

# Legislative and Regulatory Framework for Protecting Emergency Workers in Ukraine

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# General Principles of Civil Protection



## **Constitution of Ukraine**

*“The person, his life and health, honour and dignity, inviolability and safety are recognized in Ukraine as the highest social value”*

## **Code of Civil Protection of Ukraine**

- constitutional rights of citizens for protection of life, health and property;
- priority of tasks aimed at rescue of life and preservation of health of citizens;
- voluntariness in case of involvement of citizens in civil protection activities insecure for live and health;
- justified risk and responsibility of civil protection managers for ensuring safety during rescue work.

# Dose Limits

Category of exposed persons	A
Effective dose limit, $\text{mSv}\cdot\text{year}^{-1}$	
$DL_e$	20
$DL_{e\ max}$	50
Equivalent dose limits, $\text{mSv}\cdot\text{year}^{-1}$	
$DL_{lens}$ (for eye's crystalline lens)	150
$DL_{skin}$ (for skin)	500
$DL_{extrim}$ (for hands and feet)	500

# Emergency Workers

**EMERGENCY WORKERS**  
a staff participating in work at the  
facility in emergency

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graph TD; A["EMERGENCY WORKERS  
a staff participating in work at the  
facility in emergency"] --> B["MAIN STAFF  
the personnel of the  
facility in emergency  
and members of special  
emergency brigades  
prepared in advance"]; A --> C["OUTSIDE STAFF  
the personnel involved in  
emergency work, trained  
and informed on radiation  
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```

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# Emergency Workers, cont.

- Dose constraints for the main staff aim at non-exceeding the values of regulations for the staff of category A;
- The outside staff in conditions of “General emergency” is to be given the status of the staff of category A;
- The outside staff and the main staff are to be provided at the same extent with all regular and special means of individual and collective protection as well as with system to measure and record doses received during the work;
- Emergency workers are to be permanently informed on received and potential doses as well as on relevant health hazard.

# Increased Planned Exposure

The increased planned exposure of emergency workers is allowed when work is associated with the following situations:

- when undertaking intervention to prevent serious negative health effects;
- when undertaking actions to avert a large collective dose;
- when undertaking actions to prevent such a development of accident that may lead to catastrophic conditions;
- when undertaking actions to save human lives.

# Increased Planned Exposure, cont.

## **50 - 100 mSv per year**

- to be authorised by the local authorities of the State Sanitary-Epidemiological Inspectorate;
- to be compensated in such a way that after the period of 10 years an effective dose would not exceed 200 mSv;
- any measures to keep doses  $< 100$  mSv are to be taken;

## **100 - 250 mSv**

- to be authorised in the exceptional cases by the Ministry of Health;
- only once during all the working activity of the employee.



# Increased Planned Exposure, cont.

## < 500 mSv

- for any organ or proportional irradiation of the whole body.
- ✓ **The individuals exposed to dose > 100 mSv are to be taken off from the exposure area and to be subject to medical examination;**
- ✓ **The increased exposure is prohibited for men under 30 and for women.**

# Increased Planned Exposure, cont.

**BSS:**

Tasks	Guidance value
Life saving actions	$H_p(10) < 500 \text{ mSv}$ This value may be exceeded under circumstances in which the expected benefits to others clearly outweigh the emergency worker's own health risks, and the emergency worker volunteers to take the action and understands and accepts this health risk
Actions to prevent severe deterministic effects and actions to prevent the development of catastrophic conditions that could significantly affect people and the environment	$H_p(10) < 500 \text{ mSv}$
Actions to avert a large collective dose	$H_p(10) < 100 \text{ mSv}$

# Increased Planned Exposure, cont.

Emergency workers performing activities under conditions when the dose can **exceed 50 mSv**

- are to be **volunteers**;
- have to pass **medical examination**;
- to be clearly and comprehensively **informed in advance** of the associated health risk;
- to go through **preliminary training**;
- to sign **a written consent**.



**Law of Ukraine “On Individuals Protection against the Impact of Ionising Radiation”**

# Emergency Plans

- an integral part of the licence;
- to be approved by the state regulatory bodies;
- is subject to updating and reviewing on a regular base;
- is to include: information on responsibilities of officials for general management, individual and collective dosimetric control, medical control, informing emergency workers, etc.; organisational and technological charts on conducting emergency work; procedures on exchange of information; procedures on planning doses for the emergency workers; standard emergency scenarios; measures on accumulation of emergency stocks, etc.

# NPP Emergency Plans

The basic measures on protecting emergency workers:

- administration and surveillance over non-exceeding the radiation-hygienic regulations that limiting personnel exposure;
- timeliness of introduction for protective countermeasures;
- conducting radiation survey in the NPP premises and on the site;
- conducting dosimetric control;
- providing radio-protectors and stimulators of radio-resistance;
- sheltering and evacuation;
- medical assistance.



# NPP Emergency Plans

## Criteria for introduction of protective measures

Regime	Dose rate ( $\gamma$ ), mR/h (nGy/s)	Averted calculated dose for the period of 14 days, mSv	Protecting measures
1	>2,5 (6,9)	2 whole body 100-300 thyroid gland	Restriction on staying outdoor Iodine prophylaxis
2	>6,3 (17,4)	5 whole body 50-300 thyroid gland	Sheltering Iodine prophylaxis
3	>62,5 (173,6)	50 whole body 300 thyroid gland	Evacuation Iodine prophylaxis
4	>625,0 (1736,0)	500 whole body 1000 thyroid gland	Urgent evacuation Iodine prophylaxis

# NPP Emergency Plans

## Radiation survey



### Main tasks:

- to assess radiation situation inside the buildings, on- and off- the NPP site;
- to define locations of contamination;
- to confirm radiation parameters necessary for the accident classification;
- to clarify conditions and continuation of emergency work, routes of the staff transportation, protective measures for emergency workers.

# NPP Emergency Plans

## Dosimetric control

Main tasks:



- disclosing facts of radionuclides intake during emergency activities;
- preventing overexposure of emergency workers;
- documenting factual doses of emergency workers;
- reconstruction of doses obtained by emergency workers accidentally (out of control);
- thorough investigation and accurate assessment of doses.



# NPP Emergency Plans

## Measures on prophylaxis of external and internal exposure of the personnel

- Decision on administering stable iodine tablets is to be made by the NPP's shift supervisor (or the head of the Emergency Headquarter);
- The personnel of the Unit in emergency is to take the stable iodine tablets immediately after declaring emergency of the classes "Site area emergencies" or "Facility emergencies", when "General emergency" declared, taking of the stable iodine is mandatory for the staff of the whole NPP;
- Requirements to the amount of stable iodine tablets to be stored, persons responsible for stable iodine administration, places where the tablets are stored.

# NPP Emergency Plans

## Sheltering and evacuation

- sheltering facilities are to be arranged;
- location of sheltering facilities;
- capacity of sheltering facilities
- a person responsible for accommodating people;
- evacuation routes;
- gathering points.

# NPP Emergency Plans

## Internal and external emergency centres

Main functions of the NPP  
Emergency Centres related to  
protecting emergency workers:

- management of actions on radiation protection of the personnel;
- management of search and rescue actions;
- management of action on providing emergency medical care and medical control.



# NPP Emergency Plans

## Decontamination

- special sanitary checkpoints arranged in the sanitary units on the premises of each NPP;
- sanitary gateways (fixed and transferable) for preliminary decontamination;
- special points for decontamination of transport and equipment;
- special containers and collectors for radioactive waste.



# NPP Emergency Plans

## Medical protection

### Main tasks:

- administering first medical aid;
- delivering pre-hospital medical care;
- carry out triage and transportation of casualties;
- delivering qualified and special medical assistance.





# Lessons Learnt from the Fukushima Accident

- The legislation in Ukraine concerning protecting emergency workers has not experienced significant changes;
- Some amendments were introduced in the Standard Emergency Plan for NPPs of Ukraine, an emergency plan for each NPP was reviewed;
- Measures on ensuring inhabitability of control rooms and reserve control rooms were implemented;
- Additional exercises at all NPPs based on the scenarios of events caused by extreme natural disasters were conducted.

# Roles of the SSTC NRS in Emergency Preparedness and Response

- an expert support to the decision making process;
- developing scenarios and participating in emergency exercises;
- support of the regulator in development of legislation aimed at prevention of emergencies, in supervision of enterprises for their compliance with the nuclear and radiation safety requirements aimed at prevention of accidents;
- expert review of normative documentation;
- mobile laboratory radiation survey.



# Conclusion

- Ukrainian legal and regulatory framework for protecting emergency workers is in place and generally correlates with the international standards;
- Review of the Ukrainian legal and regulatory framework on compliance with a **COUNCIL DIRECTIVE 2013/59/EURATOM laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation** will be done in accordance with provisions of the Association Agreement.



***Thank you for  
your attention!***