


Overview of plants emergency organization (example)



**Joint IAEA-ICTP Essential Knowledge Workshop on
Nuclear Power Plant Design Safety – Updated IAEA Safety Standards 9-
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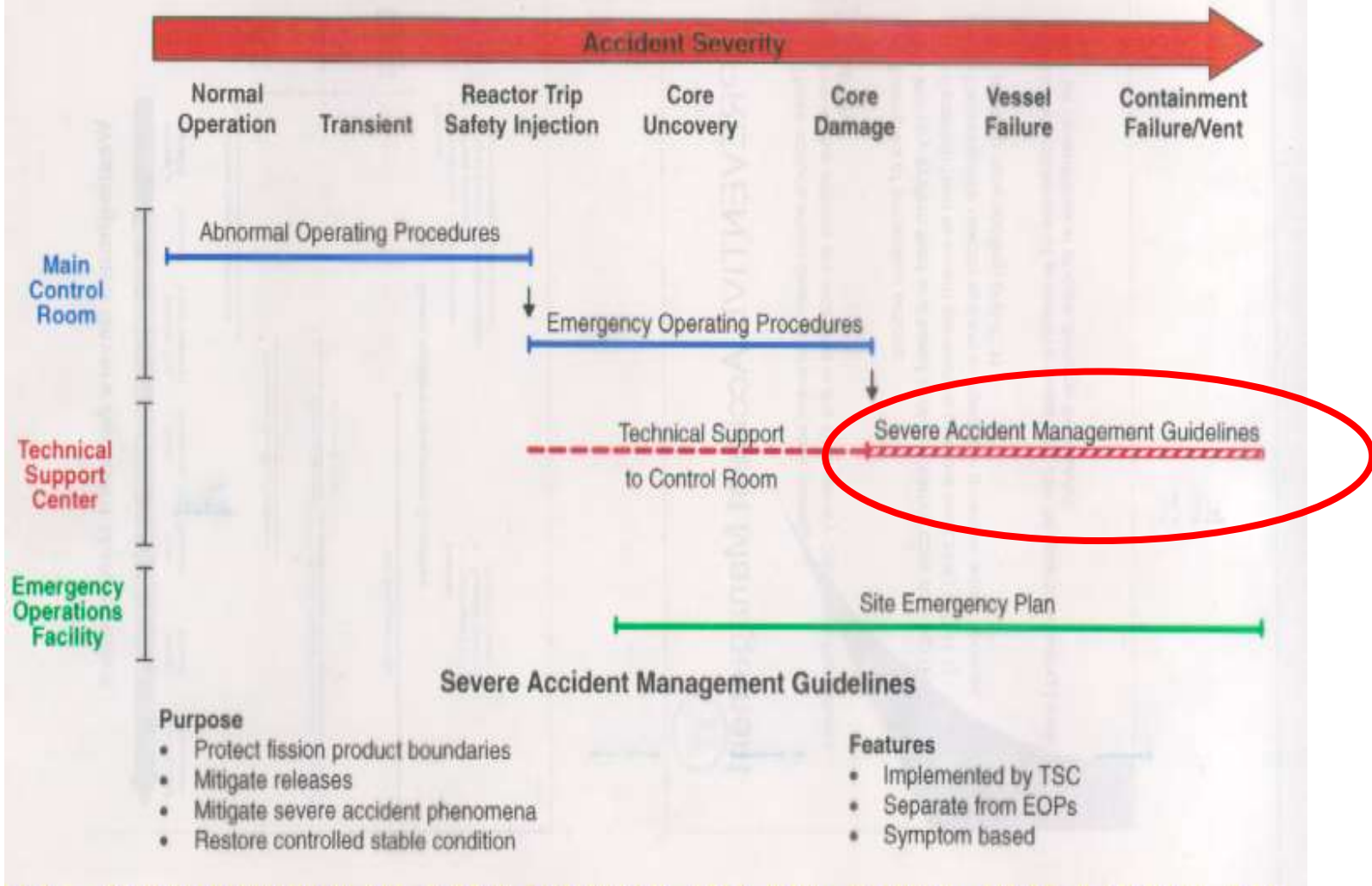
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- Performance of SAMGs – responsibility?
- Emergency Response Organisation (ERO)
- Technical Support Centre (TSC)
- Operational Support Centre (OSC)
- Emergency Operations Facility (EOF)
- ERO Training
- ERO Drills and Exercises
- References

A blue speech bubble with a white border, pointing towards the 'Emergency Response Organisation (ERO)' item in the list. It contains text in white font.

Krško NPP's Emergency Response Organization (ERO) from Special Safety Review Final Report, Rev.0, October 2011

Westinghouse Severe Accident Management



The entire concept of the on-site emergency preparedness and planning is determined in Krško NPP's RERP. **It is a license document**, reviewed at least annually and approved by the Krško NPP management board. The main objectives of the Krško NPP's RERP are:

- identification and evaluation of various types of accidents and emergencies which could potentially occur at the plant;
- identification of on-site accident management and emergency response measures;
- identification of on-site emergency response organization (ERO) and the responsibilities for the overall command, control and coordination of the emergency response;
- identification of responsibilities to carry out particular emergency measures;
- delineation of off-site support;
- delineation of obligations of Krško NPP regarding off-site emergency response;
- delineation of coordination of response activities with off-site authorities;
- identification of Krško NPP's emergency facilities, equipment and communications;
- identification of on-site recovery measures and organization;
- identification of basic instructions for maintaining on-site emergency preparedness.

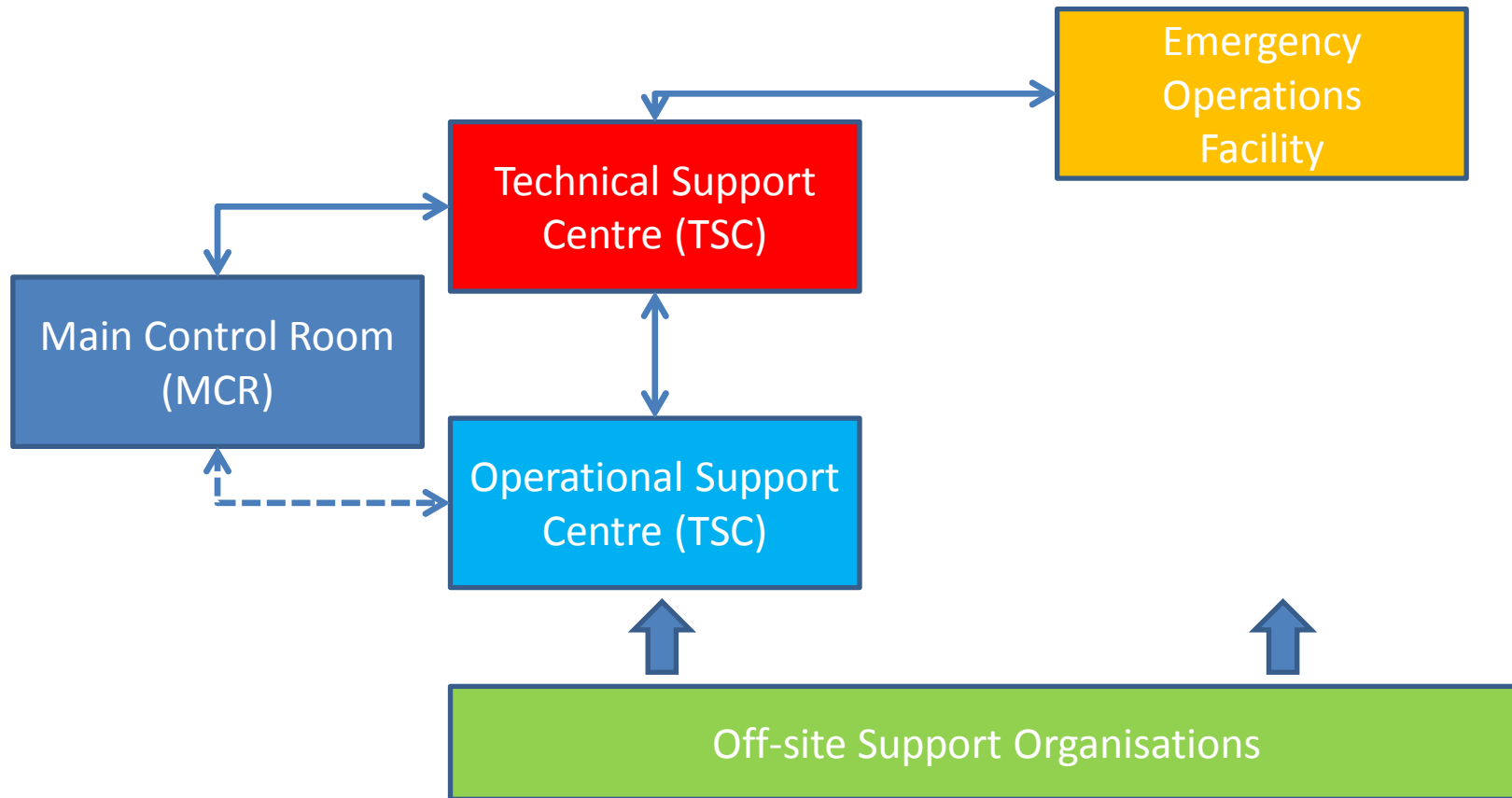
The Krško NPP's accident management and emergency response organization (ERO) is an element of the site emergency preparedness. It ensures:

- overall direction and coordination of the on-site emergency response and coordination with off-site emergency response authorities;
- effective realization of particular emergency response measures.

Krško NPP's ERO is based on normal internal operating organization and consists of organizational structures activated depending on the emergency level and located in emergency response facilities (ERF). Organizational structure of the ERO (see Figure) is as follows:

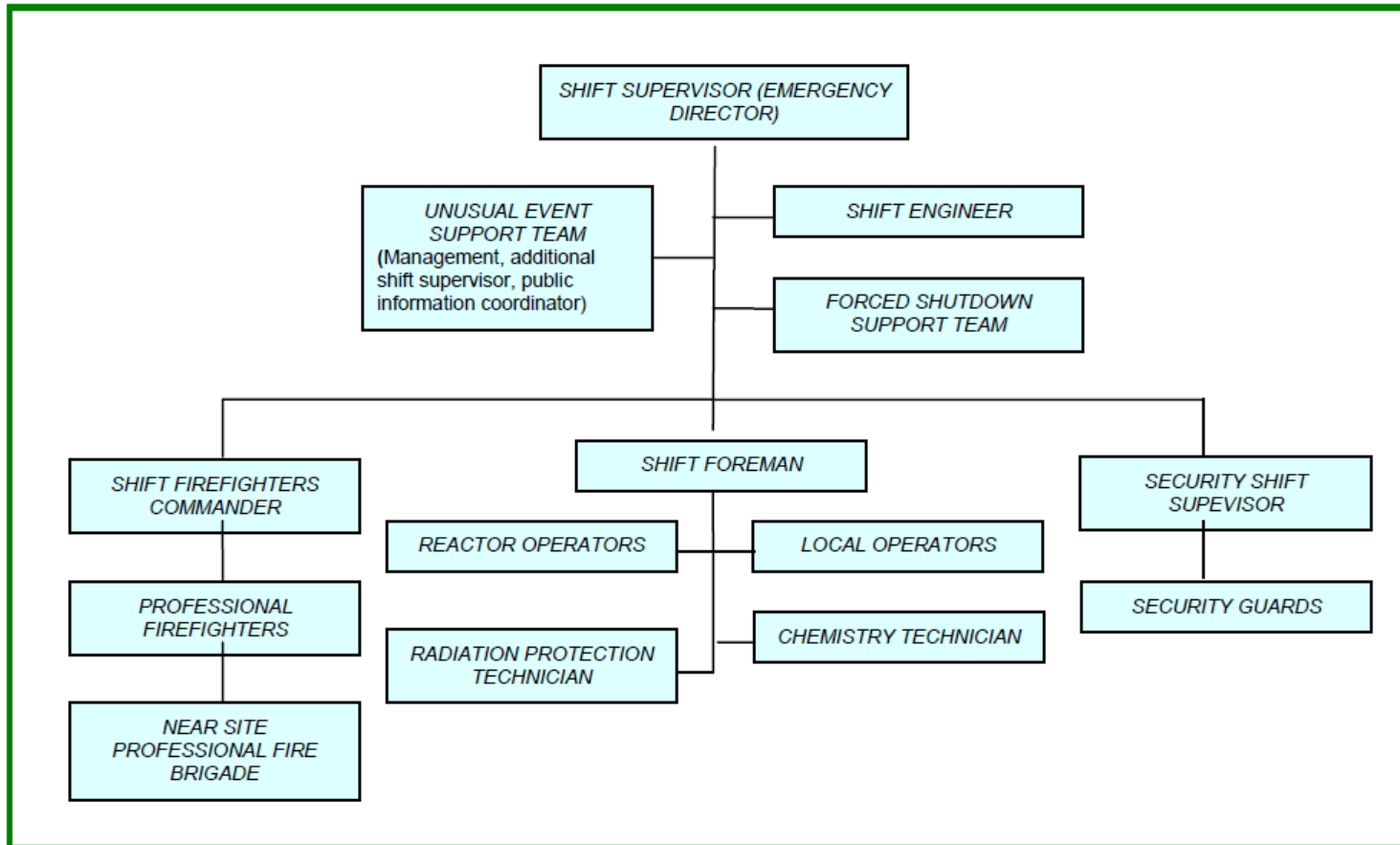
- main control room (MCR) and shift organization
- on-site part of ERO (Technical support center (TSC) and Operational support center (OSC)), which is activated in alert or higher level of an emergency;
- off-site part of ERO (Emergency operations facility (EOF)), which is activated in case of site emergency or general emergency; EOF is located about 100 km from the plant in Ljubljana City where is also the location of Civil Protection Headquarters of the Republic of Slovenia.
- additional support to the Krško NPP's ERO which is provided on contractual basis by Off-site support organizations regardless of the emergency level.

Emergency Response Organisation (ERO)



- Krško NPP's ERO comprises personnel possessing adequate technical knowledge and skills assuming their duties in accordance to the RERP.
- Emergency tasks and duties of intervention personnel correlate with normal organization tasks and duties.
- For **each position in the ERO**, emergency responsibilities and tasks are defined in the Krško NPP's RERP and **Emergency Implementing Procedures (EIPs)**.
- In order to minimize confusion and assist in the control of the emergency response, the ERO is designed so that only dedicated person, or his alternative, is responsible for the implementation of specific emergency actions. In addition, the functional areas of responsibility remain flexible enough to accommodate the needs of the emergency and the availability of personnel.
- The ERO is staffed with at least two persons at each position to ensure continuity of the response on activation, to have provisions for a dual shift operation which provide 24-hour coverage of emergency positions and enable long-term shift work.

Emergency Response Organisation (ERO)



Krško NPP Emergency Shift and Unusual Event Organization

Until the TSC is not operable, management and coordination of the emergency response is organized within the MCR shift organization.

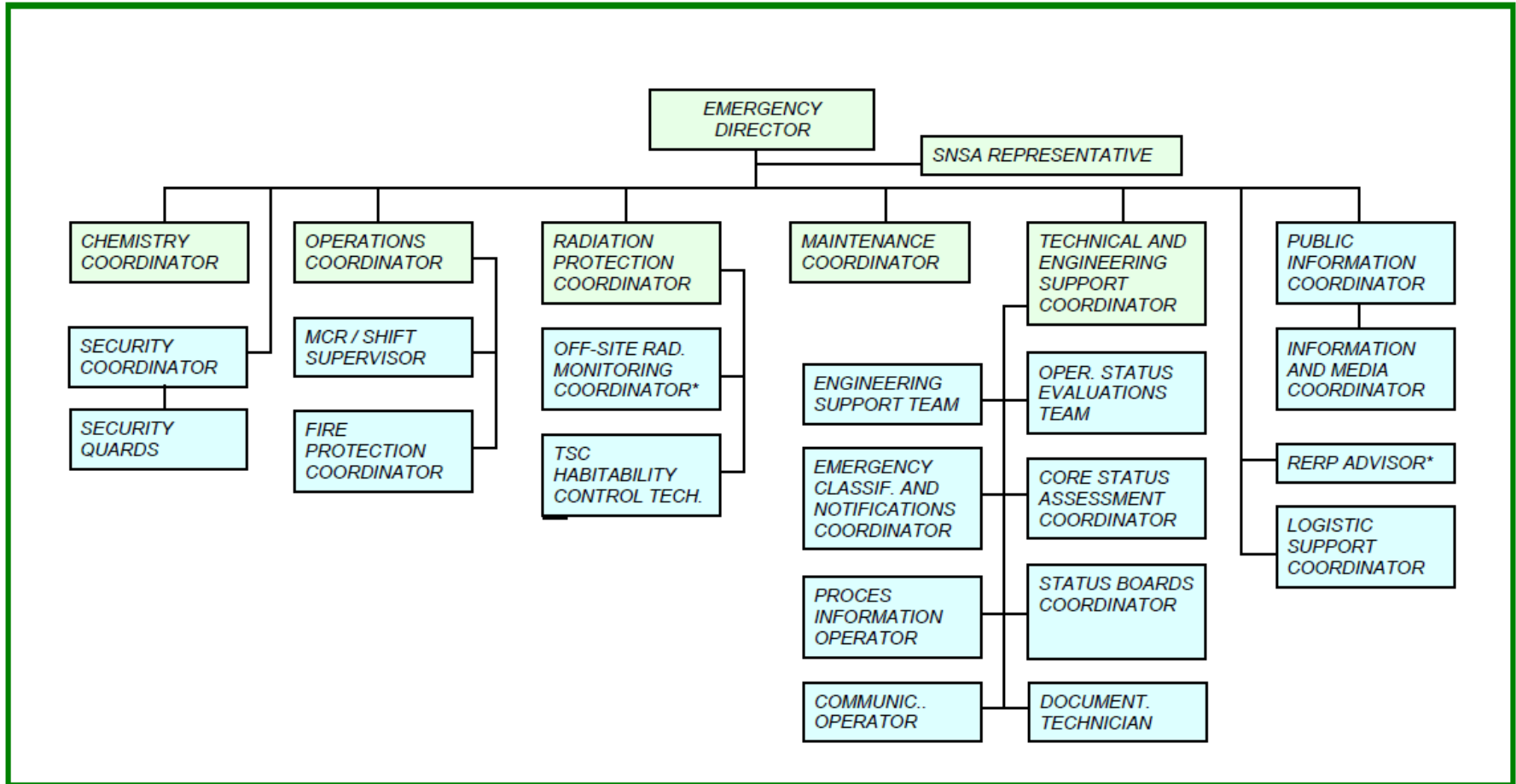
The shift accident management and emergency response extend operators actions, corrective, protective and security measures, emergency classification, activation of ERO, off-site notifications, evaluation of off-site radiological consequences and protective actions recommendations.

The Shift Supervisor assumes the function of the Emergency Director until either the Technical director or his alternate in the TSC assumes this function, or a close out of the emergency is declared.

The TSC is organized, equipped and structured to carry out the following emergency response functions:

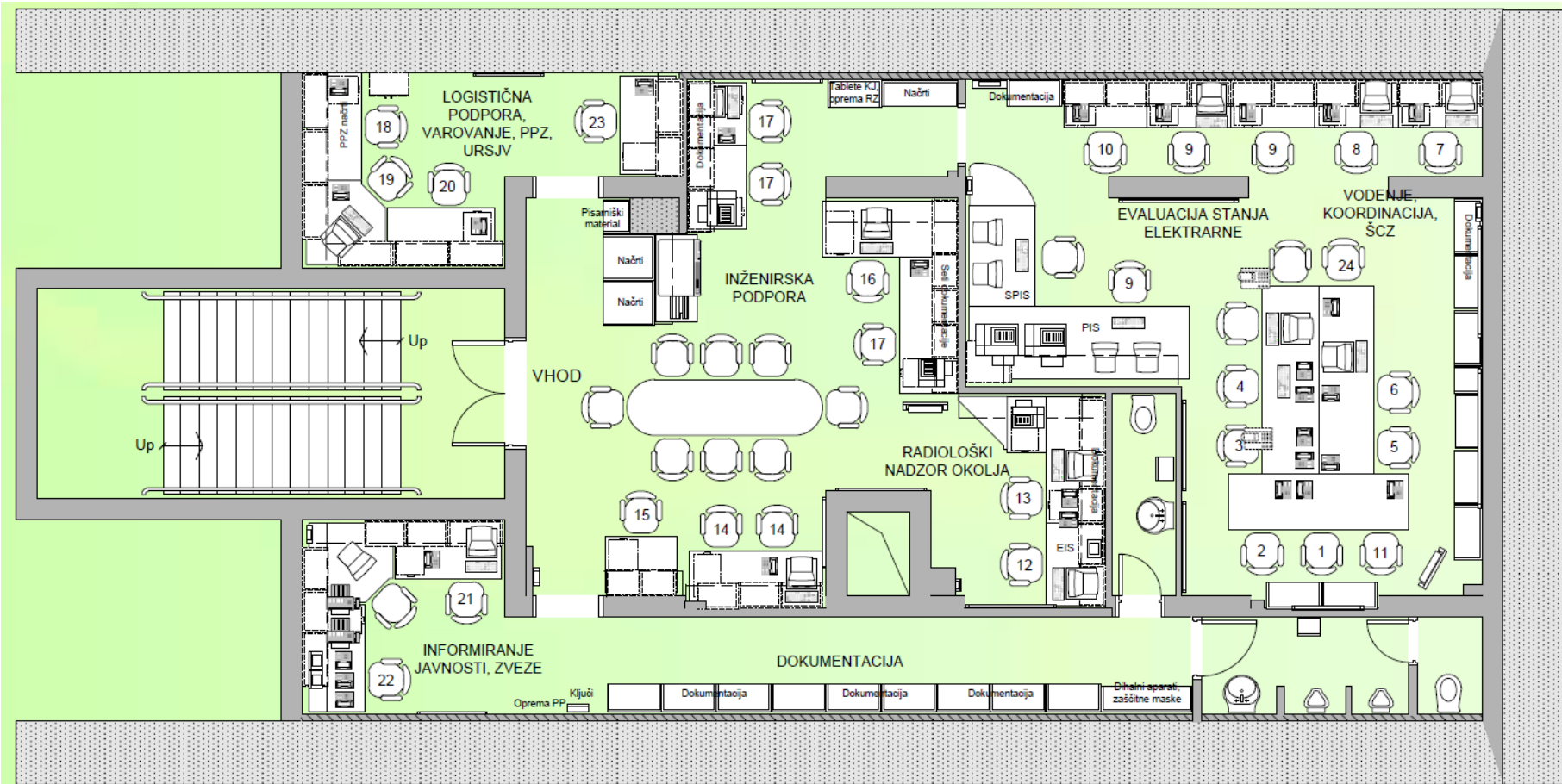
- overall managing and coordination of on-site emergency response;
- evaluation of plant safety and emergency response status;
- operations and activities in MCR support;
- on-site technical and engineering support and coordination;
- making decisions and coordination of corrective actions;
- coordination of security measures;
- making decisions and coordination of protective and rescue measures;
- coordination with off-site support organizations and authorities;
- evaluation and making decisions on severe accident management strategies;
- coordination of logistics;
- provided EOF functions until EOF becomes operable.

Technical Support Centre (TSC)



Krško NPP TSC organization

Technical Support Centre (TSC)

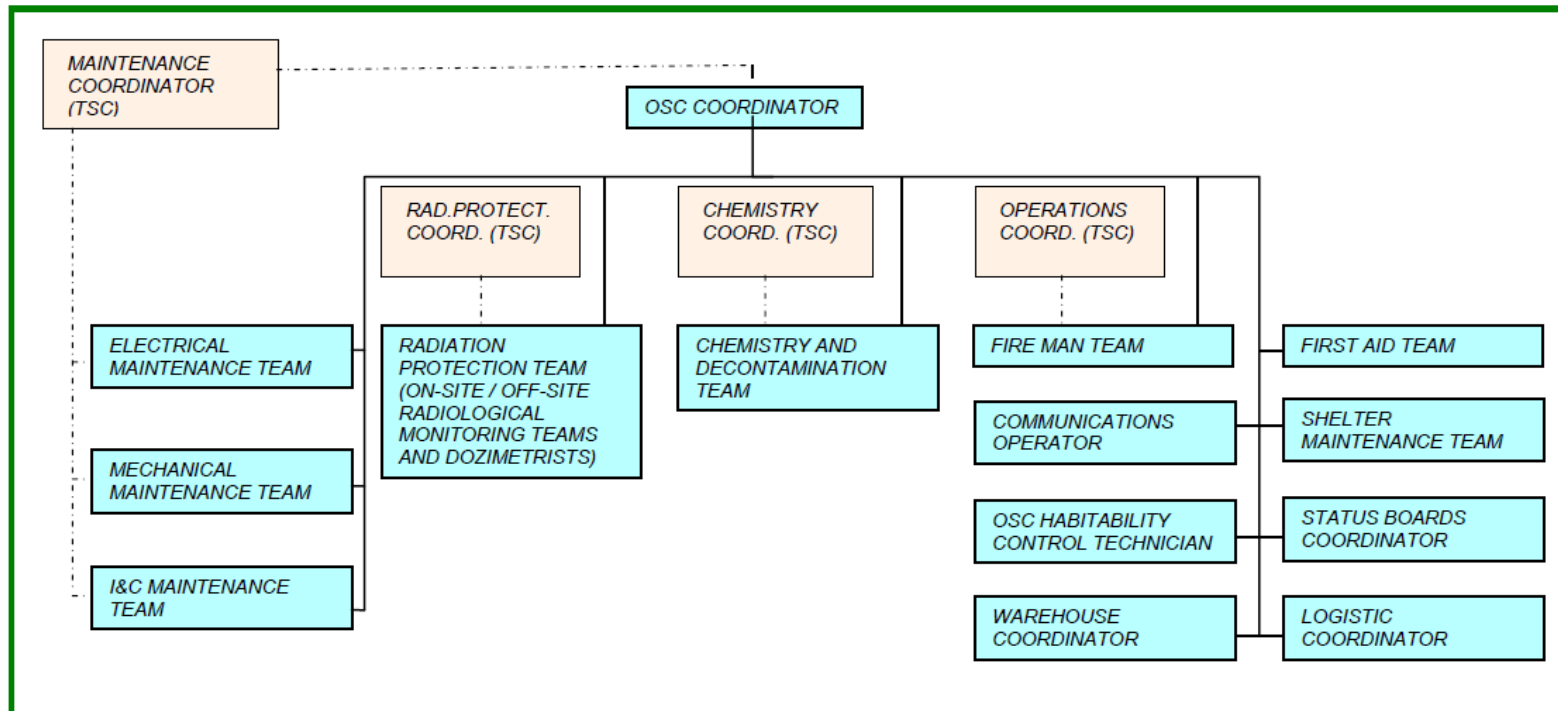


Operational Support Centre (OSC) Organization

- The OSC is organized, equipped and structured to place the intervention teams and carry out the on-site intervention measures determined in the TSC. The following intervention teams are placed in OSC:
 - radiation protection intervention team;
 - chemistry intervention team;
 - first aid intervention team;
 - fire fighting intervention team;
 - mechanical maintenance intervention team;
 - electrical maintenance intervention team;
 - I&C maintenance intervention team;
 - other support personnel.

Operational Support Centre (OSC)

- The OSC Coordinator coordinates OSC operation. He is responsible to the Maintenance coordinator in the TSC. Commanders of the intervention teams and other OSC support personnel provide support to the OSC coordinator. Commanders of intervention teams are responsible to coordinators of individual tasks in the TSC.



Krško NPP OSC organization

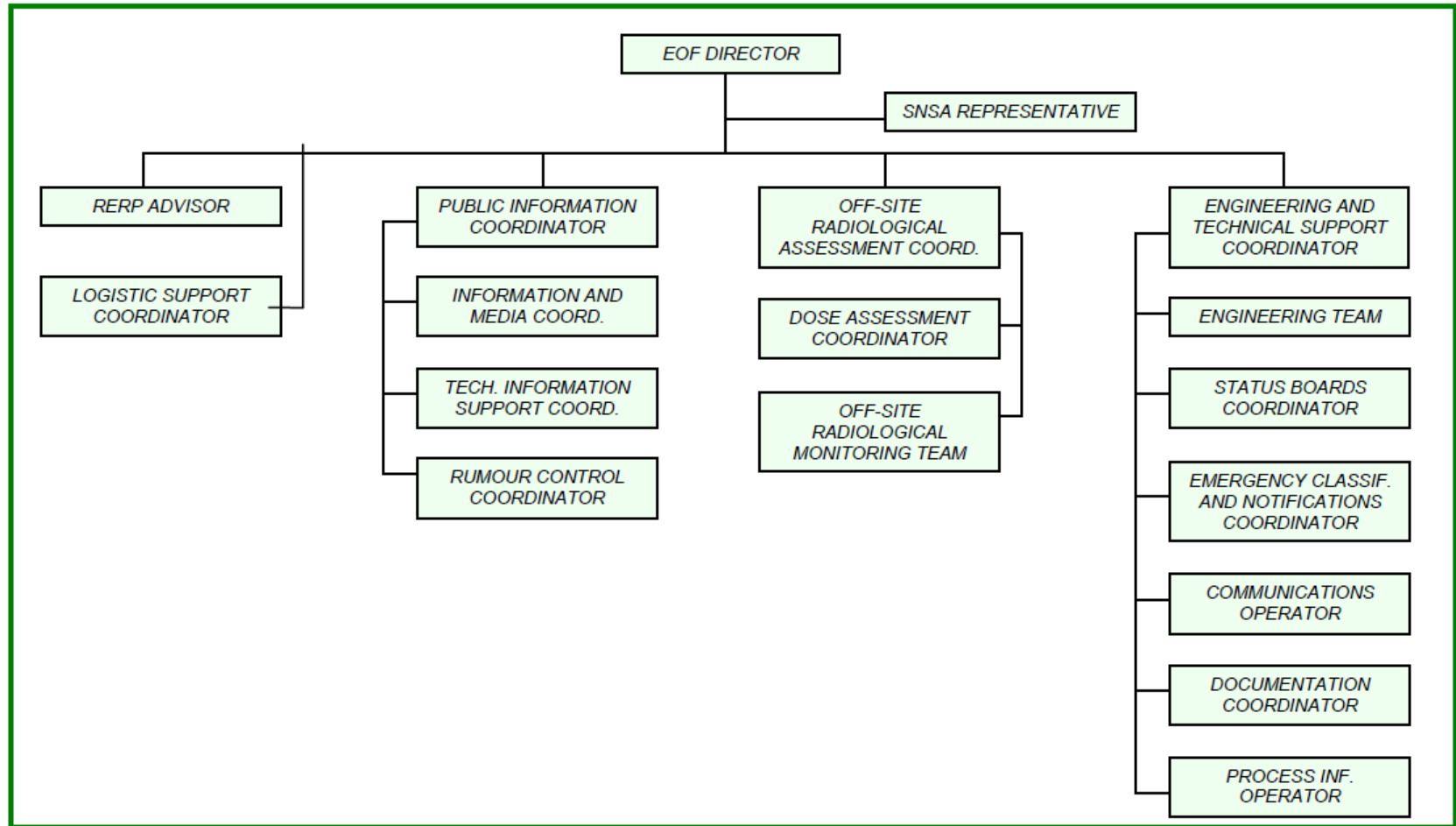
- If TSC and/or OSC primary locations are not available, TSC/OSC is evacuated to the other onsite locations or to the near-site alternative location (AL).
- The AL also provides the opportunity to gather TSC and OSC personnel if access to the plant is impeded. In this case the shift supervisor assumes the emergency director's function and TSC emergency response functions are delegated to the MCR and EOF. In such a case, the EOF is activated irrespective of emergency level declared.
- The AL is a predetermined reserve location about 3 km from the plant, equipped, sized and organized to place the TSC and OSC staff to be in readiness for intervention immediately after the access to the plant is established.

The EOF is organized, equipped and located to carry out the following emergency response measures:

- overall direction and co-ordination of the Krško NPP's emergency response;
- engineering, technical, logistic and other support to the TSC and intervention personnel on-site;
- coordination with the Civil Protection Headquarters of the Republic of Slovenia, SNSA, other authorities and off-site support organizations;
- emergency classification and off-site notifications;
- evaluation of off-site radiological consequences and recommendations of urgent protective measures for the population;
- public information.

The President of Krško NPP's Management Board assumes the function of EOF director. The EOF director manages and coordinates the overall Krško NPP's emergency response. He coordinates the activities with the Civil Protection Commander of the Republic of Slovenia, SNSA director and other state authorities.

Emergency Operations Facility (EOF)



Krško NPP EOF organization

- Emergency response training is a part of the overall Krško NPP training program coordinated by the training department. Training program is based on systematic approach to training process. Training consists of classroom, on the job training, drills and exercise. Emergency response training, activities are planned on annual basis within overall Krško NPP annual training plan.
- The following target groups are regular involved in emergency response training plan:
 - all Krško NPP's employees and contractors' personnel,
 - intervention personnel assigned to the Krško NPP's ERO and
 - intervention personnel of off-site emergency response support organizations.
- The intervention personnel assigned to the Krško NPP ERO and intervention personnel of offsite emergency response support organization receive additional emergency response training for their respective assignments. The intervention personnel include shift staff (main control room operators, local operators, firefighters, security guards) and staff in Krško NPP's emergency response facilities (TSC, OSC and EOF). Emergency response training for these personnel
- consists of initial and continuous with specialized (proficiency) emergency response training.

- Krško NPP regularly conducts different types of drills and exercises to :
 - verify the status of emergency preparedness of ERO and participating support organizations,
 - allow the participants to be familiar with their duties and responsibilities,
 - develop and maintain skills,
 - verify the adequacy of methods described in the emergency response procedures,
 - check the availability and operability of emergency supplies and equipment, and to
 - identify and correct erroneous performance.

The Krško NPP is carrying out the drills with the frequency as follows:

- off-site notifications – once per year (communications are checked once per month);
- fire-fighting – once per month;
- first aid (one shift per year) and medical intervention – once per year;
- off-site radiological monitoring – three times per year;
- assessment of off-site radiological consequences and protective actions recommendation – two times per year;
- post-accident sampling – once per year;
- post accident radiation monitoring – once per year; - evacuation and personnel

- accountability – two times per year;
 - activation of the ERO – once per year (the response of the intervention personnel is checked once per month);
 - manipulation with on-site severe accident management mobile equipment and
 - preparation for severe accident management strategies based on EOPs or SAMGs evaluations (on yearly basis).
- The licensed operators are regularly trained in accordance to the licensed operator training program. It consists of four segments of training per year and includes operational management of plant abnormal and emergency conditions according to AOP's and EOP's on the plant's fullscope simulator.

1. NPP Krsko Special Safety Final Report, Rev 0, October 2011 (from www.ursjv.gov – Slovenian Regulatory Body)
2. IAEA-TECDOC-1440, Overview of training methodology for accident management at nuclear power plants, April 2005
3. IAEA GS-G-2.1, Arrangements for Preparedness for a Nuclear or Radiological Emergency, 2007