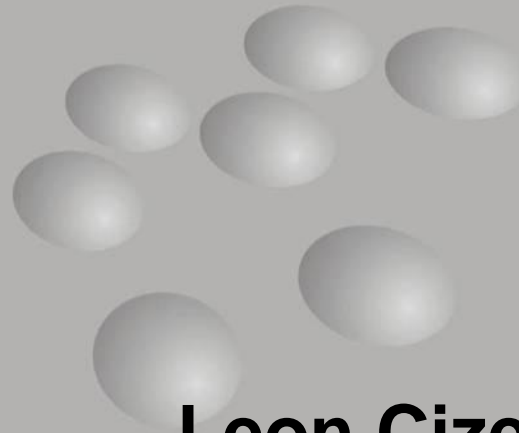




Nuclear Safety



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En.regional 012

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Ljubljana, Grand Hotel



**EVRO-ATLANTSKI SVET
SLOVENIJE**



Energetika.NET

Overview

- **Nuclear safety**
- **Research, Education and Training**
- **Safety Culture**

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Nuclear safety

Protect people and environment from the effects and risks of radiation

Safety functions in a nuclear power plant:

- Control the chain reaction in reactor
- Cool the reactor
- Contain the radioactive materials

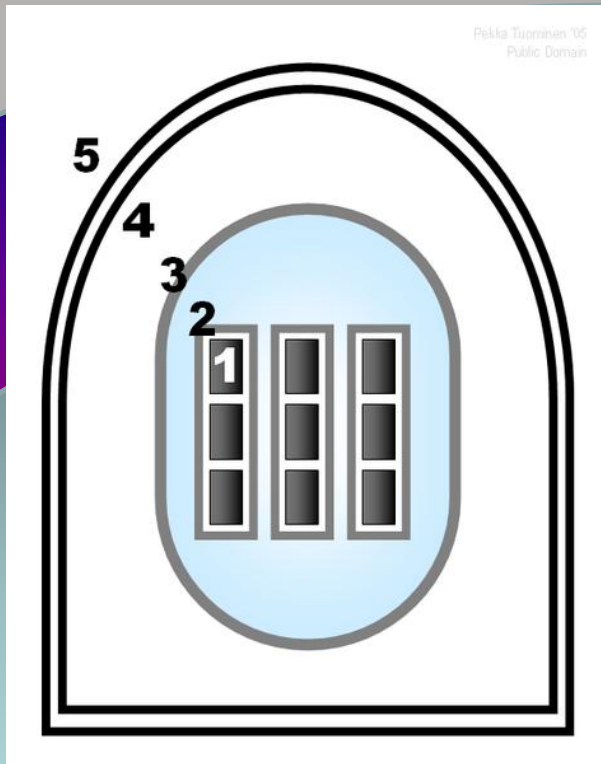
Redundancy, diversity, independence

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Nuclear Safety

Defense in depth:
barriers against release of nuclear materials



1 fuel pellet

2 fuel tubes

3 reactor pressure vessel

4, 5 containment

6 Exclusion Area

7 Evacuation Area



Research, Education and Training

- An operator must never be placed in a situation which an engineer has not previously analyzed.
 - Design, training, operation-The critical links: An Operator's perspective. By Ed Frederick, Control room operator TMI-2.
- Severe accidents to date :
 - complex combinations of initiating events unforeseen in plant designs
 - emergency responders outside the range of circumstances for which they were trained and equipped.
 - hindsight shows that relatively inexpensive improvements, detectable by more extensive analysis beforehand, may have avoided these accidents altogether.

Odborná literatúra "Ozele teletan"



A glance to the Aviation Safety

- ~4 accidents with fatalities per 10^7 flights
- The NASA report noted:
 - over 86 percent of “textbook emergencies” handled well
 - only ~7 percent of “nontextbook emergencies” handled well
 - See B.K. Burian, I. Barshi, and K. Dismukes, *The Challenge of Aviation Emergency and Abnormal Situations*, NASA Technical Memorandum 2005-213462 (2005)



INFORMED CULTURE

Those who manage and operate the system have current knowledge about the human, technical, organisational and environmental factors that determine the safety of the system as a whole.

REPORTING CULTURE

An organizational climate in which people are prepared to report their errors and near-misses.

JUST CULTURE

An atmosphere of trust in which people are encouraged (even rewarded) for providing essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behaviour.

SAFETY CULTURE

FLEXIBLE CULTURE

A culture in which an organisation is able to reconfigure themselves in the face of high tempo operations or certain kinds of danger - often shifting from the conventional hierarchical mode to a flatter mode.

LEARNING CULTURE

An organisation must possess the willingness and the competence to draw the right conclusions from its safety information system and the will to implement major reforms.



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Danger:

Complacency!

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Do you want safer nuclear power?

- Involve **the most gifted young people**
- More of research based education
 - Performed locally
 - Connected globally
 - **Develop problem solvers**

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