NEW NUCLEAR POWER PLANT
AT THE JASLOVSKÉ BOHUNICE SITE

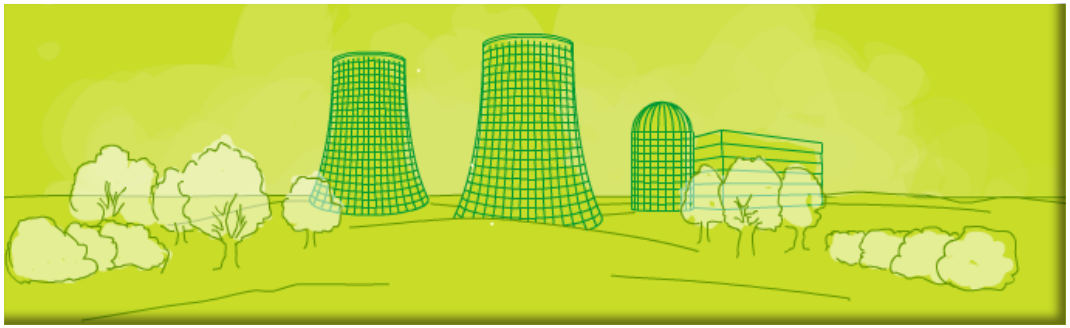
ENVIRONMENTAL IMPACT ASSESSMENT REPORT ON THE PROPOSED ACTIVITY

In accordance with § 31 and Annex No. 11 of the Act No. 24/2006 Coll. on the Environmental Impact Assessment

Transboundary consultation and public meeting
- 25.,26.11.2015 Munchen, Germany

PRESENTATION CONTENT

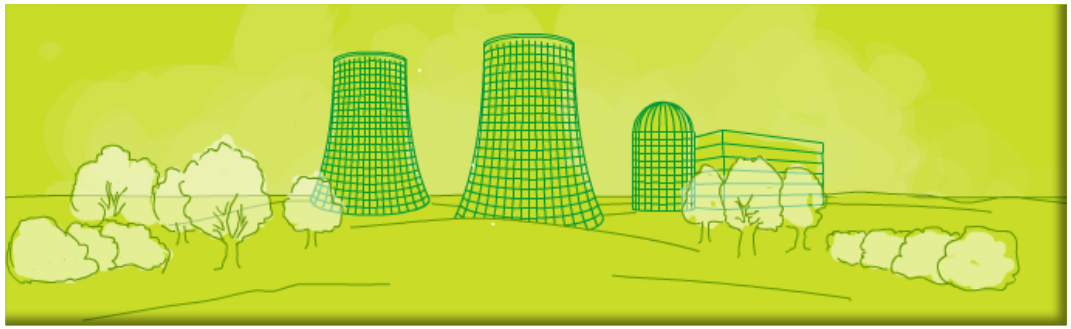
1. Introduction of the company and of a project NNPP
2. Basic parameters of NNPP, EIA process
3. The latest generation reactors safety characteristics
4. Results of the Environmental Assessment Report
5. Conclusion



CLIENT

- Jadrová energetická spoločnosť Slovenska, a. s. *(Nuclear Energy Company of Slovakia, ltd.)*
- JESS was founded to prepare the project of a new nuclear power plant in Jaslovské Bohunice.
- Jadrová energetická spoločnosť Slovenska, a. s., is a joint venture of the Slovak Jadrová a vyraďovacia spoločnost, a. s. (JAVYS) - *Nuclear and Decommissioning Company*, which owns 51% share and the Czech power group ČEZ which owns 49% share of the company.
- The vision of the company is to built a state-of-art nuclear power plant of the III+ generation with an objective to generate electricity safely and effectively as soon as possible.
- The mission of the company is to execute the project of the appropriate type of new nuclear power plant with consideration of maximum safety

minimum impact on the environment, ensuring the energy safety of Slovakia and economical effectiveness.



WHY A NEW NUCLEAR POWER PLANT

The need for the proposed activity is based on the requirements for ensuring the energy security of the Slovak Republic.

- The functions of all spheres of economy and living conditions of the population depend on the availability of electricity.
- The public interest in a reliable electricity supply is hence generally recognized; any potential deficiencies or failures in the electricity supply would affect the whole society.
- Launching a new power resource will enhance energy security, self-sufficiency and export-ability of Slovak Republic and contribute to optimum price policy and will further increase competition in the electricity market.

View of Nižná village (existing condition without NNPP, target state with NNPP)

MILESTONES OF THE PROJECT

Milestone	Activity
31.12.2009	Jadrová energetická spoločnosť Slovenska, a. s. – founding of company
July 2012	Feasibility Study prepared to evaluate key aspects of Project NNPP, forming a critical base for further consideration of the project.
September 2013	Launch of EIA process
10/2013 – 3/2016	EIA process
1. quarter of 2016	End of EIA process – Final Statement from MoE SR
2016	Land-use planning permission
↓	Decision on vendor/supplier
2021	Building permission
2021	Start of construction
2027	Test commissioning
2029	Operation
2089	60 years of operation
	Decommissioning

INFORMATION ABOUT THE PROPOSED PROJECT

New Nuclear Power Plant in Jaslovské Bohunice – comprising the construction of a new nuclear power plant including all associated building objects and technological facilities

The following elements form the project basis:

Power units:

Type: pressurized water reactor (PWR), generation: III+ (best available technique)
Installed electrical power (net): up to 1700 MW_e, designed in 1 unit

Power output:

Power output: overhead power lines 400 kV
Reserve power: overhead (or underground) power lines 110 kV

Water supply / discharge:

Water supply: underground pipelines, existing infrastructure
Discharge of waste and rain water: underground pipelines

SITING

Jadrová energetická spoločnosť Slovenska

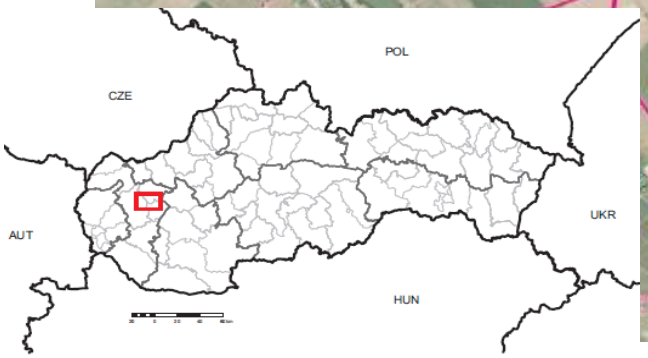
AREA FOR NJZ SITING

AREAS FOR THE CONSTRUCTION SITE EQUIPMENT

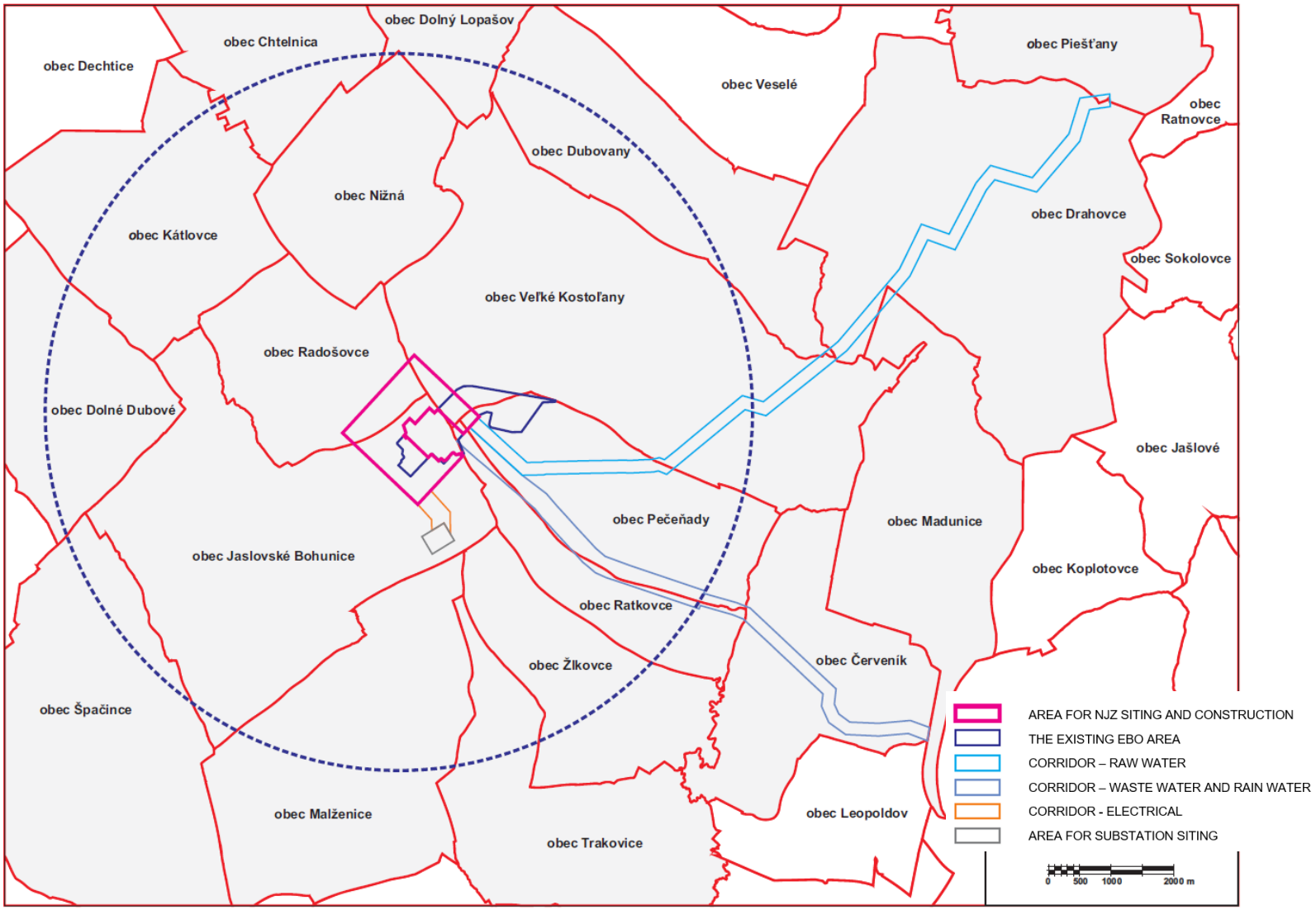
AREAS AND CORRIDORS OF TECHNICAL INFRASTRUCTURE

THE EXISTING EBO AREA

AREA FOR SUBSTATION SITING



CONCERNED MUNICIPALITIES



PROCESS OF ENVIRONMENTAL IMPACT ASSESSMENT

Legal framework

Act No. 24/2006 Coll., on the environmental impact assessment, as amended.

The law provides full compatibility with EU law and the international conventions to which the Slovak Republic is bound.

The EIA process comprises several sequential steps. The participants in the evaluation process are a town or village, the competent authority, other authorities concerned and the public.

Mandatory assessment consists of the following steps:

- EIA Notice/Preliminary report
- Comment procedure
- Decision on the scope of the EIA assessment and the time table
- EIA Report
- Comment procedure and public hearing
- Development of the expert review
- Final statement of MoE

Current situation of EIA process – **Commenting of EIA Report**

EXPECTED MILESTONES IN THE SCHEDULE OF THE EIA PROCESS

BASIC ASSUMPTIONS FOR NEW NUCLEAR POWER PLANT

- **Existing design, licensed in the country of the origin, in some country of European Union or in other nuclear developed country (USA, Russia, Japan, South Korea, etc.),** in the time of supplier selection at least in the advanced stage of the construction on another site.
- **Turnkey supply** or supply of technological islands with coordination function from the supplier.
- **Supply of the technology together with nuclear fuel supply**, taking into the account the possibility of the diversification of nuclear fuel supplier.
- **Securing of the licensing process in compliance with legislative procedures of the Slovak Republic** and with the utilization of experiences and recommendations of the international institutions.

SAFETY CHARACTERISTICS OF PWR REACTORS GEN III+

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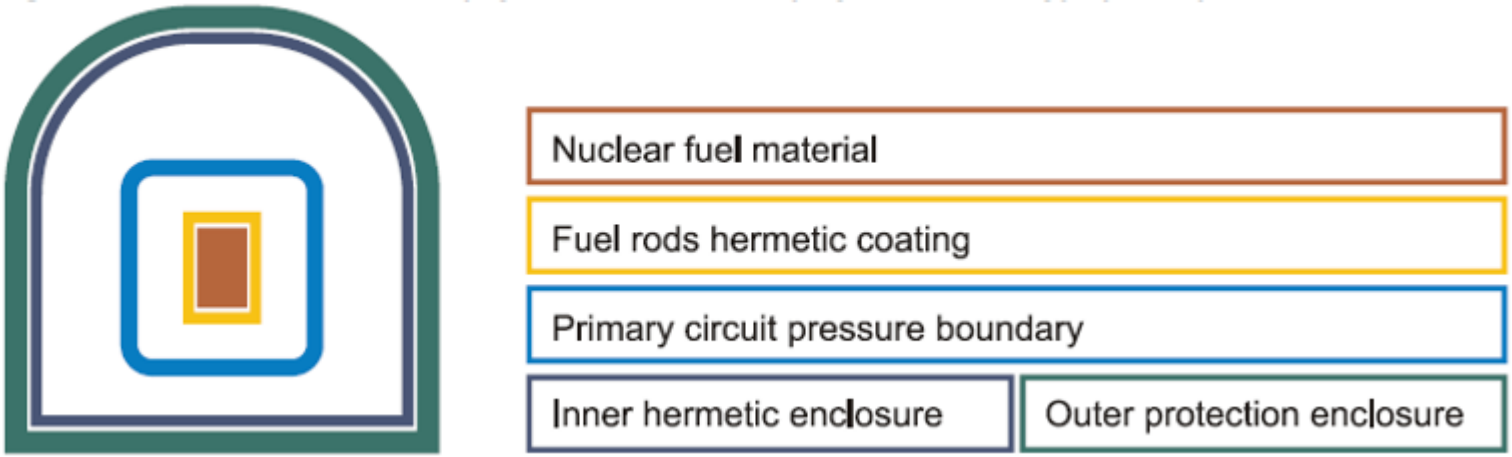
Basic safety advanteges of PWR reactors over other types:

- **Stability of the reactor as a result of the existence of a negative power feedback**
  Increasing reactor power, fuel and coolant temperature counteracts a further increase in power.

- **Equipped with passive system of emergency reactor shut-down.**
  The control rods are held in the upper position by electromagnets and in case of need, they are inserted to the reactor's core by means of their own weight. After their insertion, the nuclear reaction is stopped safely.

- **Primary and secondary circuit separation.**
  The secondary circuit is separated from the primary circuit by the steam generator, hence the water in the secondary circuit practically does not involve radioactive substances, which restricts the leakage of radionuclides to the environment.

PHYSICAL BARRIERS



- **The purpose of these physical barriers** is to impede the penetration of radioactive substances from the place of emergence (nuclear fuel material) gradually up into the external environment.
- **Each physical barrier is designed conservatively** (with substantial project reserves in relation to damage) and its state is monitored during operation.

SAFETY CHARACTERISTICS OF PWR REACTORS GEN III+

Specific safety characteristics of reactors generation III and III+ for severe accident management::

- **The containment integrity is designed for severe accidents conditions.**
- **Higher required containment integrity** – maximum allowed leak during the accidents (including severe) 0,5% of volume / 24 hours.
- **Improvement of the system for hydrogen elimination within containment**- hydrogen recombiners and hydrogen igniters.
- **Containment passive cooling system** – complete supply of coolant is entirely in the containment.
- **The system for cooling of the core melt outside of reactor vessel** (core melt catcher with passive cooling) - complete supply of coolant is entirely in the containment.
- **The use of passive system for cooling of containment wall by the air.**
- **Larger supply of cooling water** for emergency cooling contained on the NNPP site.

SAFETY CHARACTERISTICS OF PWR REACTORS GEN III+

Basic safety characteristics of the reactors of the generation III and III+, in comparison to the previous generations:

- **Lower occurrence probability of accidental and emergency conditions/situations** (including severe accidents).
- **Equipped with the means for managing severe accidents** as a part of design solution.
- **Station Blackout is managed and addressed in design** (the loss of all power supply sources).
- **Use of passive elements for safety systems;** use of basic natural physical principles and thus reducing the dependency on the power supply and other support systems.
- **Higher redundancy** (backup) of the safety systems.
- **Can cope with severe accidents,** including catching and cooling of potentially formed reactor core melt.
- **Can cope with more severe external events** (e.g. aircraft crash, earthquake) – higher resistance of the containment and primary circuit components.
- **Prolonged period** during which the operators' intervention is not required in case of the accidents.

EIA REPORT

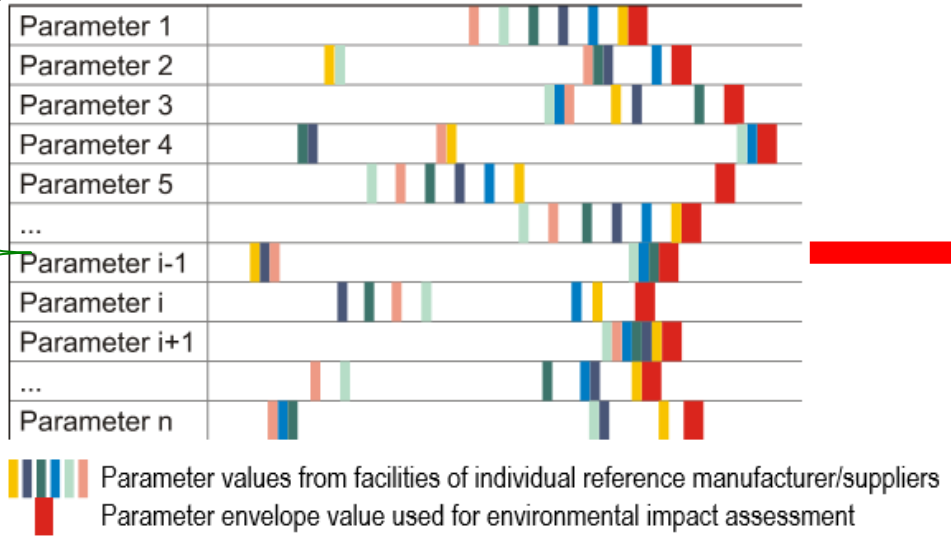
EIA Report in compliance with Act No. 24/2006 Coll.,
on the Environmental Impact Assessment.

Focus on safety of the assessment - a conservative approach

Parameter envelope

Reference suppliers:

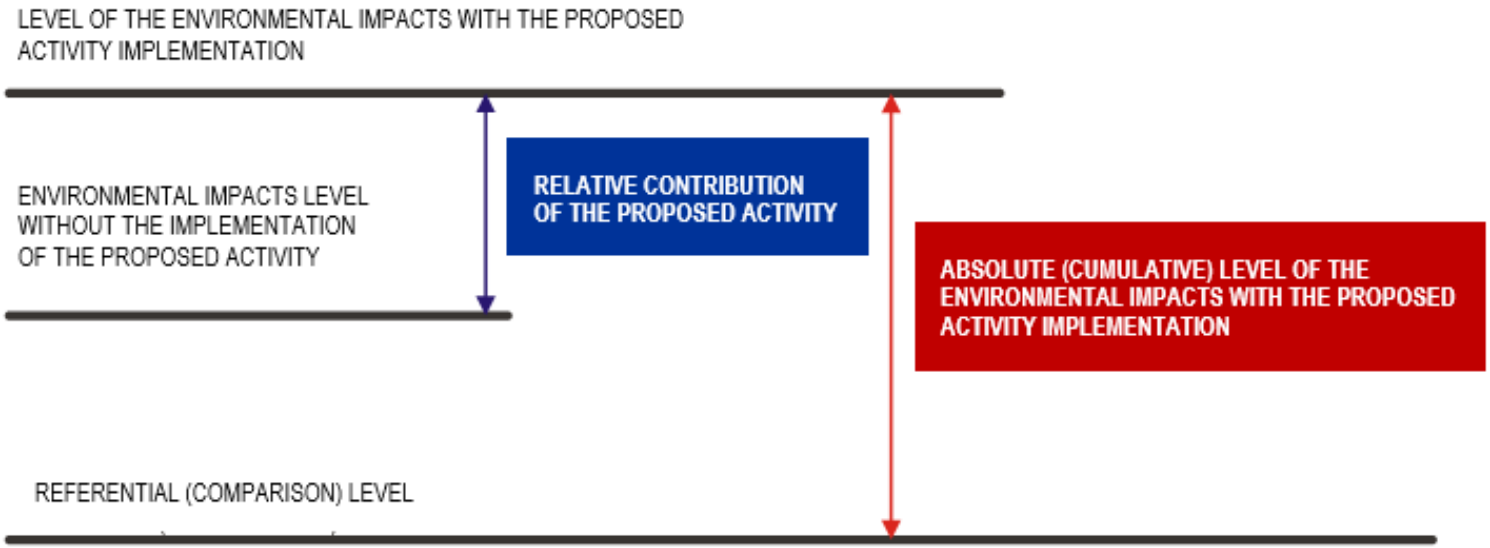
AP1000
EU-APWR
MIR 1200
EPR
ATMEA1
APR1400



PARAMETER ENVELOPE FOR EIA

EIA REPORT

Cumulative effect



All areas of the environment

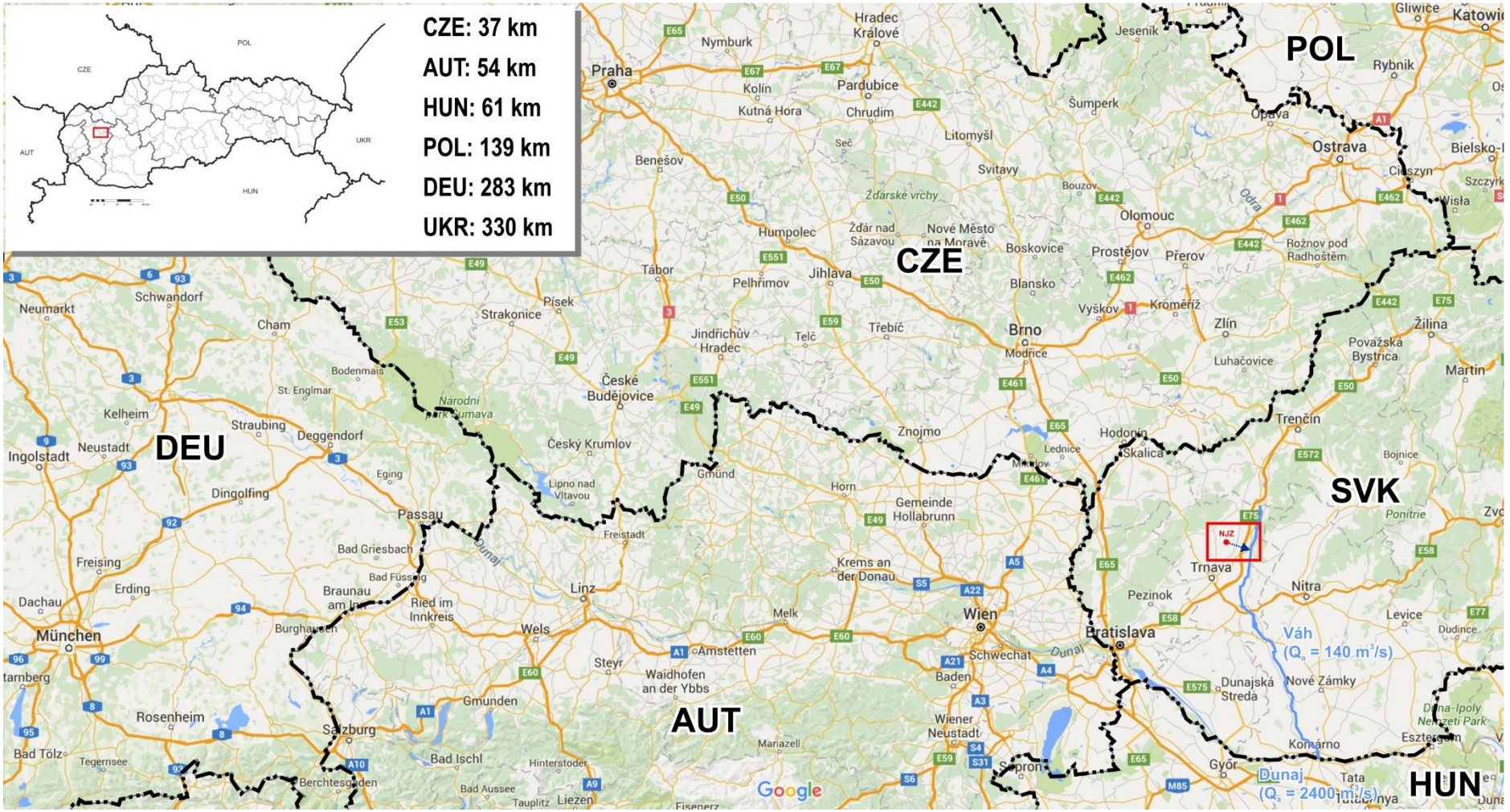
All phases of the life cycle

All potential accidents

The assessment of transboundary impacts

Does Not Include: safety documentation, political and economical decisions

CROSS-BOUNDARY LAYOUT



TRANSBOUNDARY IMPACTS, NORMAL OPERATION

Non-radiation impacts:

- insignificant

Radiation impact (cumulative impact from all facilities at the site):

natural radiation background: cca 3000 µSv/year

TRANSBOUNDARY IMPACTS, ACCIDENTS

Design accident:

- ≥ 800 m from reactor: < 10 mSv/year (no immediate protection measures including the sheltering, iodine prophylaxis and the evacuation, possible time-limited consumption regulation of the food, water and feed),
- ≥ 40 km from reactor: < 1 mSv/year (equals to limiting value for normal and abnormal operation conditions in accordance with the directive of the Council 2013/59/Euroatom, or ICRP publication 103) for the most common weather conditions.

Severe accident:

- ≥ 1000 m from reactor: < 10 mSv/48 hour (sheltering), < 50 mSv/7 days (evacuation), < 100 mSv for lifelong dose on thyroid gland (iodine prophylaxis) – no need for protection measures in the distance ≥ 1 km from the reactor, the limitation of the consumption of locally grown food and water from local sources can be expected.
- ≥ 40 km from reactor: < 1 mSv/rok (equals the limiting value for normal and abnormal operation conditions in accordance with the directive of the Council 2013/59/Euroatom, or ICRP publication 103) for real weather conditions.

CONCLUSION

- **No factors were identified that would prove exceedance of limits set by valid regulations or requirements, or that would prove unacceptable significant impact on the environment and human health, including cross-border impacts on neighboring states.**
- **This conclusion takes into account the cumulative impact of the existing activities at the site and the current environmental background of the site.**
- **The expected impacts are acceptable in all environmental aspects.**
- **Environmental risks are acceptable in the vicinity of NNPP as well as on a cross-border scale.**

JESS Jadrová energetická spoločnosť Slovenska

amec foster wheeler

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THANK YOU

FOR YOUR ATTENTION