

# Finnish Experience in Emergency Preparedness - Experience of Cooperation Results

**European ALARA Network Workshop n°17**

ALARA in Emergency Exposure Situations

*15 – 17 May 2017, Lisbon, Portugal*

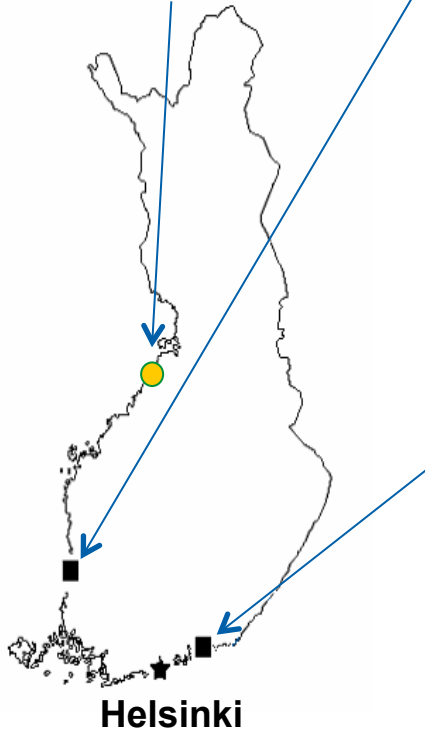
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# Nuclear power plants in Finland and in the neighbouring countries

Hanhikivi in construction license phase  
1 VVER (AES-2006)



Olkiluoto NPP  
2 BWR in operation  
1 EPR in pre-operational commissioning



Loviisa NPP  
2 VVER in operation

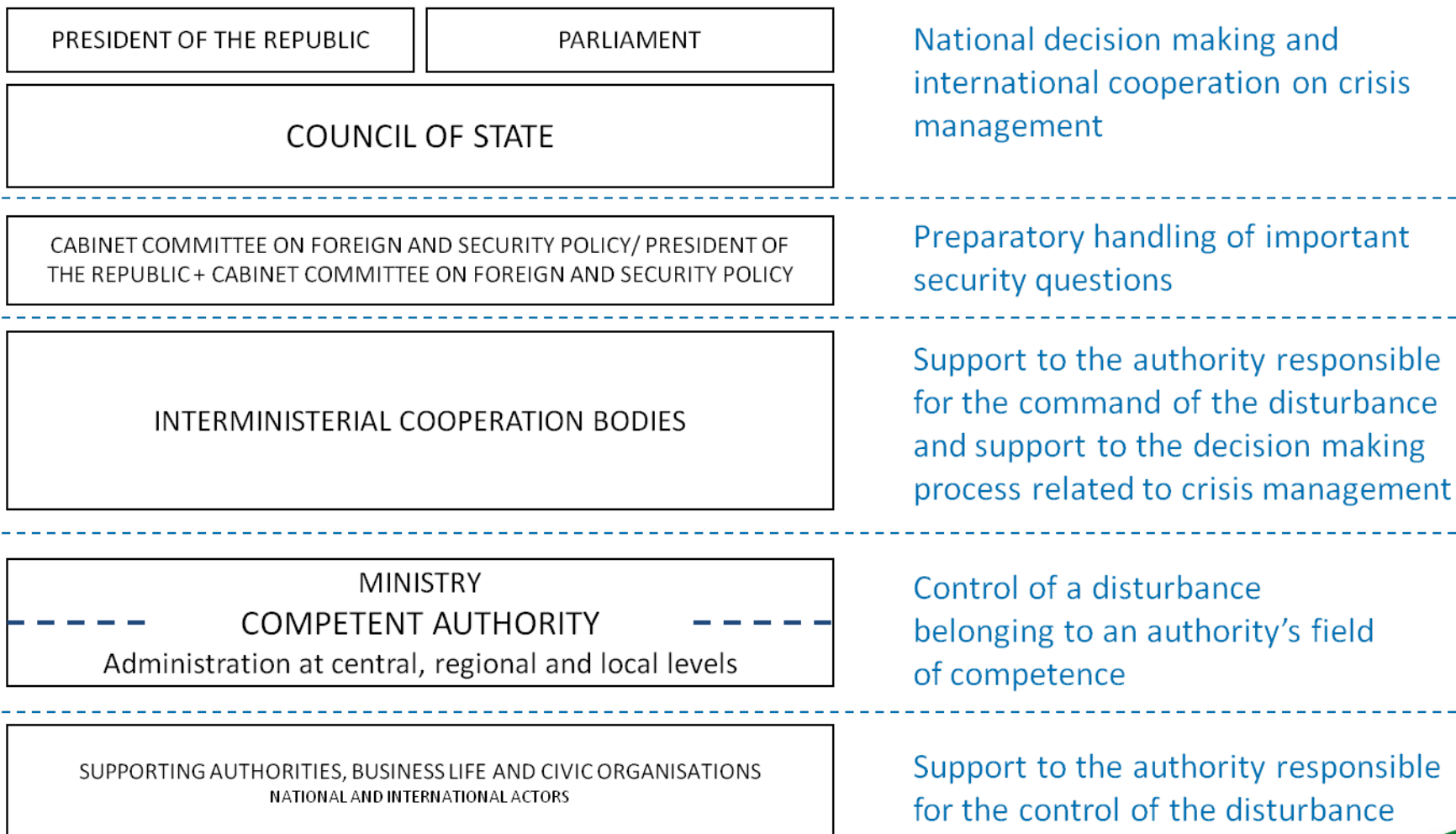


# Security strategy for society (Government Resolution 16.12.2010, currently under renewal)

Some principles:

- **Sharing responsibility across society.** Vital functions are secured by the efficient and comprehensive exploitation of society's resources. This requires that the public sector, the business community, organisations and state churches co-operate and that capabilities are co-ordinated in all situations.
- **Retaining the normal division of duties** The regular lines of authority for securing vital functions, the organisations responsible for it under normal conditions and the normal division of duties are maintained unchanged as far as is feasible in all situations.
- **Cost-effectiveness.** Society's vital functions are cost-effectively secured by developing the procedures and structures for normal conditions in such a way that they are also viable in disturbances and crisis situations. Co-ordination ensures that overlapping systems, organisations and functions on all administrative levels are minimised.
- **Co-ordination of measures** While one of the goals is to identify possible shortcomings in activities and to clarify the roles and responsibilities, the overall goals of co-ordination are to avoid unnecessary duplication. Subject to legislation, the competent authority is always in charge of making decisions, during and after the implementation of co-ordination. Some or all administrative sectors may be cooperation partners. Depending on the case, the same also applies to the representatives of the business community and organisations.

# Crisis Management



# Regional co-ordination groups for NPP emergency preparedness

- In 2008, the rescue director of Eastern Uusimaa Rescue Service took the initiative to establish a permanent co-operation group consisting of the Eastern Uusimaa Rescue Service, Loviisa power plant and STUK.
- In 2010, a similar group was set up by Satakunta Rescue Service, Olkiluoto power plant and STUK.
- The scope of activities of these groups includes:
  - development of the external rescue plan,
  - arrangement of training,
  - follow-up and implementation of the legislation and requirements related to emergency preparedness and response
  - other specified topics

# Regional co-ordination groups for NPP emergency preparedness

- In 2011, the regional police departments were involved in the work of the groups.
  - An emergency situation can be a consequence of an illicit action.
  - In all emergencies the police is responsible for controlling the access to the area.
- Other organisations like the Frontier Guard and Emergency Medicine have attended as well
- In 2014, a representative of the Ministry of the Interior was invited to participate in the work of the groups



# Examples of results of the work: Knowledge and training

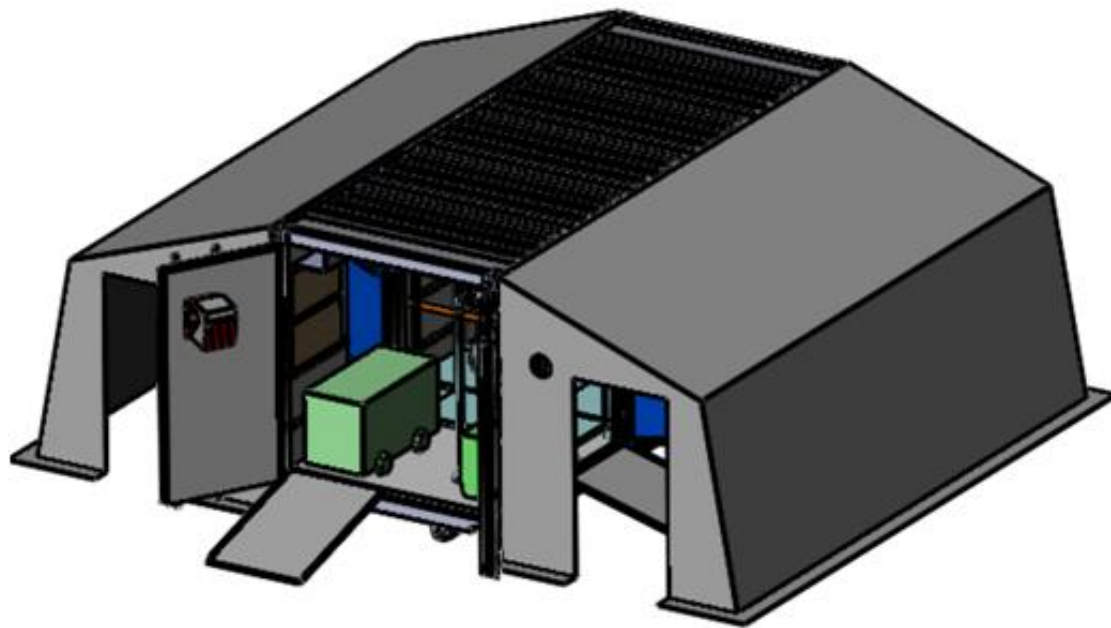
- Training days and workshops are organised in co-operation every two years. Main purposes are sharing the knowledge of each party's duties, getting new ideas for development as well as networking.
- Examples of topics:
  - Biological effects of ionizing radiation
  - Severe accidents at NPPs
  - Management of emergencies
  - Experiences from the Fukushima Dai-ichi accident (in kind co-operation with TEPCO)
  - Information to the public and authorities
  - Estimation of release and radiological effects
  - Estimation of plant situation



# Examples of results of the work – PPE Container

- A container for personnel protective equipment and radiation measuring instruments has been purchased for the Eastern Uusimaa region:
  - Design basis: equipment for 100 people for one week (masks, filters, coveralls, gloves, footwear, TLDs, dosimeters, dose rate meters etc.)
  - Transportable by a truck
  - Insulation, in-door and out-door lightning, heater, moisture removal, side tents, loading ramps etc. discussed in detail between Loviisa NPP, rescue service, police and STUK.
  - Container is purchased by the Eastern Uusimaa Rescue Service.
  - Protective equipment is suitable for normal use by NPP, rescue service or police.
  - Can be connected to the grid or to it's own movable power engine.
- The container is available to other authorities after a request for executive assistance.





- The container with the side tents is operable by two persons in 30 minutes.
- The local contract fire brigade will operate the container.
- Purchase of the PPE and radiation measuring instruments was accomplished 2014.
- National Emergency Supply Agency funded the radiation measuring instruments.
- First trainings 2015 and 2016.





Principle of logistics



Power engine

# Examples of results of the work - TETRA-phone

- In case of an emergency, there are several ways to share the situational awareness:
  - Commercial telephone networks, both wired and wireless, telefax
  - Internet (especially logbooks can be shared)
  - An automatic data transfer system for sending the process data from the NPP to STUK's emergency centre
  - Separate authorities' network "VIRVE", which is based on the European TETRA-standard
  - Satellite phones
- TETRA-phones are in daily operative use for example by the police and the rescue services.



# Examples of results of the work - TETRA-phone

- For emergency situations there is a separate user's group defined.
- The emergency manager of NPP, the director of rescue operations and the emergency manager of STUK are allowed to speak in the group. Others may listen.
- The dedicated user's group has been found an effective way to communicate during exercises.



# Examples of results of the work – TLD readings

- Three approved dosimetry services (Loviisa NPP, Olkiluoto NPP and Doseco Oy).
- STUK required NPPs to investigate how doses are measured in a case there the normal facilities are inoperable for example due to destruction of infra or due to fallout
- Both NPPs use TL-dosimeters and devices from RADOS:
  - Loviisa TLD-chips: LiB (Hp<sub>10</sub> reserve) <sup>7</sup>LiF (Hp<sub>10</sub>) LiB (Hp<sub>10</sub> + n) LiB(Hp<sub>0,7</sub>)
  - Olkiluoto TLD-chips: LiB (Hp<sub>10</sub> reserve) <sup>7</sup>LiF (Hp<sub>10</sub>) <sup>7</sup>LiF (Hp<sub>10</sub>) LiB (Hp<sub>0,7</sub>)
- Photon energies of ISO N300 (0,15 mSv and 1,2 mSv) and <sup>60</sup>Co (100 mSv) were used in the tests.



# Examples of results of the work – TLD readings

- Three different methods for dose measurement were analysed by Doseco Oy.
  - Transfer the dosimeters, database, calibration dosimeters and Sr-90 irradiator to another dosimetry service. Calibrate the reader and use in a normal way.
  - Transfer only dosimeters, define material background and material sensitivity after the reading. Three readings per dosimeter needed.
  - Transfer only dosimeters, define the dose using a known dose as a reference after the reading. Two readings per dosimeter needed.
- All three showed satisfactory results.
- **It's possible to carry out dose measurement and obtain confident results by using other dosimetry service's devices.**

## Example of synergy: Pump containers

- Together with Neste Oil refinery, Eastern Uusimaa Rescue Service has purchased high capacity pumps designed to extinguish an oil tanker fire.
- The pump set is an operative unit of the rescue service, under the direct command of the director of the rescue operations.
- Available in case of an NPP emergency. Containers can be placed on a naval vessel and also transported by road.
- Capacity 40 m<sup>3</sup> water / minute.



# Example of synergy: decontamination of persons and vehicles

Decontamination line of Satakunta Rescue Service is capable of washing injured persons.



Decontamination vehicle of the Finnish Defence Forces in action during LOVIISA13 large scale emergency exercise.



Foto: Marko Laukkanen



# Example of synergy: decontamination of persons and vehicles

YRJÖ-16 exercise:

- Joint exercise of regional rescue service, (voluntary) contract fire brigades and the Finnish Defence Forces.
- About 10 vehicles and 40 persons as the targets.



# Future aims and challenges

- To continue the co-operation at the existing emergency planning zones
- To build the regional co-ordination group in the Northern Ostrobothnia (Hanhikivi NPP).
- To investigate the possibilities for closer co-operation with the so called third sector (voluntary organisation and associations).
- Impacts of the on-going administrative reform (state / regional / local)?



**Thank you for your attention!**

**(Helsinki on May 10<sup>th</sup> 2017)**