

# Test Cases for SAFRAN Application ChNPP Site – RW Management and Decommissioning



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# ChNPP



# Project

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Dismantling of equipment in turbine hall of the ChNPP I-st stage

Tasks for solution

- Development of working plans
- Definition of waste streams
- Treatment, storage, clearance
- Radiation protection
- Reporting

# Facilities and activities

## Existing Data

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- ❑ Building of turbine hall of the ChNPP I-st stage:  
length - 408 m, wise - 51 m, high - 28,55 m
- ❑ Equipment is shut down and emptied
- ❑ Detailed information of the equipment for dismantling and premises is available in Comprehensive engineering radiological investigation results
- ❑ This information contains
  - Amount of materials
  - Activity on equipment and building structures
  - Dose rate
  - Estimated amount of not radioactive materials

# Facilities and activities

## Existing Data

Comprehensive engineering radiological investigation data

Amount of materials		stainless steel		Steel		cast		Non-ferrous metals	
W, t	V, m <sup>3</sup>	W, t	V, m <sup>3</sup>	W, t	V, m <sup>3</sup>	W, t	V, m <sup>3</sup>	W, t	V, m <sup>3</sup>
36620	104450	5234	6838	27884	86810	155,6	226	3346	10576

# Facilities and activities

## Existing Data

Comprehensive engineering radiological investigation data

Equipment of unit 2	Total activity, Bq	Cs	Co	Sr	others
Total	3,53 E+10	3,26 E+10	1,44 E+09	1,11 E+09	1,79 E+08
Inside	1,04 E+10	9,62 E+09	4,30 E+09	3,31 E+08	3,93 E+07
outside	2,49 E+10	2,29 E+10	1,01 E+09	7,81 E+08	1,39 E+08

# Facilities and activities

## Existing Data

Comprehensive engineering radiological investigation data

Building structures	Total activity, Bq	Cs	Co	Sr	others
Turbine	6,48 E+10	6,00 E+10	2,15E+09	1,43 E+09	1,21 E+09
inside	1,11 E+10	1,03 E+10	4,59 E+08	3,38 E+08	3,93 E+07
outside	5,37 E+10	4,97 E+10	1,69 E+09	1,09 E+09	1,17 E+09

# Facilities and **activities**

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- Dismantling
- Fragmentation
- Sorting for further treatment
  - RAW
  - valuable materials (stainless steel, non-ferrous metals)
  - not contaminated materials
- Decontamination
- RW management

# Facilities and activities

## Organization of dismantling activities

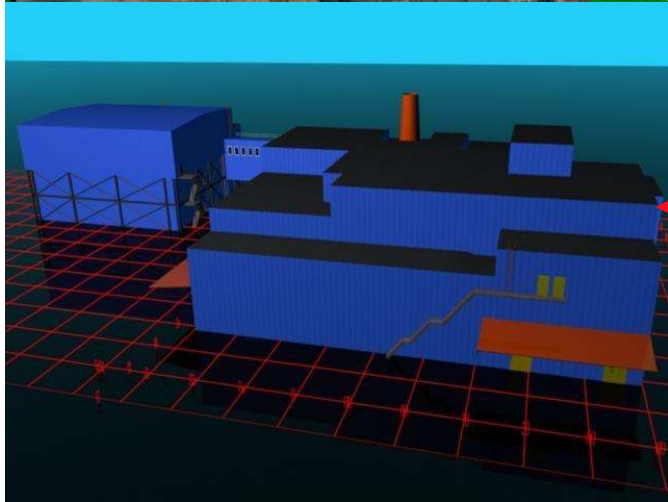
- places for fragmentation, decontamination, compacting, RW management, temporary storage for dismantled equipment
- necessary equipment
- electricity supply
- water supply
- ventilation
- place for clearance
- sanitary barriers
- radiation protection means
- records keeping

# Expected waste streams

LLW		Clean		Total	
16898,3 t	50161,1 m <sup>3</sup>	561,4 t	2071,9 m <sup>3</sup>	17460 t	52233 m <sup>3</sup>
96%		4%		100%	

# Technological complex for ChNPP RW management

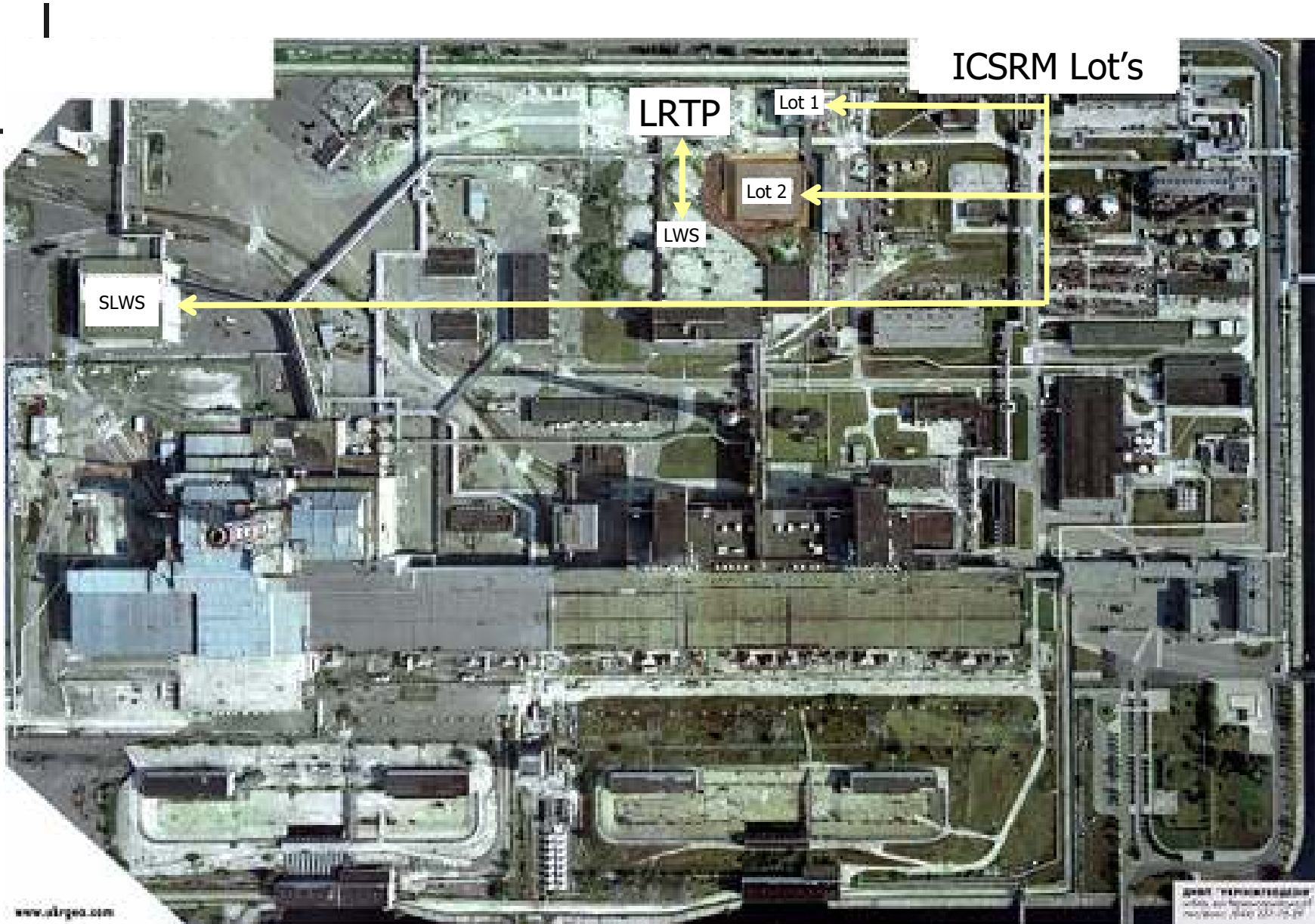
Development under  
international cooperation



- **Liquid RW Treatment Plant – LRTP**
- **Industrial Complex for Solid RW Management - ICSRM**
- **Lot 1** retrieval facility of solid RW from existing solid RW storage facility
- **Lot 2** solid RW reprocessing facility
- **Lot 3** engineered near-surface disposal facility for low and intermediate level, short-lived conditioned RW

LRTP  
Lot 1,2  
Lot 3

# ORIENTED INFRASITEL VIEW (new facilities)



# L RTP (building and main technological hall)



# ICSRM (Lot 1,2)



# ICSRM (Storage for LIL-LL and HL waste)



# Test cases input\output

- Foreseen in IAEA\Ukraine cooperation plans
- Safety Assessment reports of facilities exist
- Data could be used for the test cases
- Ukrainian operators, regulators and experts skill improving