Pengenalan Ringan dan Singkat Konsep 3S (Safety, Security, Safeguards)

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Kerangka

Satuan acara perkuliahan

Minggu ke-13 | 15 November 2022*

- Topik

  Konsep 3S safety, security dan safeguard
- Subtopik

  Implementasi dari konsep perpaduan safety, security dan safeguard pada fasilitas nukir

*Sebagaimana tercantum dalam SAP di SIX.

Referensi

Referensi utama

- Donald Kovacic, “Organisational culture for safety, security and safeguards in new nuclear power countries”, chapter 4 in Verification & Implementation, A biennial collection of analysis on international agreements for security and development, VERTIC, 2015, pp 65-86.
  url http://www.vertic.org/media/assets/VI%202015/VI%20Chapter%204.pdf

Catatan kaki

- Referensi lain akan disertakan pada catatan kaki dengan tautan yang dapat diakses.
- Bila terdapat rangkaian slide menggunakan catatan kaki yang sama, catatan kaki disertakan hanya pada slide pertama pada rangkaian tersebut.

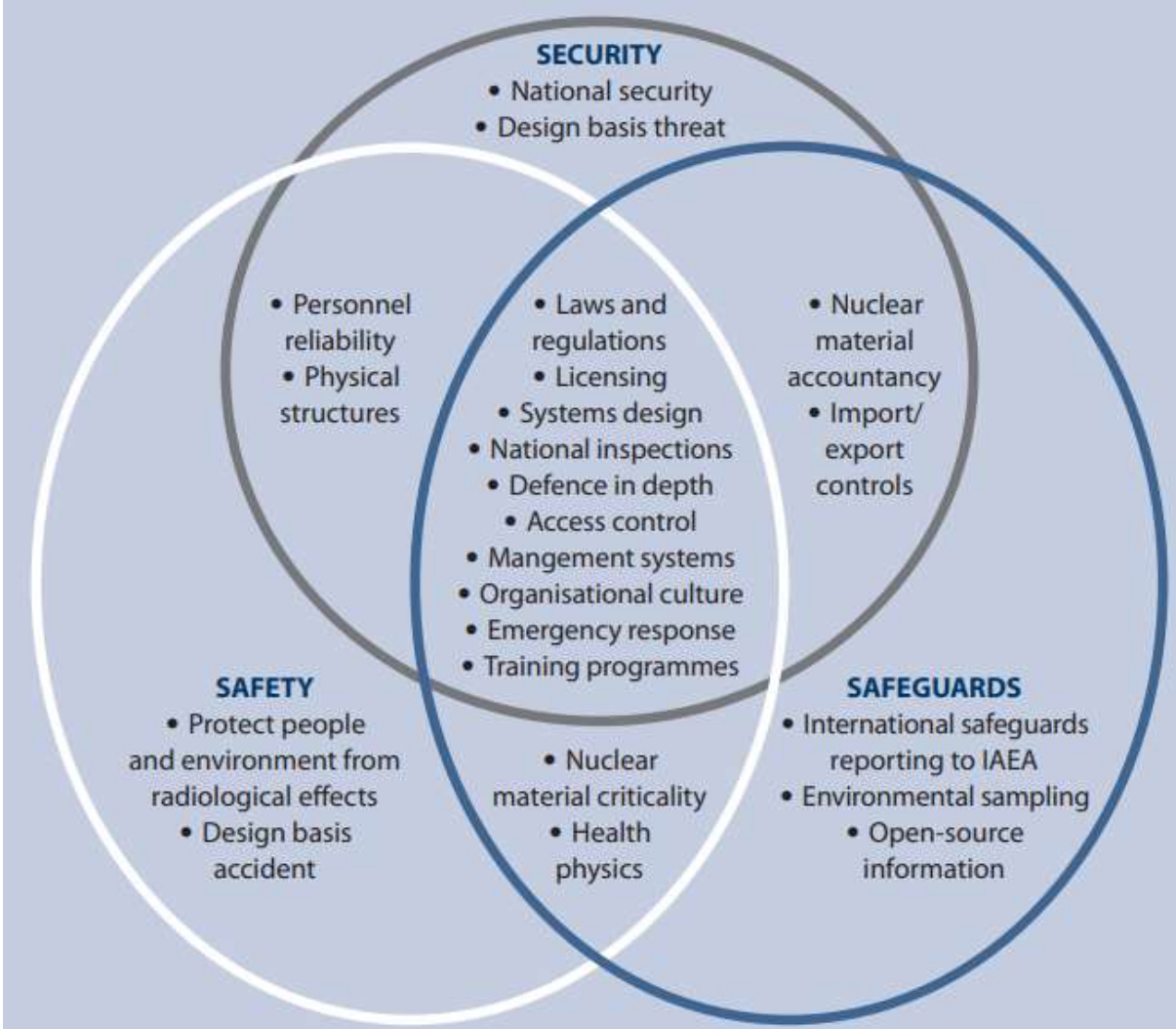
Istilah dan artinya

Istilah dan arti

Alberto Muti, “Nuclear Safety, Security and Safeguards", VERTIC, 2019, url https://www.vertic.org/wp-content/uploads/2019/10/AM-Nuclear-3S_UK-PONI-Presentation.pdf [20221117].

Security, Safety, Safeguards

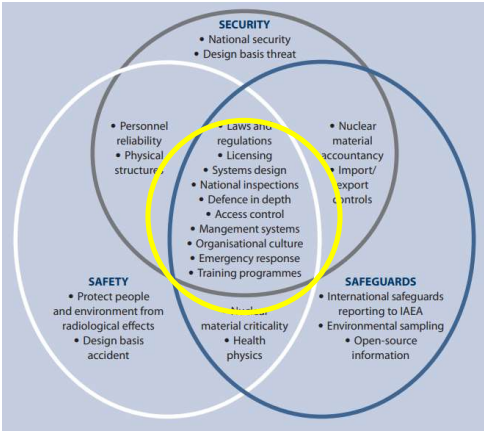
Relasi 3S



(Kovacic, 2015)

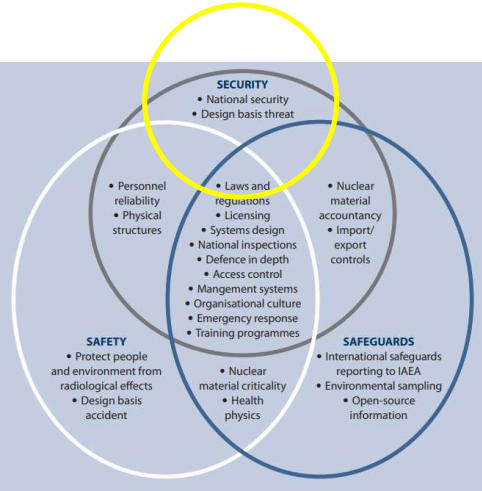
Termasuk di semua komponen 3S

- Laws and regulations
- System design
- National inspections
- Defence in depth
- Access control
- Management systems
- Organisational culture
- Emergency response
- Training programmes



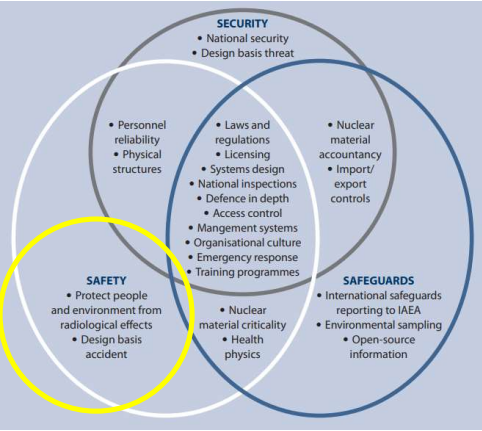
Hanya di Security

- National security
- Design basis threat



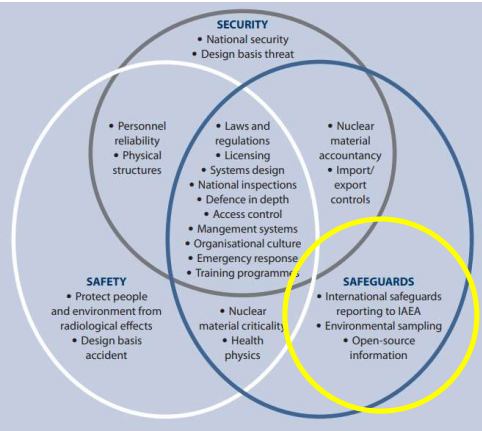
Hanya di safety

- Protect people and environment from radiological effects
- Design basis accident



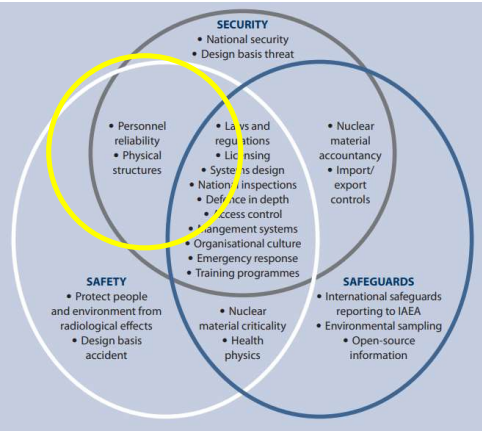
Hanya di Safeguard

- International safeguards reporting to IAEA
- Environmental sampling
- Open-source information



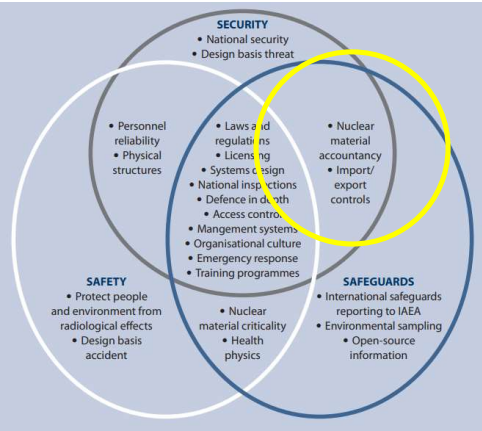
Irisan antara Security and Safety

- Personnel reability
- Physical structures



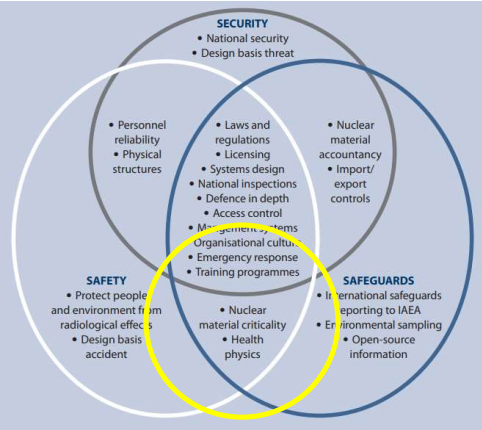
Irisan antara Security and Safeguards

- Nuclear material accountancy
- Import/export controls



Irisan antara Safety and Safeguards

- Nuclear material criticality
- Health physics



Good practices and challanges

Good practices

- *Common objectives:* safety, security, and safeguards share the ultimate objective of protecting people, society, the environment and future generations from the harmful effects of ionising radiation and the misuse of nuclear material. This ultimate objective can form the basis for close cooperation between organisations of nuclear facilities, regulatory bodies and governmental organisations.
- *Nuclear law:* to avoid inconsistencies among different laws, a country's nuclear law should recognise the interfaces and interrelations between nuclear safety, security and safeguards as well as liability for nuclear damage. Measures to address one subject may contribute to addressing another. A 'comprehensive law' can include common elements that apply to different subjects, avoiding repetitions or cross-referencing of separate laws. Such a comprehensive law can be easier to access and understand by stakeholders.

- *Coordinated regulatory approach:* some countries have determined that a regulatory body that includes safety, security, and safeguards in 'one house' is the most effective and efficient approach. However, other countries prefer separate regulatory bodies for those functions. In both cases, close cooperation is still needed between those responsible for safety, security and safeguards (simply putting them into one house is not enough).
- *Clear requirements for the operator:* for the operator of a nuclear power plant, it is important that regulatory requirements pertaining to safety, security and safeguards are clear and that they do not conflict with each other.
- *Integrated management systems (IMSs):* the implementation of an IMS by a nuclear organisation that includes safety, security and safeguards, and their interfaces, ensures that these elements are effectively coordinated with each other, and that they are included in its core processes. Many management processes are common across an organisation's disciplines, functions, and roles and responsibilities.

- *Early design input:* the most effective approach would be to provide for all requirements in safety, security and safeguards during the design stage of a nuclear facility, or as part of the bid specifications. This approach optimises the site-design process and reduces the chance for expensive retrofitting or design changes that would hinder construction of the facility.
- *Human resources development:* human resources and workforce planning should support career development for employees that cuts across the disciplines of safety, security and safeguards. Crosscutting career development contributes to employee satisfaction and interdisciplinary sharing of experiences, and it supports communication channels between sub-organisations. This approach should also extend to contract personnel.

- *Common training programmes:* as part of a systematic approach to training, all relevant personnel should have a basic understanding of how safety, security and safeguards are involved in an nuclear power plant. It is more efficient to have coordinated training programmes that train individuals on common topics.
- *Emergency preparedness and response:* having a coordinated response is crucial during a nuclear incident. This necessitates planning, preparation, communication, collaboration and joint exercises between all stakeholders and organisations that will be involved in, or affected by, an emergency. A lack of coordination between organisations responsible for safety, security and safeguards—that may not be apparent during normal operations—could lead to serious problems in mounting an effective response during an actual emergency.
- *Communication with the public during an emergency:* during an emergency, it is important that information related to safety, security and safeguards be provided to the public (as appropriate) in a consistent and timely manner, and preferably using trained spokespersons (even when the event is occurring outside one's own country). Informing the public in this way can help to avoid miscommunication, instill public confidence and prevent the escalation of public concern.

Challanges

- *Culture:* if it is cohesive and well-oriented, culture can be a positive force in an organisation, but if it lacks these attributes it can also be a negative force. The attitudes and assumptions within the different disciplines of safety, security and safeguards may create problems in communication and cooperation among organisations. However, when the purpose behind each of the areas is communicated to the various stakeholders, they are better able to understand the role that each plays in a new nuclear power programme. This understanding can improve the implementation of each area and avoid problems that would arise from a lack of knowledge and conflicts of interest. The underlying factor is that individuals are usually not experts in all areas, and should therefore be made aware of the other disciplines.

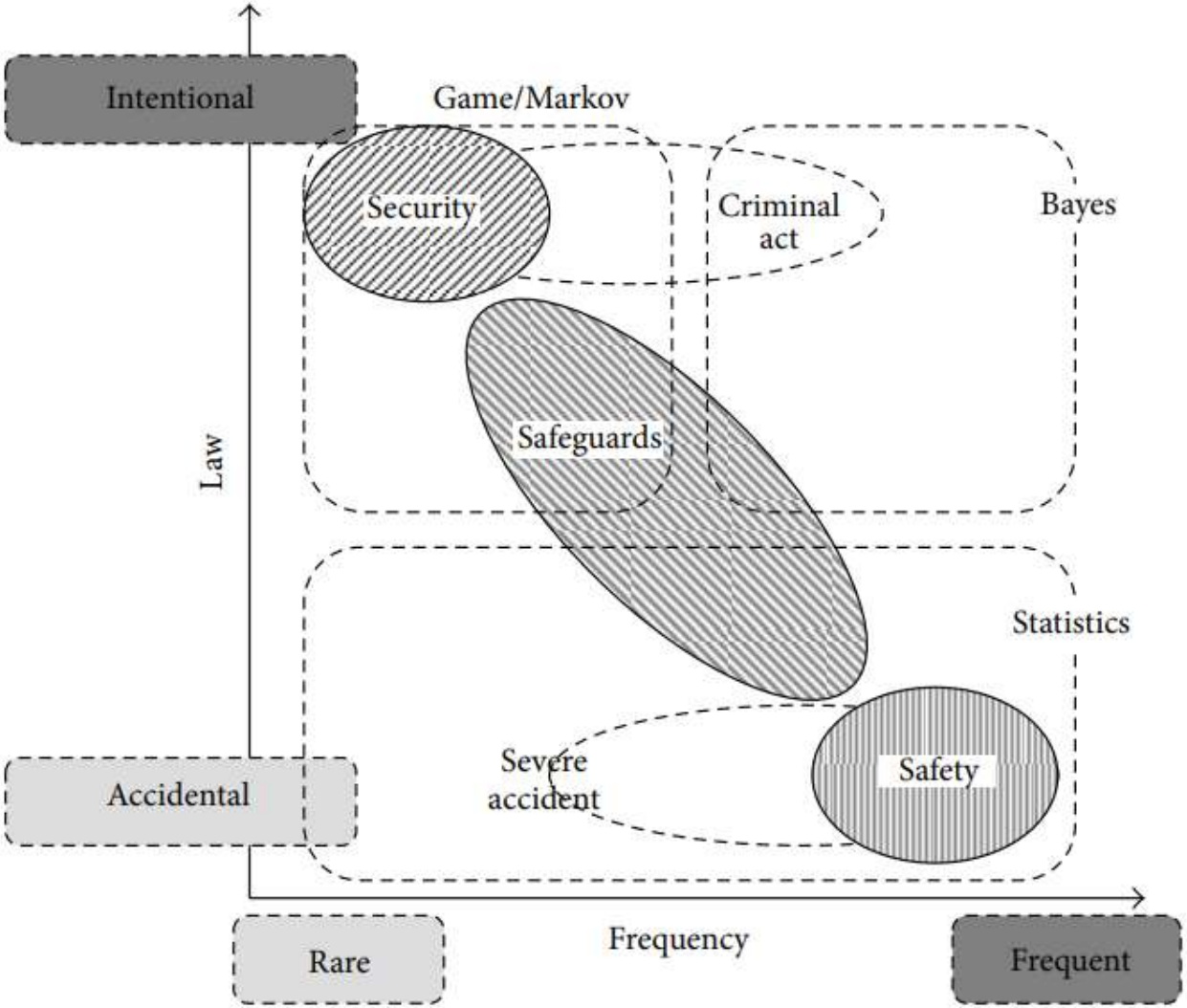
- *Access versus security:* generally speaking, increased security results in less access and convenience. However, if facility personnel are made aware of the reasons behind any increase in security, they will likely respond with greater acceptance and compliance.
- *Lack of consistent terminology:* the terminology used in referring to the interfaces and synergies between safety, security, and safeguards is not consistent in the nuclear industry and is therefore confusing. As such, it would be useful to develop a common understanding on using such terminology.

Mathematical models and assessment methodologies

Law – frequency space

- Horizontal axis: Frequency
- Vertial axis: Law
- Statistics: Reported event (+ natural disasters)
- Bayes: Events depend on other events
- Game/Markov: Particles/agents interactions (+ environment)

Mitsutoshi Suzuki, Norichika Terao, “Solution Monitoring Evaluated by Proliferation Risk Assessment and Fuzzy Optimization Analysis for Safeguards in a Reprocessing Process", Science and Technology of Nuclear Installations, vol 2013, id 590684, Feb 2013, url https://doi.org/10.1155/2013/590684.


Intentional
Game/Markov
Security
Criminal act
Bayes
Safeguards
Law
Statistics
Severe accident
Safety
Accidental
Rare
Frequency
Frequent

Consistency

- The overlaps between Safety, Security, and Safeguards seem not accomated to the model
- Inconsistency or implicit already considered? Any idea?

Terima kasih

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url https:// [20220830].