

# BELENE NPP

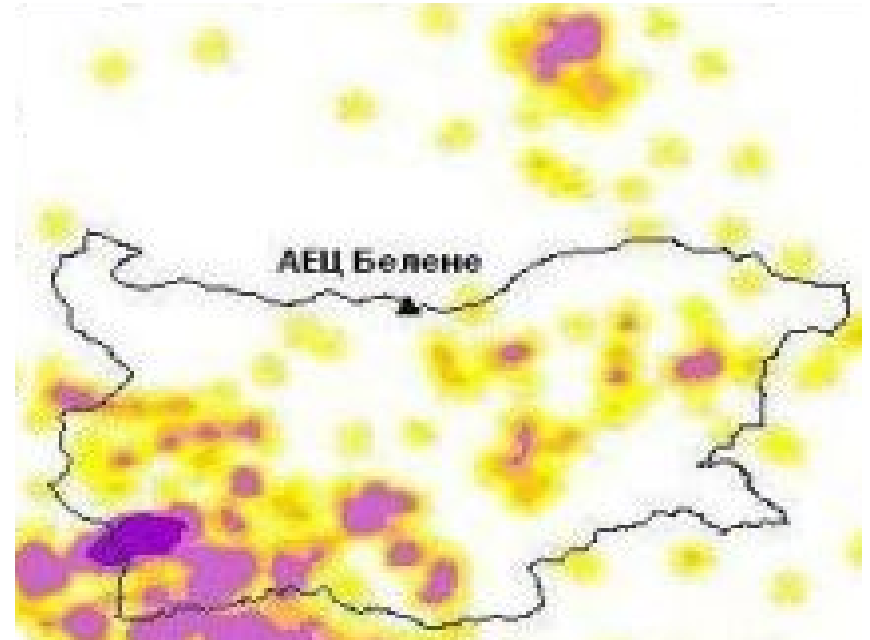
Belene site is situated in Northern Bulgaria on the Danube River.

1987: Technical design for construction of four reactors of VVER-1000 type

1987 – 1990: Construction activities

1991: the project is stopped  
protest of citizens, academy of science,  
lack of finances.

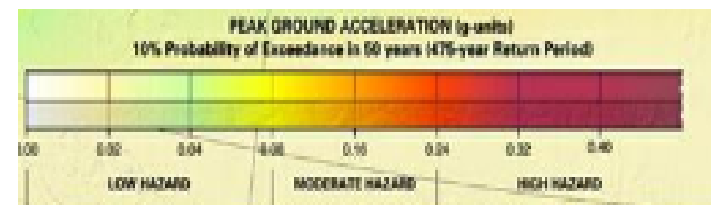
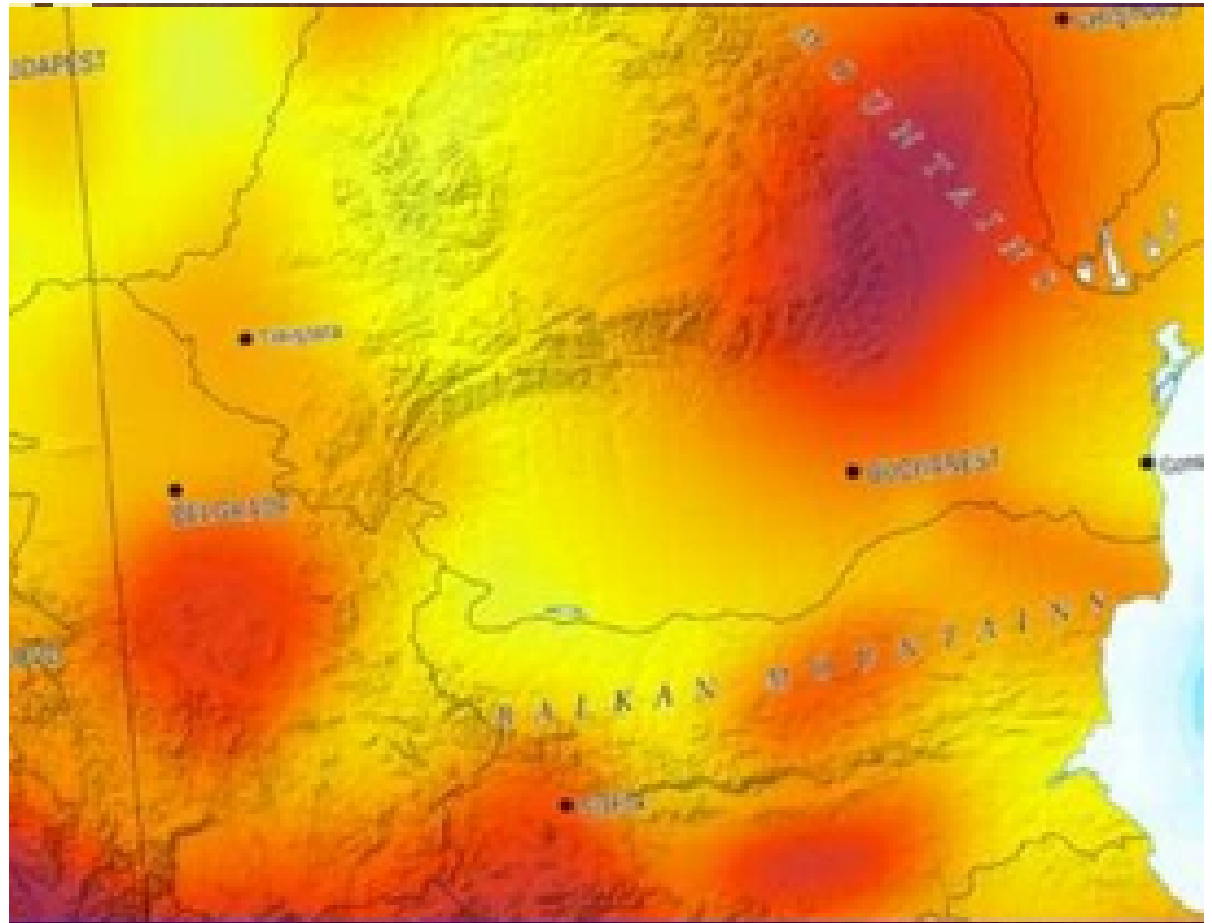
2006 decision for a new NPP construction in Belene:  
VVER 1000 - one of several new “customized” layouts.

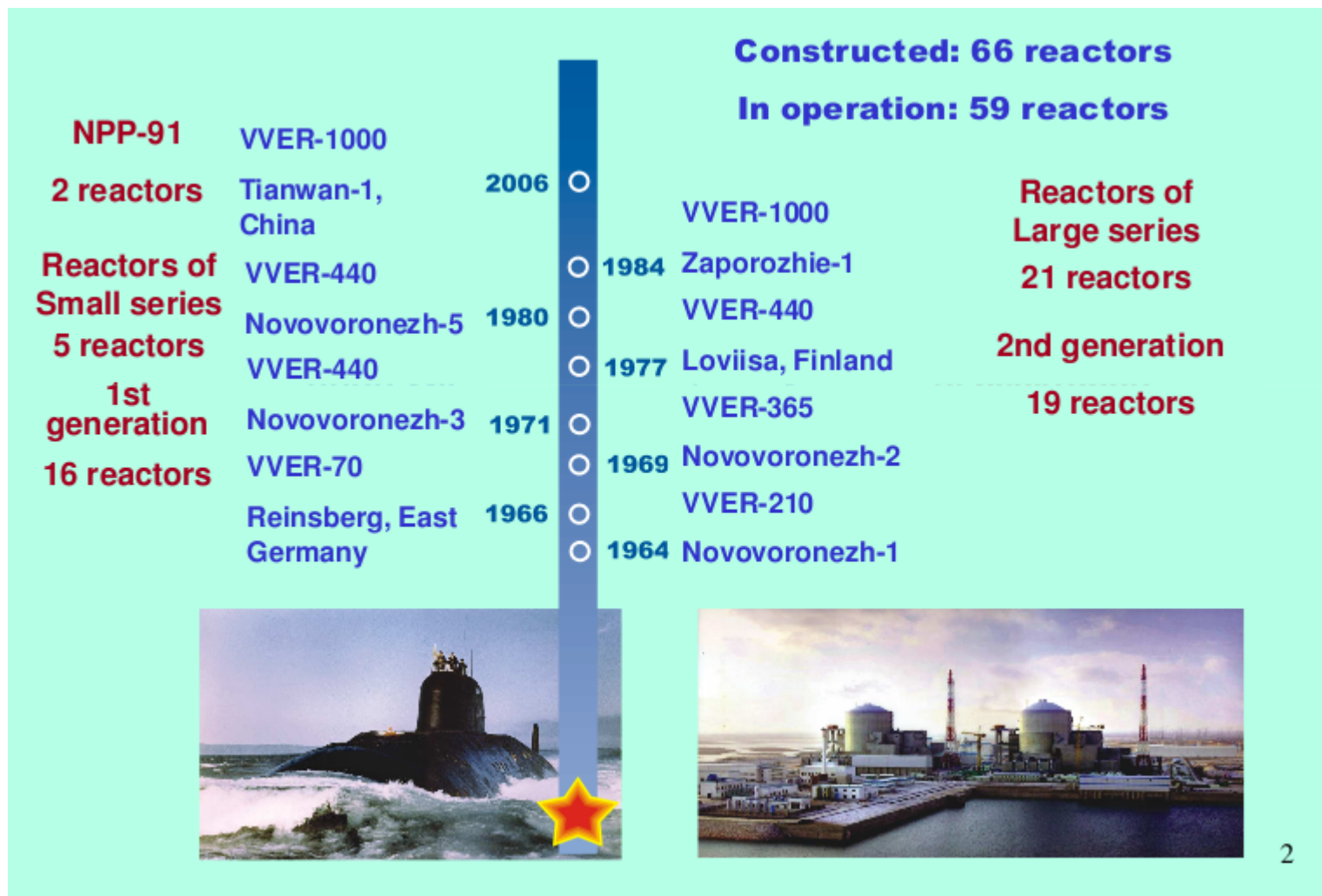


# Earthquake risk

Belene site has medium to high seismic hazard.

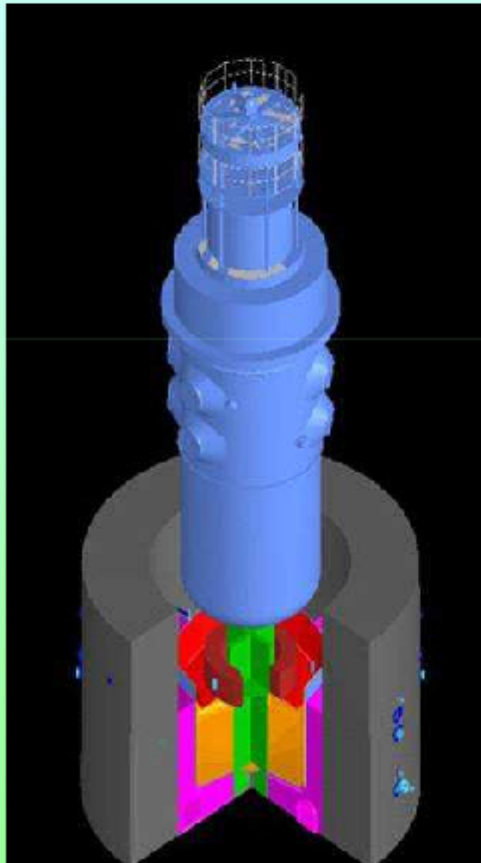
Earthquake risk was an important argument to warn off banks and utilities (RWE)





Some more of these reactors: Buser, Kundakulam, Leningrad 2 and Novovoronezh 2.  
 ?

## **Core melt retention system (core catcher)**



- Location under the reactor lower head
- Protection from thermal & mechanical impacts of the corium
- Provision for heat removal from the corium
- Provision for the corium subcriticality
- Reduction of gas release into the containment
- Provision for exothermal reactions

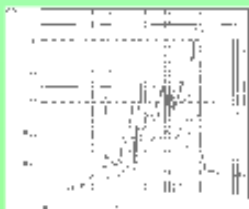
# Protection from external impacts in the NPP-2006 design



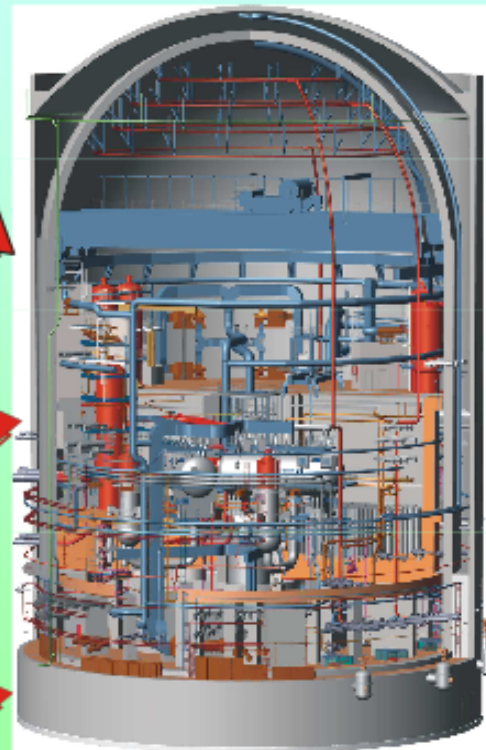
Aircraft crash



Snow loads  
4.3 kPa



Earthquakes  
0.25 g



Hurricanes,  
Storms,  
Tornadoes



External explosions  
30 kPa, 1 s



Floods

# VVER 1000/V392, AES 2006, MIR

- El. power is gradually increased 1000 to 1200 MW (V392M, V491)
- More passive safety features
- Core catcher
- first licensed in China
- AES 2006 with VVER 1000 (Belene) has got an EUR certificate !
- STUK (Finland) criticised resistance against external hazards, deficiencies in separation of redundant safety systems

Thank you for your attention!



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