Technical Guidance documents for contingency response are planned***



INTERNATIONAL ATOMIC ENERGY AGENCY  
DIVISION OF NUCLEAR SECURITY

Nuclear Security Series Glossary  
Version 1.1 (May 2014)

**DRAFT**

DRAFT FOR USE BY TECHNICAL OFFICERS AND DRAFTERS  
AND FOR COMMENT

# Conclusions

- The gap has been closing between the safety and security cultures
  - We can do better
- Assessment for emergency response is different for the safety and security organizations
  - The goal is the same
- There have been a variety of emergency response exercises that have involved security events
  - Transparency and sharing of OpEx is not as complete as with safety

# Recommendations

1. Completion of the **Nuclear Security Series Glossary**
2. Development of **security response guidance**, similar to and consistent with IAEA Emergency Preparedness and Response guidance
  - Planning and Preparedness for Response to Nuclear Security Events – Implementing Guide
  - Recovery of Radioactive Material Out of Regulatory Control – Technical Guidance
3. Development of guidance for implementing a **coordinated response mechanism**
4. Development of coordinated **drill and exercise guidance** for coupled safety & security events
5. Development of guidance for fostering **synergy** of contingency (security) plans and emergency (safety) plans



# Recommendations (cont)

## 6. Continued promotion of:

- **Cross functional communications:** Need to know versus need to share
- **Security Liaisons** (from safety departments)
- **Security-informed Safety Management:** safety personnel given specialized training in nuclear security
- **Human reliability:** establishment of high standards of individual integrity in personnel performing duties associated with the nuclear assets being protected
- Exercising the **insider threat**
- Exercising **IT/cybersecurity** events
- Security-based **event tree** development to aid security response plan development
- Completely integrated cross-functional interoperability



# Questions?

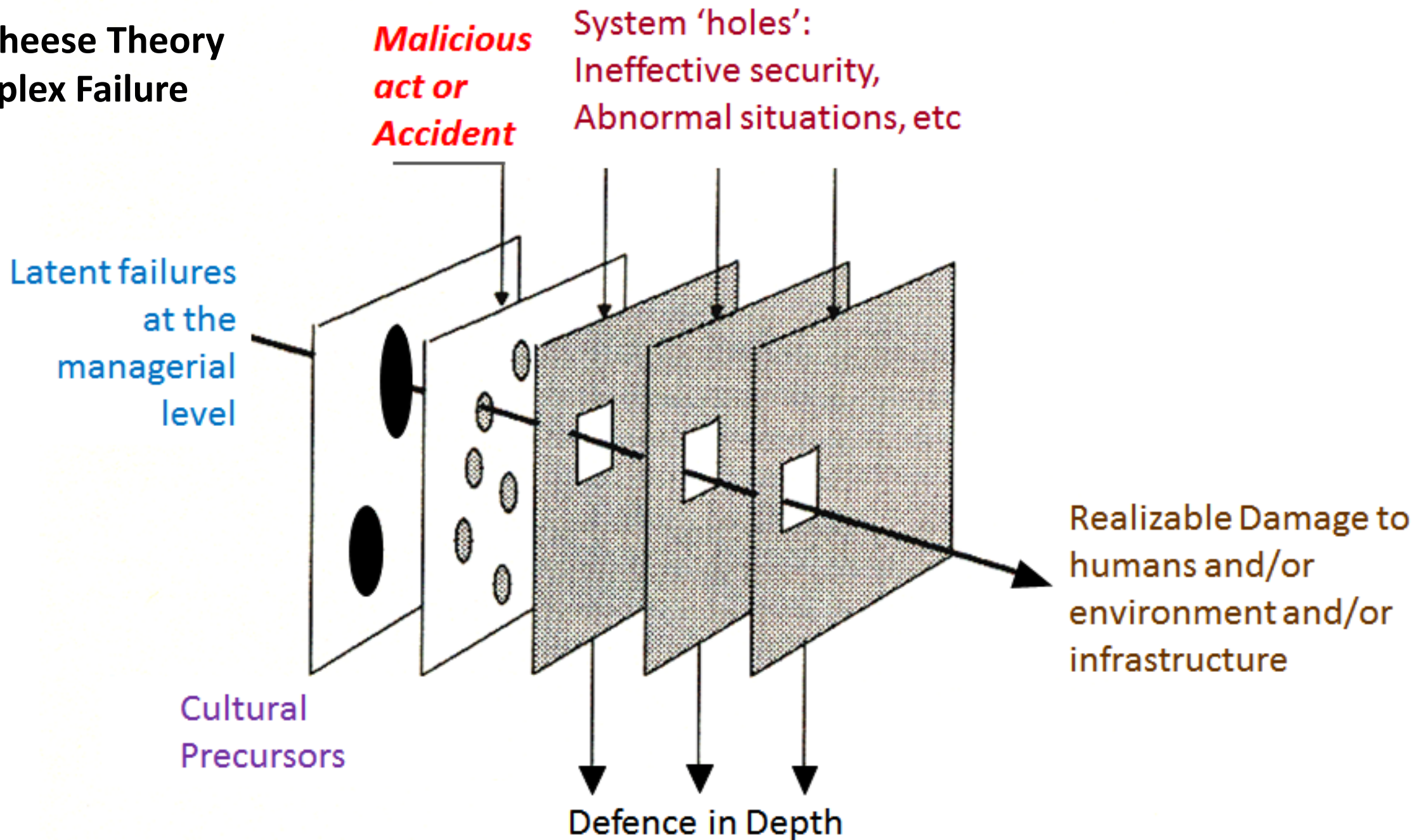
**Vision without Execution is Hallucination**

*Thomas Edison*





# Swiss Cheese Theory of Complex Failure



# Is there consistent lingo?

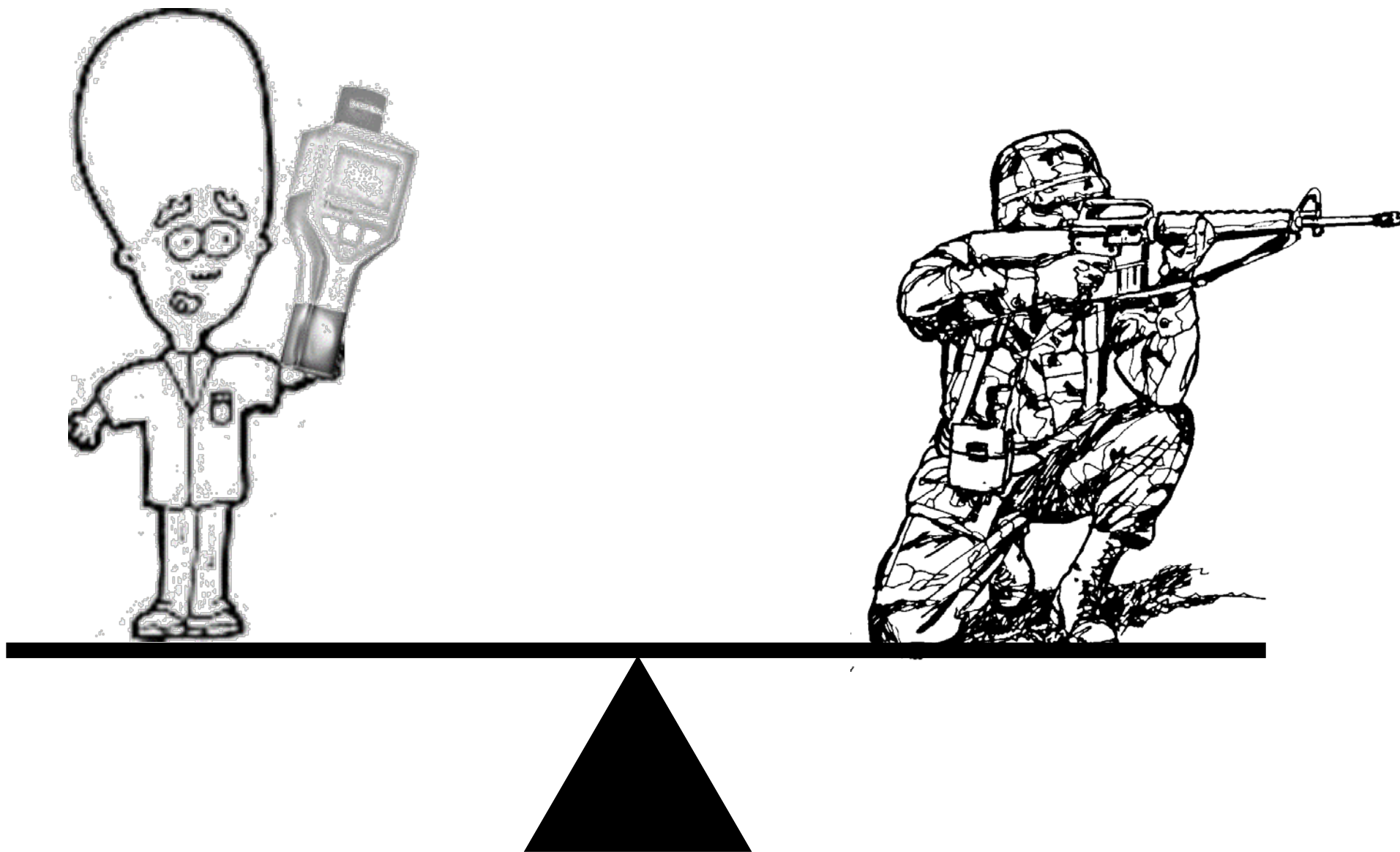
- Is there a common definition of “Emergency Response”?
  - The **performance of actions to mitigate the consequences** of an *emergency* for human health and *safety*, quality of life, property and the environment. It may also provide a basis for the resumption of normal social and economic activity.
- *Emergency*:
  - A non-routine situation that necessitates prompt action, primarily to mitigate a hazard or adverse consequences for human health and *safety*, quality of life, property or the environment. This includes *nuclear and radiological emergencies* and conventional *emergencies* such as fires, release of hazardous chemicals, storms or earthquakes. It includes situations for which prompt action is warranted to mitigate the effects of a perceived hazard.

*Similarly defined in EU Council Directive 2013/59/EURATOM*

# Is there consistent lingo? (cont)

- ‘Emergency’ and ‘Emergency Response’ are not defined in the DRAFT Nuclear Security Glossary. **Response** is defined as
  - All of the activities by a State that involve assessing and responding to a *nuclear security event*
  - In safety, “response” normally refers to response to a nuclear or radiological emergency, i.e. to the consequences for the safety of people and the environment of an accident or a *nuclear security event*. **In security, “response” normally refers to response to a *nuclear security event* itself, including identifying, pursuing and interdicting the cause of the event.**

- Safety is about protecting humans from radioactive sources
- Security is about protecting radioactive sources from humans
- A security incident can rapidly turn into a safety disaster



# Scenario: Sabotage

- Event(s) occur to push reactor operation towards unstable operating condition, with potential for release
- (Concurrent) cyber/IT attack on reactor primary shutdown system (SDS-1)
- Are security personnel needed at the points of event initiation or SDS-1?
- Send security responders to SDS-2 overrides, which are isolated from SDS-1. This is where an attack will occur.

# Swiss Cheese Theory of Complex Failure

