REPUBLIC OF SLOVENIA
MINISTRY OF THE ENVIRONMENT AND SPATIAL PLANNING
SLOVENIAN NUCLEAR SAFETY ADMINISTRATION

Transboundary Aspects of Emergency Preparedness and Response

SLOVENIA

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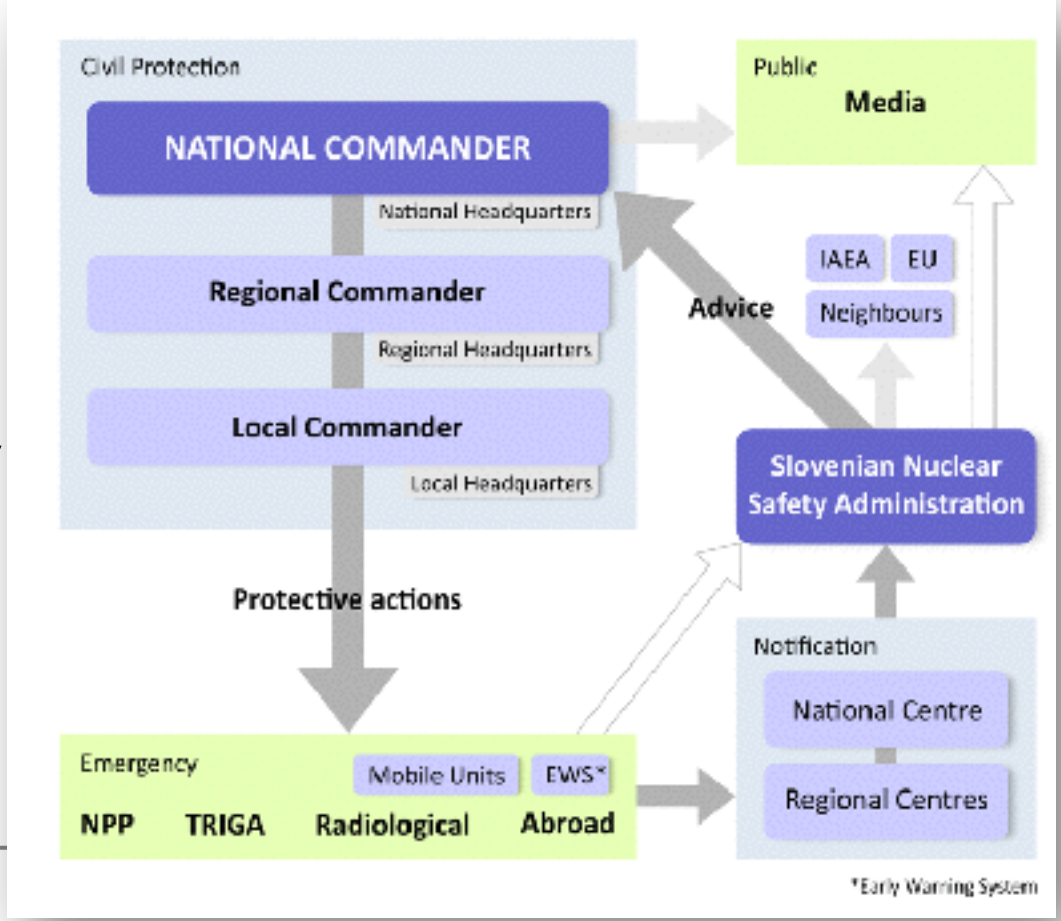
The Krsko NPP

The Krsko NPP

- Westinghouse PWR
- 2 loop
- 700 MWe
- In operation since 1983
- Ownership 50:50 Slovenia-Croatia

EPR in Slovenia

- National plan for nuclear & radiological emergencies
- National Commander of Civil Protection is in charge
- SNSA is competent authority



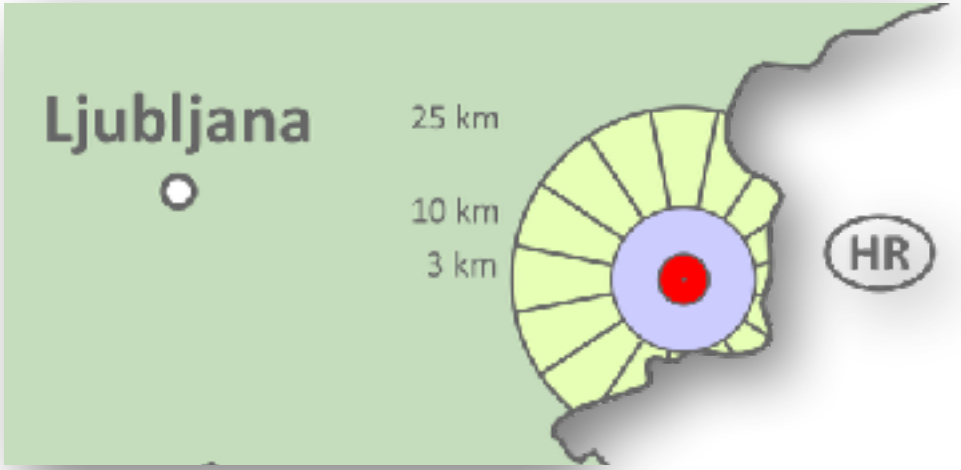
Protection strategy for NPP

- **Emergency Classification**
  - Level 0: Unusual Event
  - Level 1: Alert
  - Level 2: Site Emergency
  - Level 3: General Emergency

- **Emergency Planning Zones**
  - 3 km :: Precautionary
  - 10 km :: Urgent
  - 25 km :: Extended
  - Whole country

Protection strategy for NPP

- **Evacuation**:
  - when General emergency, 3 km and then 10 km
- **Sheltering**:
  - only if safe evacuation not possible
- **Iodine thyroid blocking**:
  - in parallel with evacuation or sheltering
  - pills are pre-distributed in 10 km
  - stockpiled for the rest of Slovenia



- Food, milk and drinking water restrictions, inadvertant ingestion ...
- Protective actions in 25 km and beyond based on measurements and models

Challenges after 2011

Are sizes of our EPR zones appropriate?

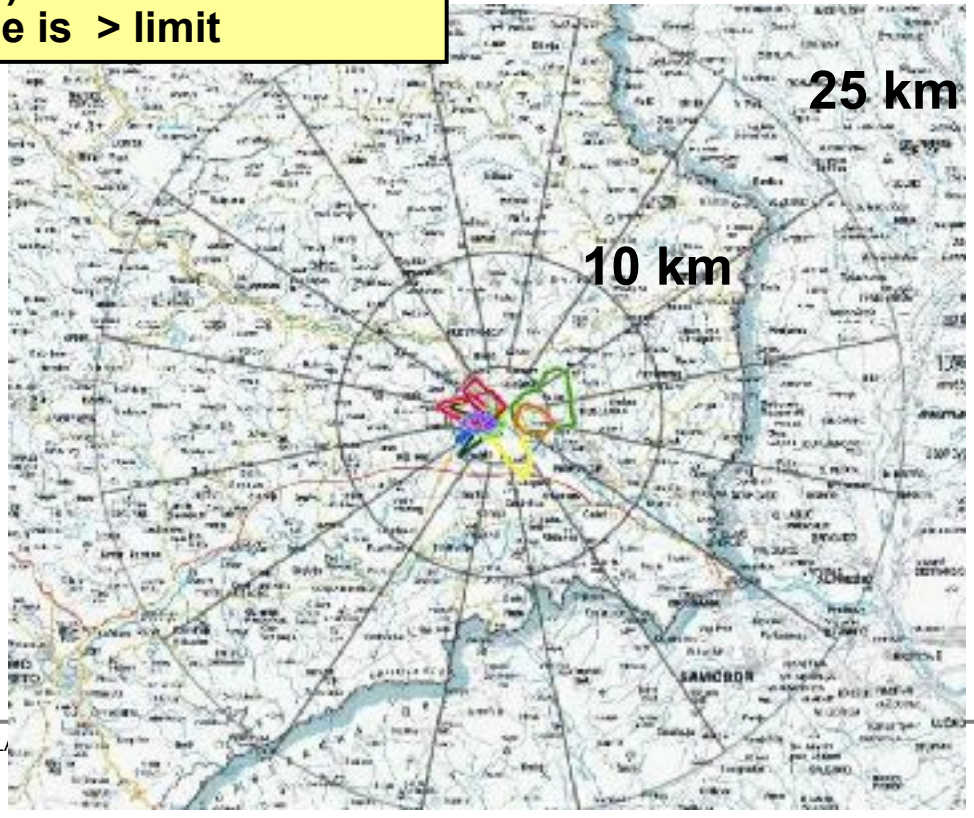
Harmonization with Croatia

Severe accident analysis by SNSA

- Modeling of releases using RODOS
- Real weather on the day of analysis
- Different source terms
- With and without containment filters, installed in 2013

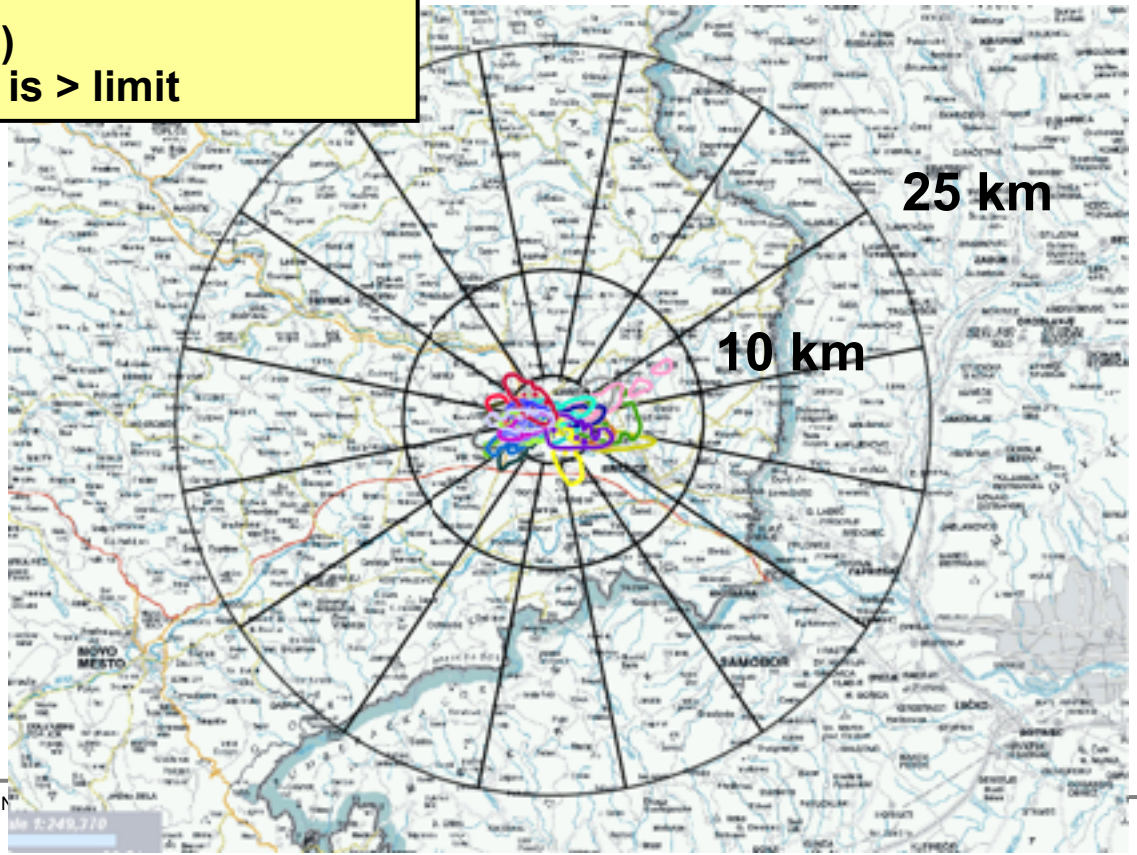
Severe accident consequences - RODOS

No filters
1 % core inventory (Iodine)
Areas where effective dose is > limit



Severe accident consequences - RODOS

With filters
50 % core inventory (Iodine)
Areas where effective dose is > limit

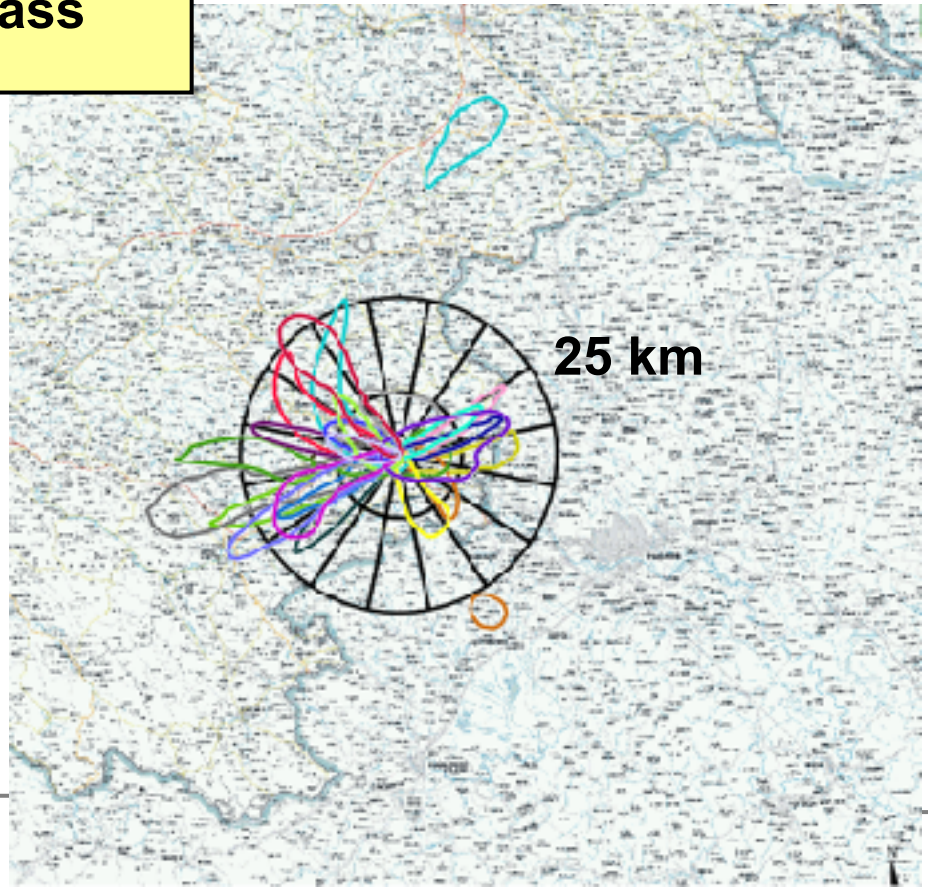


Severe accident consequences - RODOS

10 SG U-tubes break, filter bypass
Areas where effective dose is > limit

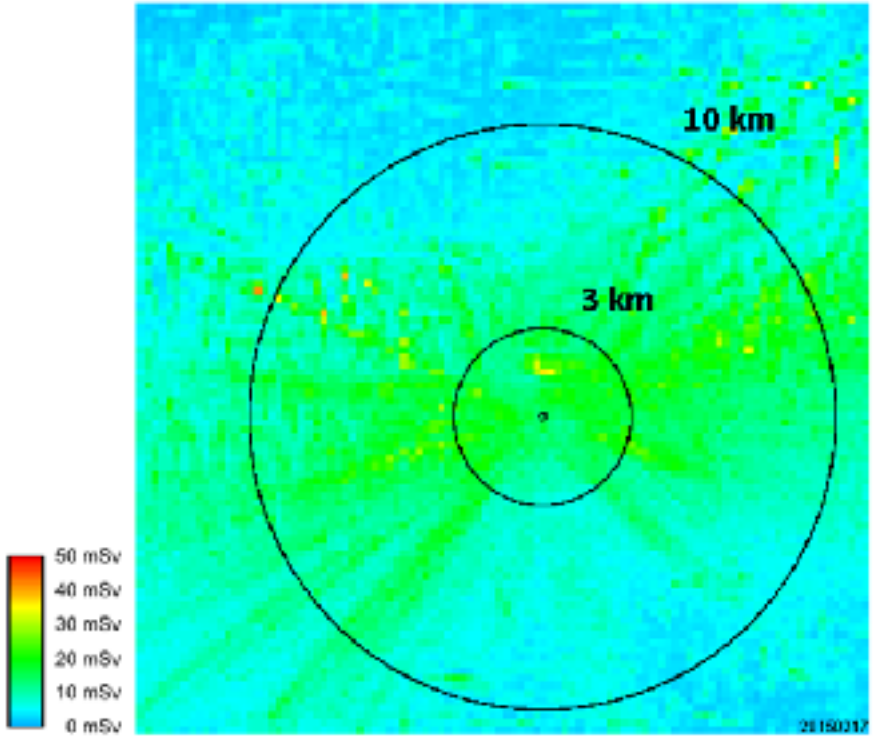
Very low probability:

- $5.2 \cdot 10^{-7}$
- 1.2% of all releases



Severe accident analysis by NPP

- Filtered release
- MAAP + dispersion model
- Scenario repeated with weather data every hour in the year
- 365 x 24 = 8760 results
- Max effective doses for 2 days in a year are shown
- 10 km zone could be even reduced!



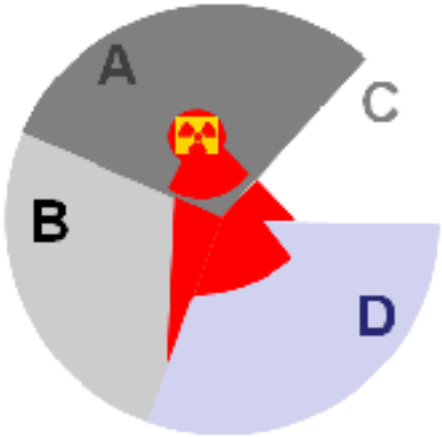
1. Are sizes of our EPR zones appropriate?

- Yes , they could be even smaller, but
- … we decided to be conservative and keep the same planning zones
- To be even more conservative we are removing sectors in 10 km zone and will evacuate the whole zone

2. Harmonization with Croatia

The problem

- Different emergency planning zones
- Communication across the border was poor
- In case of emergency authorities would act differently!



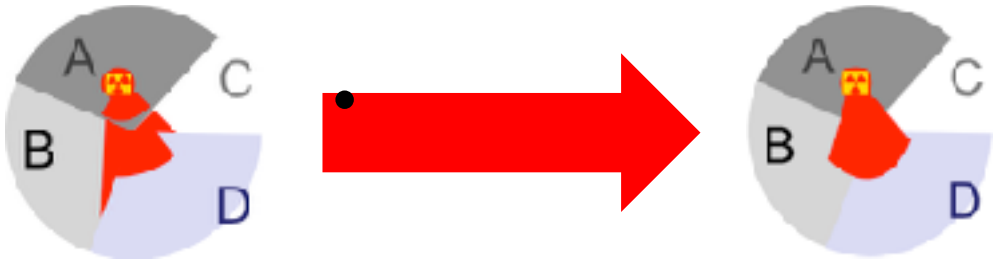
HERCA - WENRA Approach

2. Harmonization with Croatia

The solution

Commitment on both sides to harmonize:

- Understanding of Emergency Plans on both sides
- Direct communication during emergency
- To order compatible protective actions



HERCA - WENRA Approach

2. Harmonization with Croatia

INEX 5 Exercise in March 2016

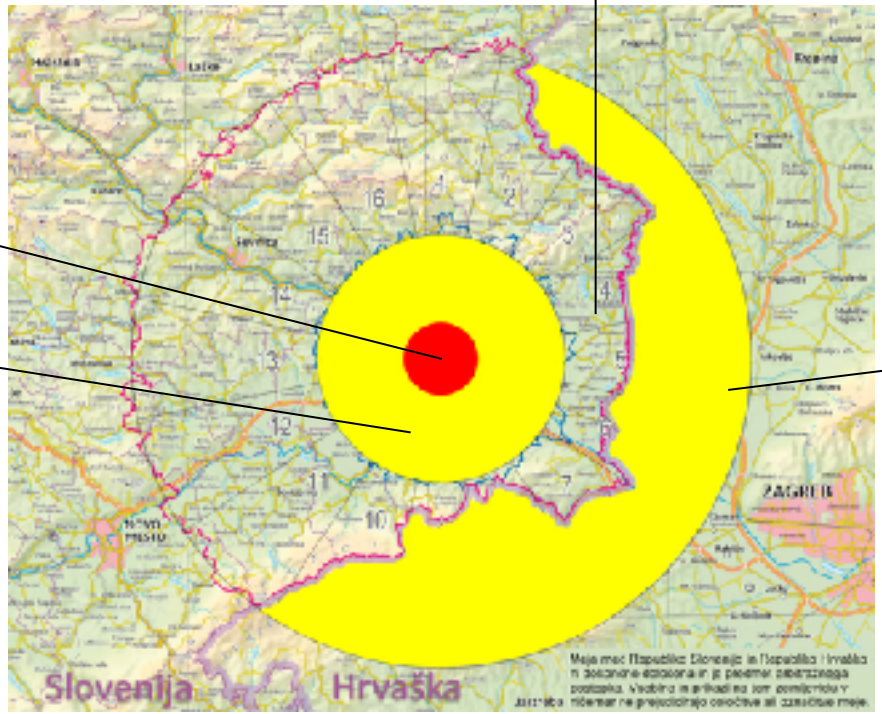
- For the first time Croatian authorities had full access to communication system of Slovenian authorities - MKSID
- In Slovenia sheltering was within 10 km around NPP
- … while in Croatia sheltering was ordered within 25 km

Protective actions during INEX 5

?????

Evacuation

Sheltering



Sheltering

For the end

There were improvements …

… but we need to do more!