



РАДИОАКТИВНЫЕ ОТХОДЫ – ПОД ГРАЖДАНСКИЙ КОНТРОЛЬ!

# How are the threats on Ukrainian NPPs reflected in Russia?



*Andrey Ozharovsky, nuclear engineer,  
Russian Radioactive Waste Safety Program  
+7-905-5771240  
Telegram: <https://t.me/Ozharovsky>*

*December 7, 2022*

*Nuclear Power in the Age of New Threats*



Ожаровский Андрей  
Вячеславович, инженер-физик  
(МИФИ, 1989 г.).

Член Российского Социально-  
Экологического Союза (РСоЭС).

Постоянный автор сайта  
Bellona.ru

+7-905-5771240 (Telega)

Facebook:  
andrey.ozharovsky

idc.moscow@gmail.com

Со-автор ряда докладов по  
проблемам атомной энергетики.

Участник десятков  
общественных слушаний в  
России и других странах, а  
также в Беларуси, Украине,  
Австрии.

# Is that safe to quote IAEA?

**Derestricted 15 September 2022**

*(This document has been derestricted at the meeting of the Board on 15 September 2022)*



**IAEA**

*Atoms for Peace and Development*

**Board of Governors**

**GOV/2022/58**

Date: 15 September 2022

Original: English

**For official use only**

Item 9 of the agenda  
(GOV/2022/55)

**The safety, security and safeguards implications  
of the situation in Ukraine**

**Resolution adopted on 15 September 2022 during the 1647th session**

# Is that safe to quote IAEA?

1. Expresses grave concern that the Russian Federation has not heeded the call of the Board to immediately cease all actions against and at nuclear facilities in Ukraine;
2. Deplores the Russian Federation's persistent violent actions against nuclear facilities in Ukraine, including forcefully seizing of control of nuclear facilities and other violent actions in connection with a number of nuclear facilities and other radioactive materials and the ongoing presence of Russian forces and Rosatom personnel at the Zaporizhzhya Nuclear Power Plant, which continue to pose serious and direct threats to the safety and security of these facilities and their civilian personnel, thereby significantly raising the risk of a nuclear accident or incident, which endangers the population of Ukraine, neighbouring States and the international community;

# Is that safe to quote IAEA?

3. Calls upon the Russian Federation to immediately cease all actions against, and at, the Zaporizhzhya Nuclear Power Plant and any other nuclear facility in Ukraine, in order for the competent Ukrainian authorities to regain full control over all nuclear facilities within Ukraine's internationally recognized borders, including the Zaporizhzhya Nuclear Power Plant, to ensure their safe and secure operation, and in order for the Agency to fully and safely conduct its safeguards verification activities, in accordance with Ukraine's Comprehensive Safeguards Agreement entered into force pursuant to the Treaty on the Non-Proliferation of Nuclear Weapons and the Statute;
4. Supports the Director General's and Secretariat's ongoing efforts to address the nuclear safety, security and safeguards implications of the current situation in Ukraine, including through the ISAMZ and the continued physical presence of Agency technical experts at Zaporizhzhya Nuclear Power Plant;
5. Emphasizes the importance of nuclear safety and security regarding peaceful nuclear facilities and materials in all circumstances, including in armed conflict, and of the IAEA Director General's 'seven indispensable pillars on nuclear safety and security' derived from IAEA safety standards and nuclear security guidance;
6. Encourages Member States to respond to assistance requests from Ukraine, including through the provision of necessary equipment through the Agency or on a bilateral basis; and
7. Requests that the Director General continue to closely monitor the situation and report formally to the Board on these matters as long as required.



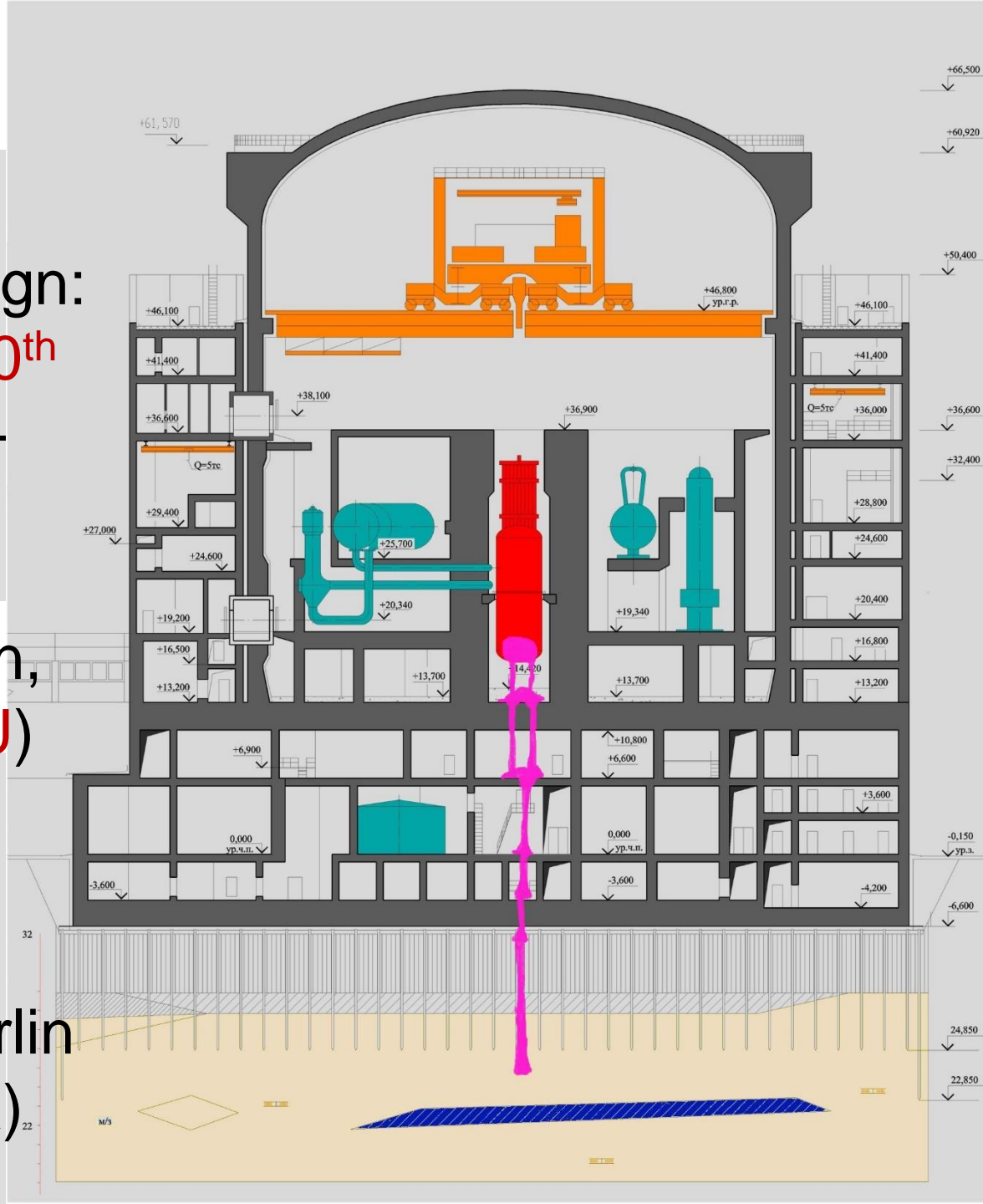
# VVER-1000 basic information

# VVER-1000

Old Soviet Union design:

- Project starts – 1950<sup>th</sup>
- Mass construction – 1970-80<sup>th</sup>

Novovoronezh, Kalinin,  
Balakovo, Rostov (RU)  
Zaporizje, Rivno,  
Khmelnitsky,  
Southukraine (UA),  
Kozloduy (BG), Temerlin  
(HU), Tyanvan (China)

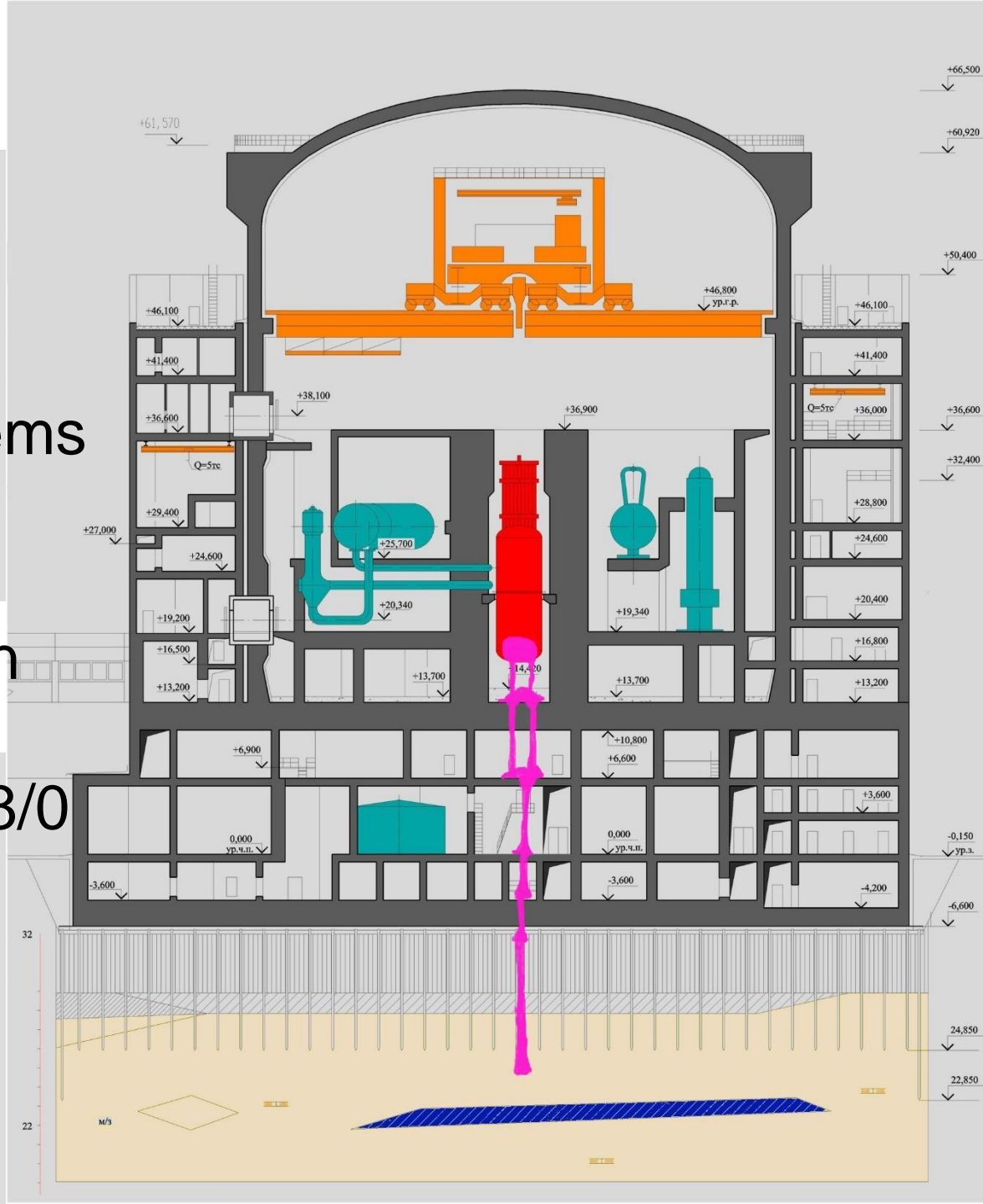


# VVER-1000

Single containment;  
No core catcher;  
Cooling towers problems  
(Rostov NPP);

5,5 hours till meltdown  
(EIA of Rostov NPP -  
<https://bellona.ru/2018/04/26/vver-1000/> )

Emergency generator  
will not help





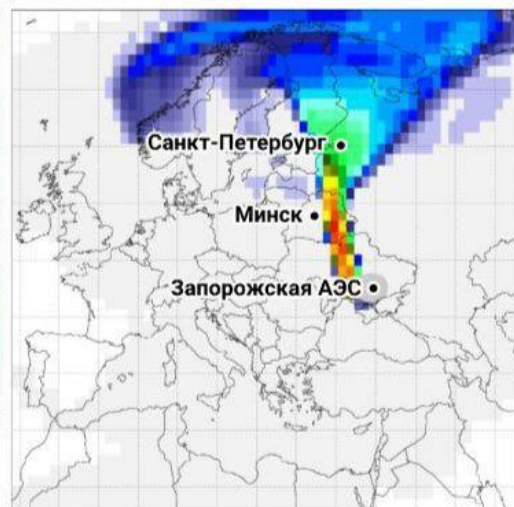
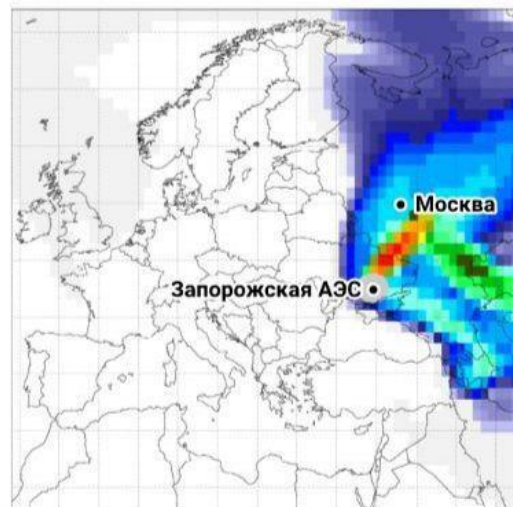


Is it possible to talk about the risks and danger of a nuclear power plant **in Russia** ?  
Yes, but only if it is a nuclear power plant **outside Russia...**

What is the size of a possible  
nuclear disaster at ZNPP? —  
Same as at any other NPP with  
old VVER-1000!

## «Возможные последствия повреждения первого блока Запорожской АЭС\*»

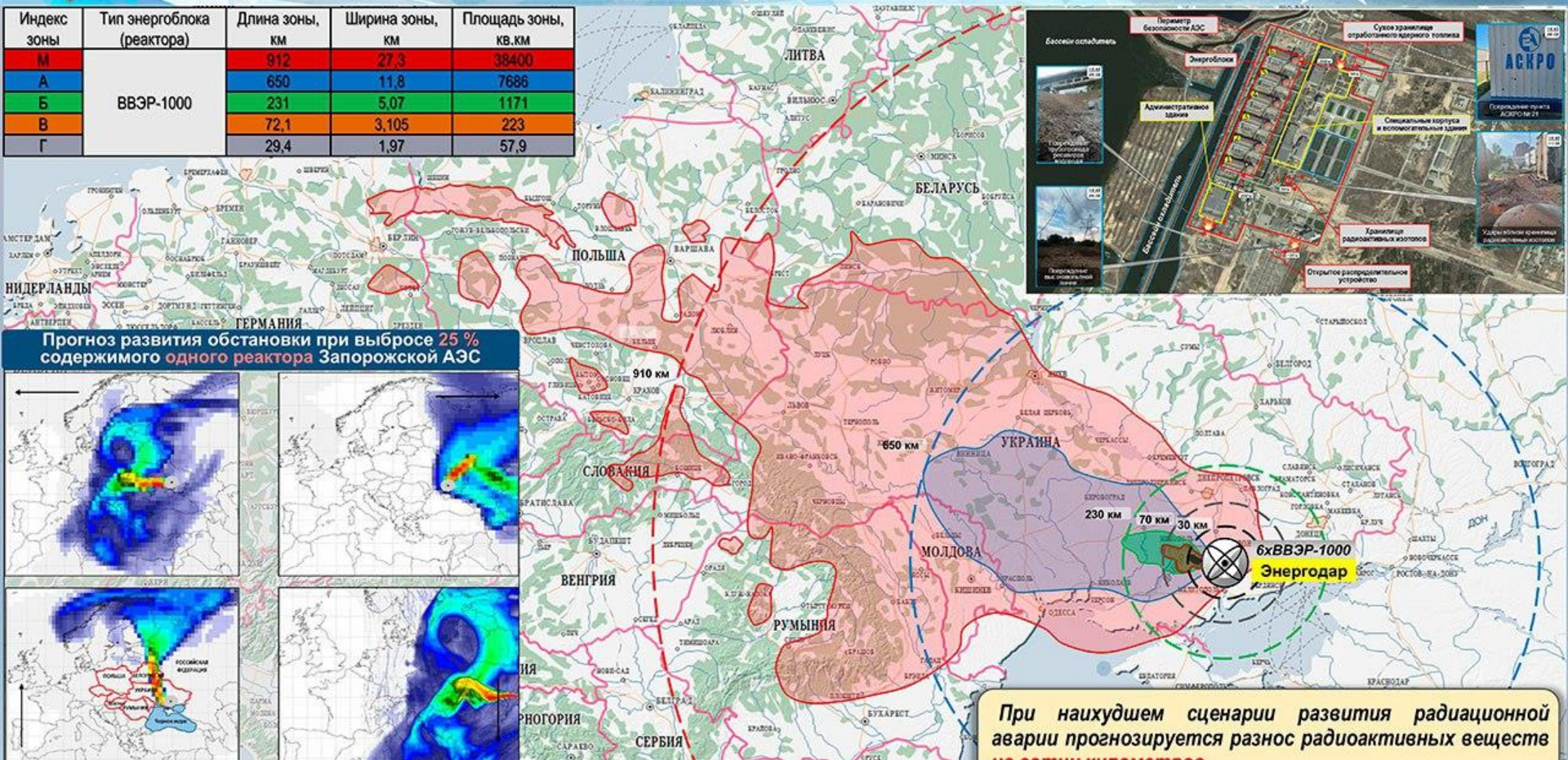
«Заражение почвы цезием-137»



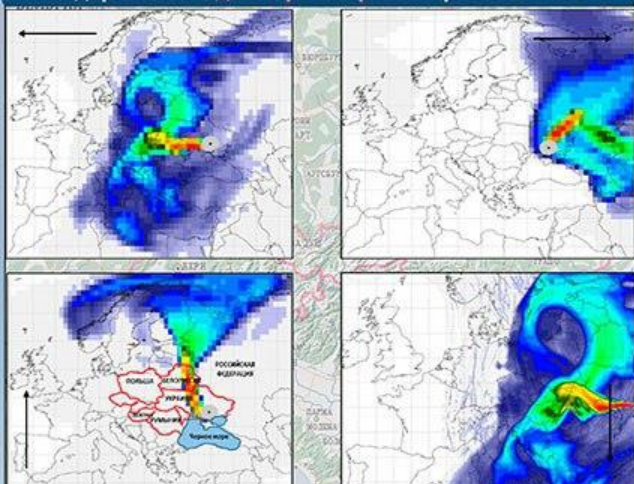
# What is the size of a possible nuclear disaster at ZNPP? – Same as at any other NPP with old VVER-1000!

## Прогноз возможных последствий радиационной аварии на Запорожской АЭС

Индекс зоны	Тип энергоблока (реактора)	Длина зоны, км	Ширина зоны, км	Площадь зоны, кв. км
М	ВВЭР-1000	912	27,3	38400
А		650	11,8	7686
Б		231	5,07	1171
В		72,1	3,105	223
Г		29,4	1,97	57,9

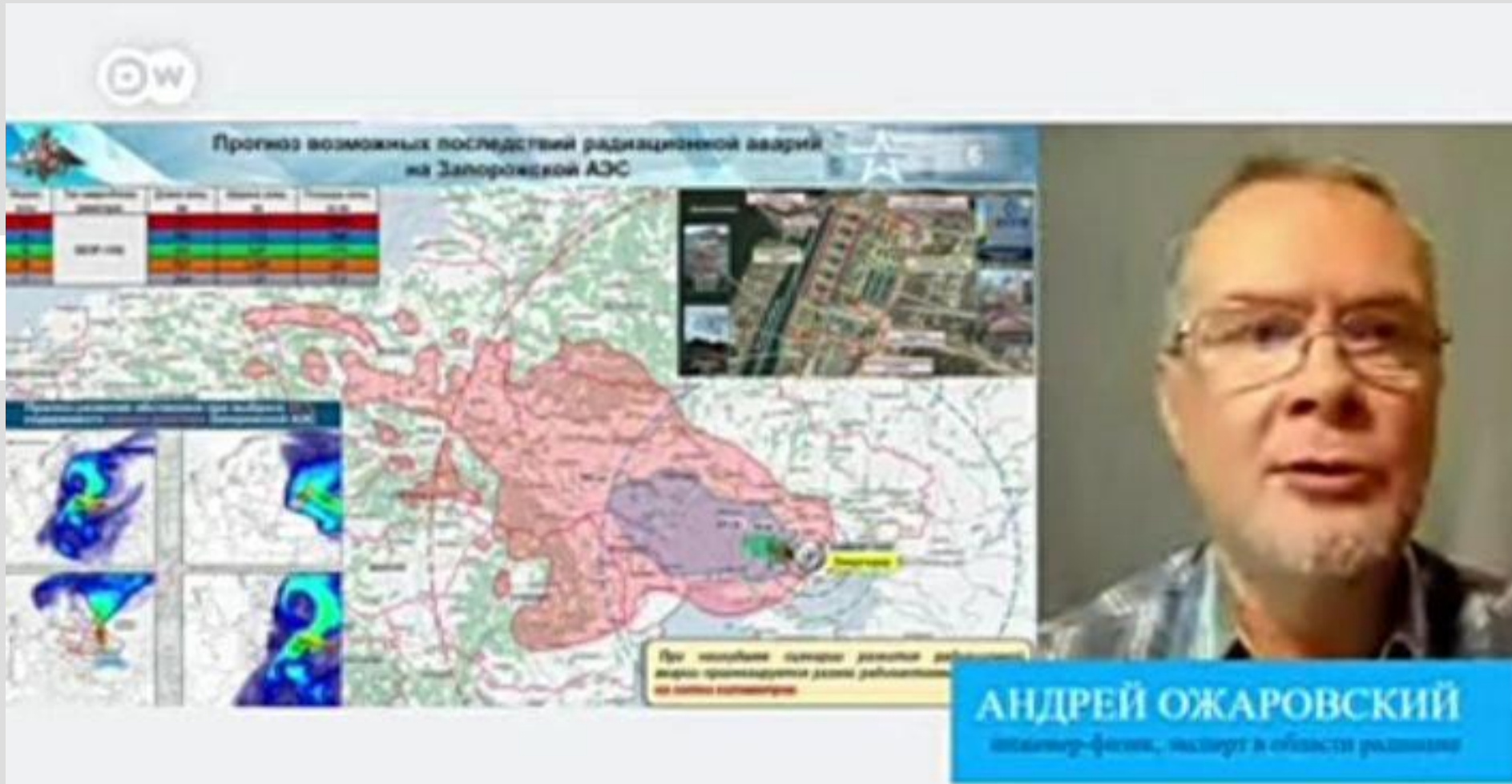


Прогноз развития обстановки при выбросе 25% содержимого одного реактора Запорожской АЭС



При наихудшем сценарии развития радиационной аварии прогнозируется разнос радиоактивных веществ на сотни километров

We use the FlexRisk data to spread information about risks of all the VVER-1000



Prognosis of possible consequences of a radiation accident at the Zaporizhzhia NPP

Distance from the NPP	Level of radiation exposure	Level of contamination	Level of risk
0 - 1000 m	1000 - 100000 Sv	1000000 - 1000000000 Bq/m <sup>2</sup>	Very high
1000 - 3000 m	100 - 10000 Sv	100000 - 100000000 Bq/m <sup>2</sup>	High
3000 - 10000 m	10 - 1000 Sv	10000 - 10000000 Bq/m <sup>2</sup>	Medium
10000 - 30000 m	1 - 10 Sv	1000 - 100000 Bq/m <sup>2</sup>	Low
30000 - 100000 m	0.1 - 1 Sv	100 - 10000 Bq/m <sup>2</sup>	Very low

АНДРЕЙ ОЖАРОВСКИЙ  
инженер-физик, эксперт в области радиации



# Оценка рисков АЭС

← → ↻ flexrisk.boku.ac.at

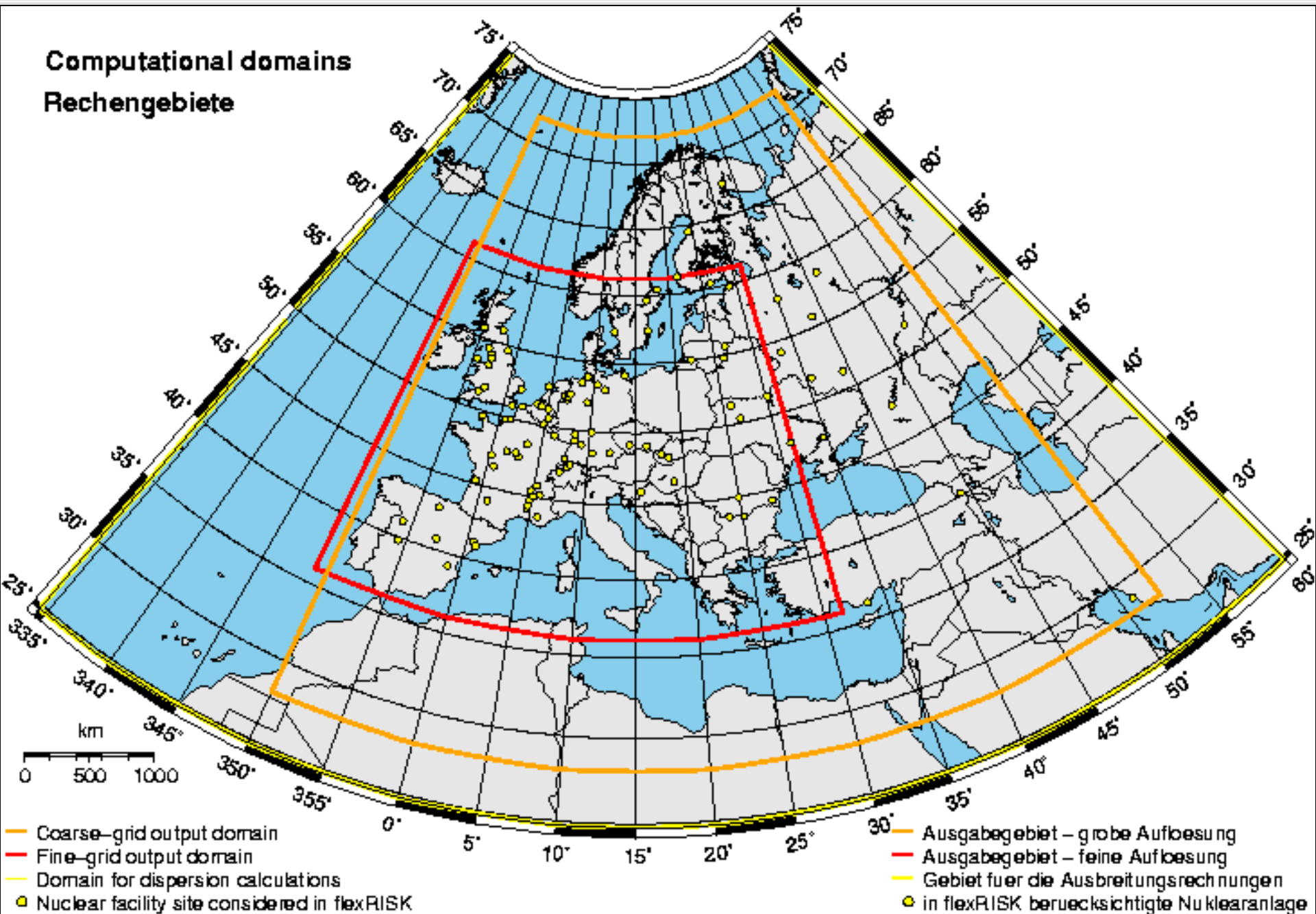
## flexRISK

Project: Flexible Tools for Assessment of Nuclear Risk in Europe

Projekt: Flexible Werkzeuge zur Abschätzung des nuklearen Risikos in Europa



# Computational domains Rechengebiete







# Conclusions

Nuclear power infrastructure is vulnerable both for terrorists' attack and in case of <traditional> war.

This is one more argument to get rid of nuclear power.



**РАДИОАКТИВНЫЕ ОТХОДЫ - ПОД ГРАЖДАНСКИЙ КОНТРОЛЬ!**

**Спасибо за внимание!**

