



1. Background and Goal of the present work

Due to Fukushima accident the process of strengthening and developing of emergency preparedness and response regulations and guides, was considerably enhanced. As a part of this process safety guide "Arrangements for minimizing of cross-contamination of areas, traffic routes and vehicles. Traffic and decontamination arrangements" (further – RB-084-13), was issued. This document provide guidance on meeting the Russian regulatory requirements on emergency preparedness. It's also consistent with point 4.91 of GS-R-2 according to which arrangements shall be made for monitoring the contamination levels of vehicles and personnel moving into and out of contaminated areas. Main features of RB-084-13 are presented below.

2. Scope

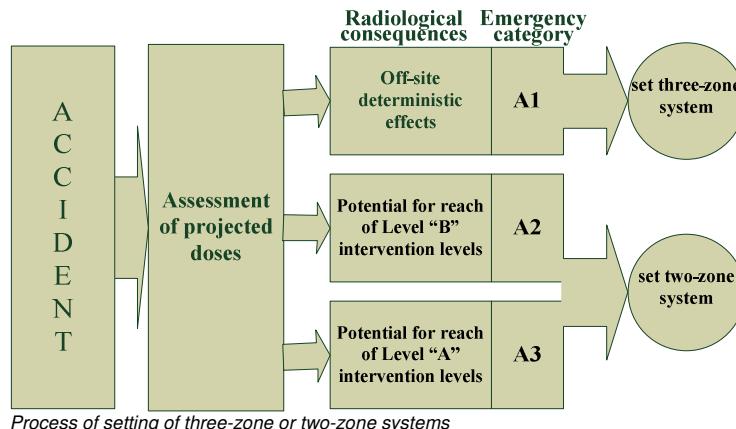
Guidance of RB-084-13 applicable for reactors, SNF storage facilities and reprocessing plants, radwaste and radioactive material storage facilities, where off-site emergency response may be required.

The RB-084-13 contains guidelines on default zoning, which should be established before radiological survey results become available, and on protective actions which should be taken based on established zoning.

The RB-084-13 applicable after occurrence of accidental release, when the further releases are excluded.

3. Grading of zoning scale depending on projected radiological consequences

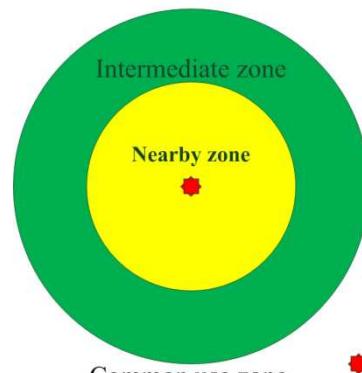
The RB-084-13 contains the criteria for setting of two- or three-zone system. These criteria are related to emergency categories, established in Russian regulatory requirements NP-004-08 and NP-047-03, and correspond to off-site radiological consequences, which usually assessed on ad-hoc basis.



Level "A" (for A2 emergency category) and level "B" (for A3 emergency category), are consequently correspond to ICRPs Publication № 63 "almost always justified" intervention level and 10 % of "almost always justified" level, which are to be used to reduce the occurrence of stochastic effects in the population at present and in the future.

According to Russian basic radiation safety standard NRB-99/2009, issued by Social welfare service, these intervention levels are obligatory for emergency planning purposes.

Three-zone system



Two-zone system

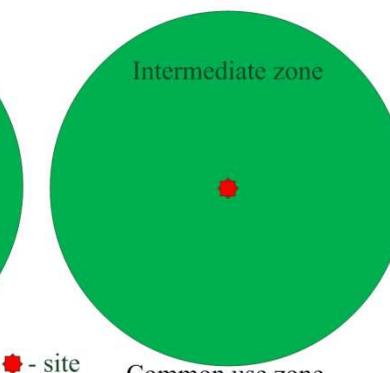


Illustration of three-zone or two-zone systems

Outer boundary of intermediate zone matches to inner boundary of common use zone. Common use zone unlike the intermediate zone is not limited by any outer perimeter.

7. Conclusions and Acknowledgements

- Safety guide "Arrangements for minimizing of cross-contamination of areas, traffic routes and vehicles. Traffic and decontamination arrangements" is issued and enacted.
- This document facilitates the implementation of arrangements on minimization of cross-contamination of areas, traffic routes and vehicles during post-accident phase and assist the compliance with variety of Russian regulations on emergency preparedness.

4. Zone sizing for three-zone system and two-zone systems

Recommendations of IAEA EPR series document "Method for Developing Arrangements for Response to a Nuclear or Radiological Emergency (EPR Method-2003)" on predefined emergency zones and radius sizes used as a basis for defining sizes of zones in RB-084-13.

Facilities	Nearby zone radius, km	Intermediate zone radius, km
Reactors of I and II threat category		
Thermal power $P > 1000$ MW	3-5	25
Thermal power $P = 100\text{--}1000$ MW	0,5-3	5-25
Thermal power $P = 10\text{--}100$ MW	– 1)	0,5-5
Thermal power $P = 2\text{--}10$ MW	– 1)	0,5
SNF storage facilities		
I	5	25
II	– 1)	5
SNF reprocessing plants		
I	5	25
II	– 1)	5
Radwaste storage facilities		
$A/D_2 \geq 10^5$	3-5	25
$A/D_2 \geq 10^4 \cdot 10^5$	0,5-3	5-25
$A/D_2 \geq 10^3 \cdot 10^4$	– 1)	0,5-5
$A/D_2 \geq 10^2 \cdot 10^3$	– 1)	0,5

Notes: 1) setting of nearby zone isn't required

Zone sizing for three-zone system and two-zone systems

5. Measures for minimizing of cross-contamination based on three-zone system

In case of setting of three-zone system in RB-084-13 urges to fulfil following measures in the direction where wind was mostly blowing:

- prevention of traffic from nearby zone to intermediate zone;
- implementation of following measures in nearby zone:
 - ✓ limiting of traffic speed by 30 km/h;
 - ✓ washing-off sediments from traffic routes to roadside;
 - ✓ immobilization of washed-off sediments with special reagents;
 - ✓ far away from routes relocation of radioactive sediments which are result of washing-off;
 - ✓ setting caution signs, which prohibit crossing of roadside and staying on it, along the traffic routes;
 - ✓ keeping in nearby zone responder vehicles, which couldn't be used anymore due to contamination;
 - ✓ substitution of such vehicles by "clear" vehicles from outside of nearby zone;
- arrangement of transfer of people between vehicles when entering from nearby zone to intermediate zone and from intermediate zone to nearby zone;
- setting decontamination points where traffic routes cross boundaries of nearby zone and intermediate zone;
- allowing entering the people and traffic from intermediate zone to common use zone based only on monitoring results.

6. Measures for minimizing of cross-contamination based on three-zone system

In case of setting of three-zone system in RB-084-13 urges to fulfil following measures in the direction where wind was mostly blowing:

- ✓ limiting of traffic speed by 30 km/h
- ✓ washing-off sediments from traffic routes to roadside
- ✓ immobilization of washed-off sediments with special reagents
- ✓ far away from routes relocation of radioactive sediments which are result of washing-off
- ✓ setting caution signs, which prohibit crossing of roadside and staying on it, along the traffic routes
- ✓ substitution of such vehicles by "clear" vehicles from outside of nearby zone.