



Silesian  
University  
of Technology



# THE IMPACT OF ACCIDENTS IN CHERNOBYL AND FUKUSHIMA ON NUCLEAR ENERGY IN THE WORLD

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# Outline of the presentation

1 Introduction

2 Aim and scope of work

3 Chernobyl impact on nuclear energy

4 Fukushima impact on nuclear energy

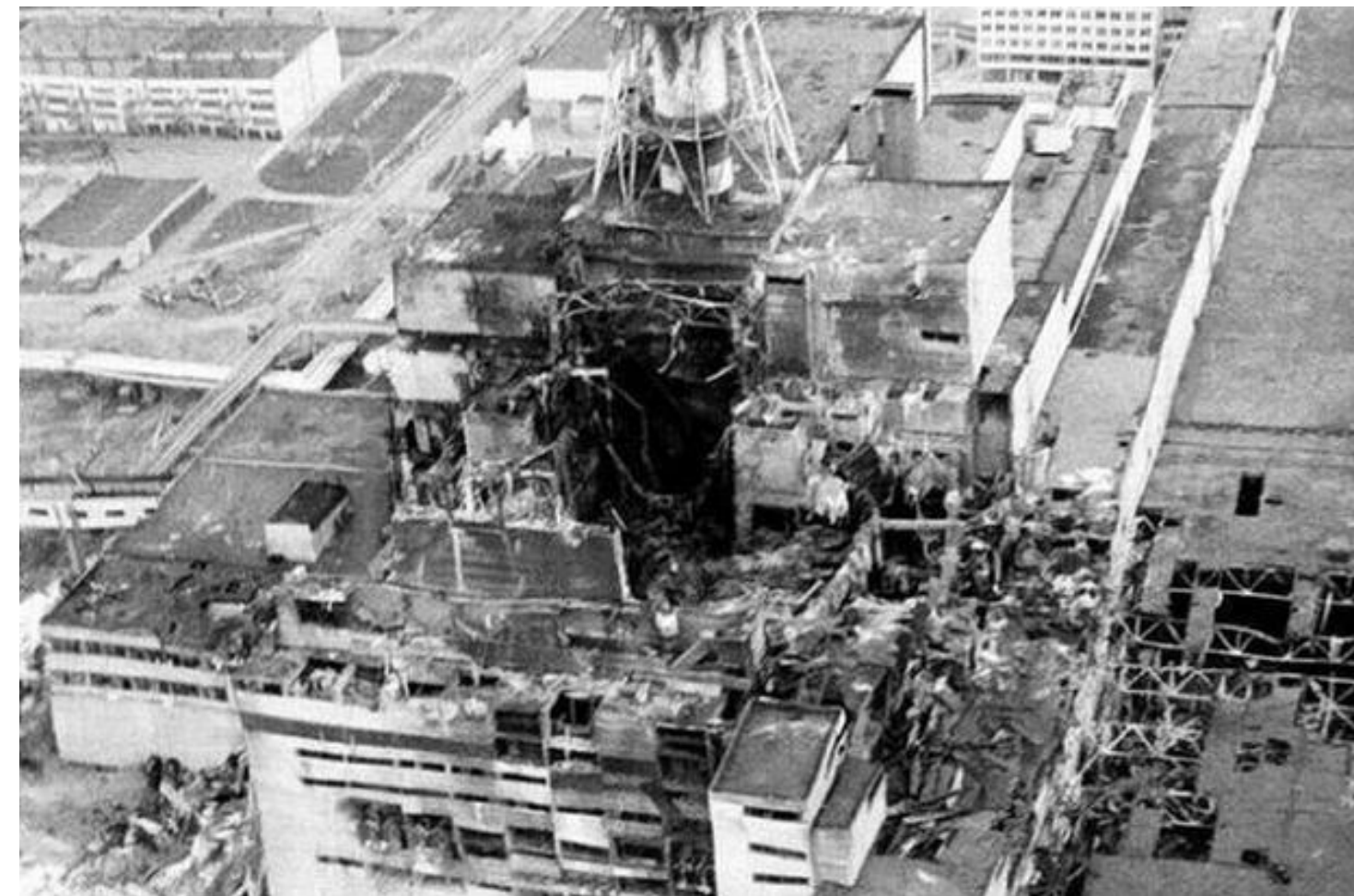
5 Conclusions

# 1. Introduction

Chernobyl accident: 26.04.1986



Experiment



Fukushima accident: 11.03.2011



## 2. Aim and scope of work

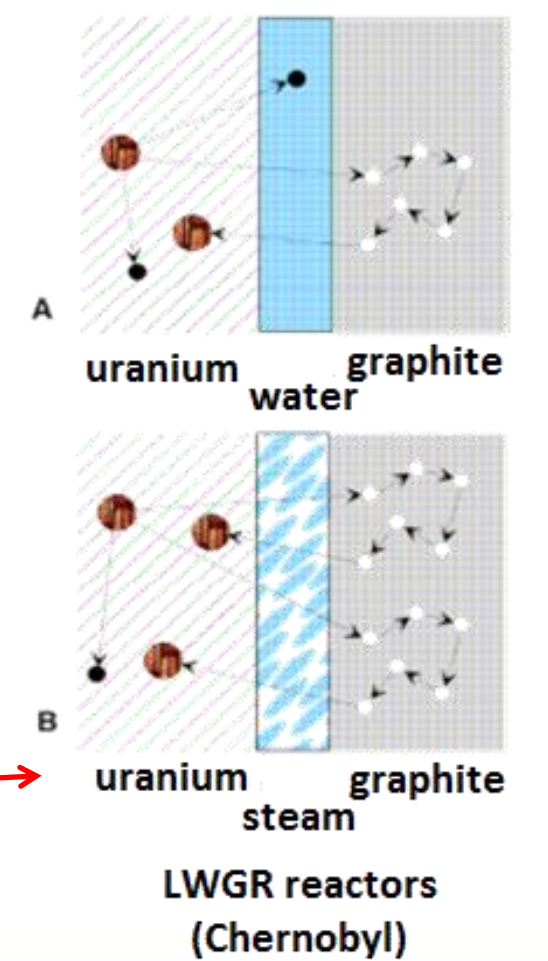
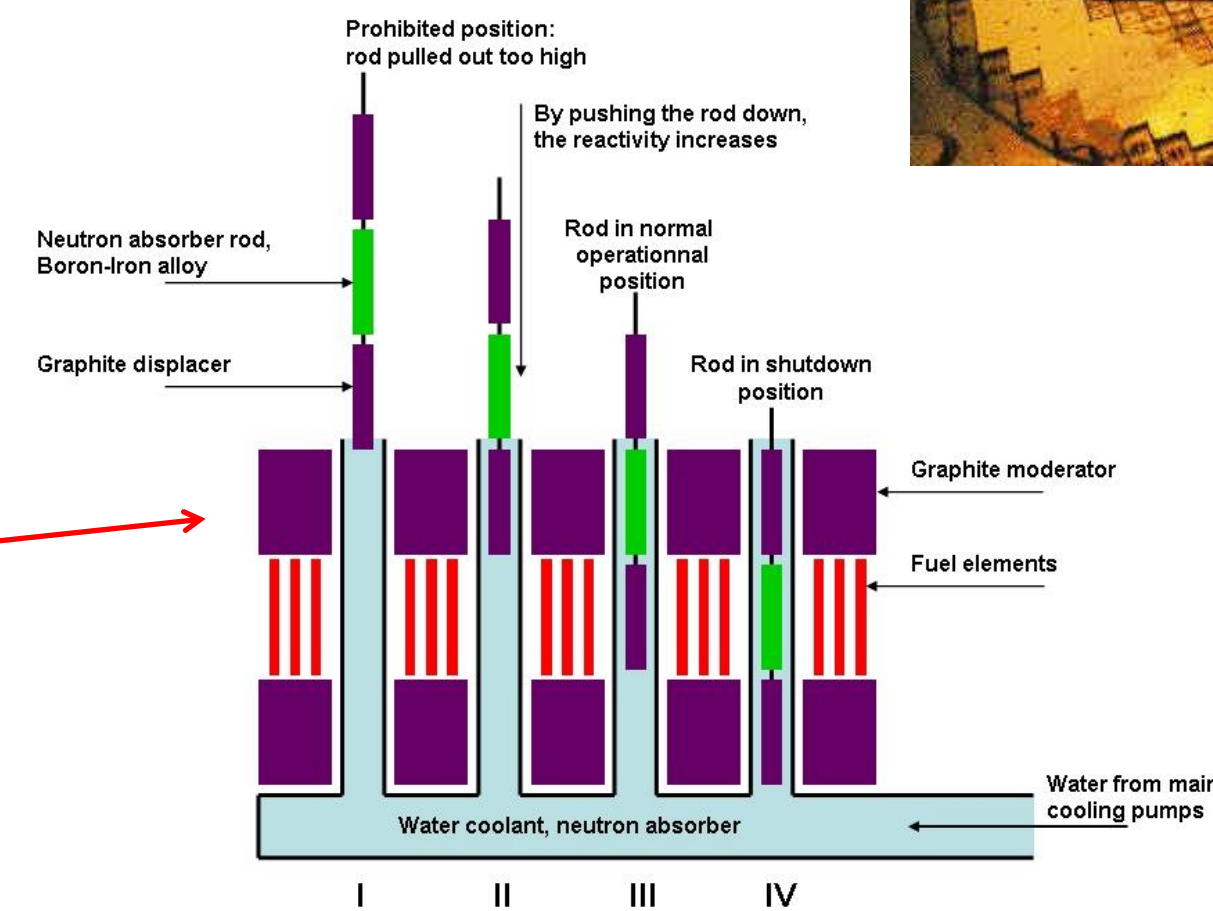
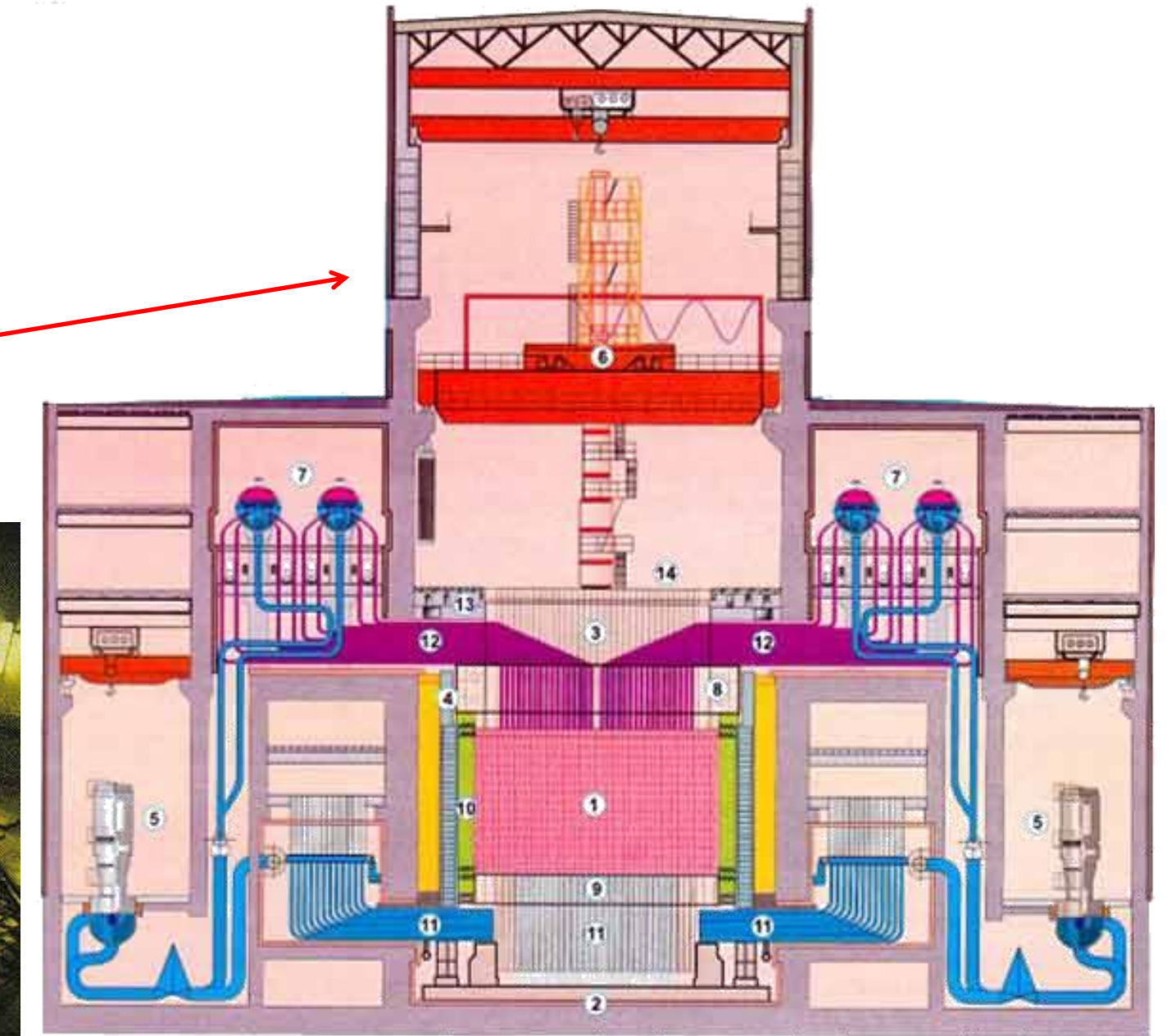
Have we learnt anything after those events ?

- Technical modifications to nuclear reactors/nuclear power plants
- Procedural modifications
- Nuclear energy sector impact
- Public acceptance of nuclear energy

# 3. Chernobyl impact on nuclear energy

RBMK (LWGR) reactor features

- no full-pressure containment
- very big core
- overmoderation
- positive void reactivity coefficient



# 3. Chernobyl impact on nuclear energy

Technical aspects:

- overmoderation (application of slightly enriched nuclear fuel)
- positive void reactivity coefficient
- changes to the control room

Procedural modifications:

No experiments allowed in power reactor systems. Extensive operators training program. Procedures checked for all reactors around the world.

# 4. Fukushima impact on nuclear energy

Technical aspects:

- Importance of passive safety systems raised (global trend in design processes)
- Additional power supply sources (mobile generators)
- Access points for connection of external power and water supply
- Anti-flooding systems

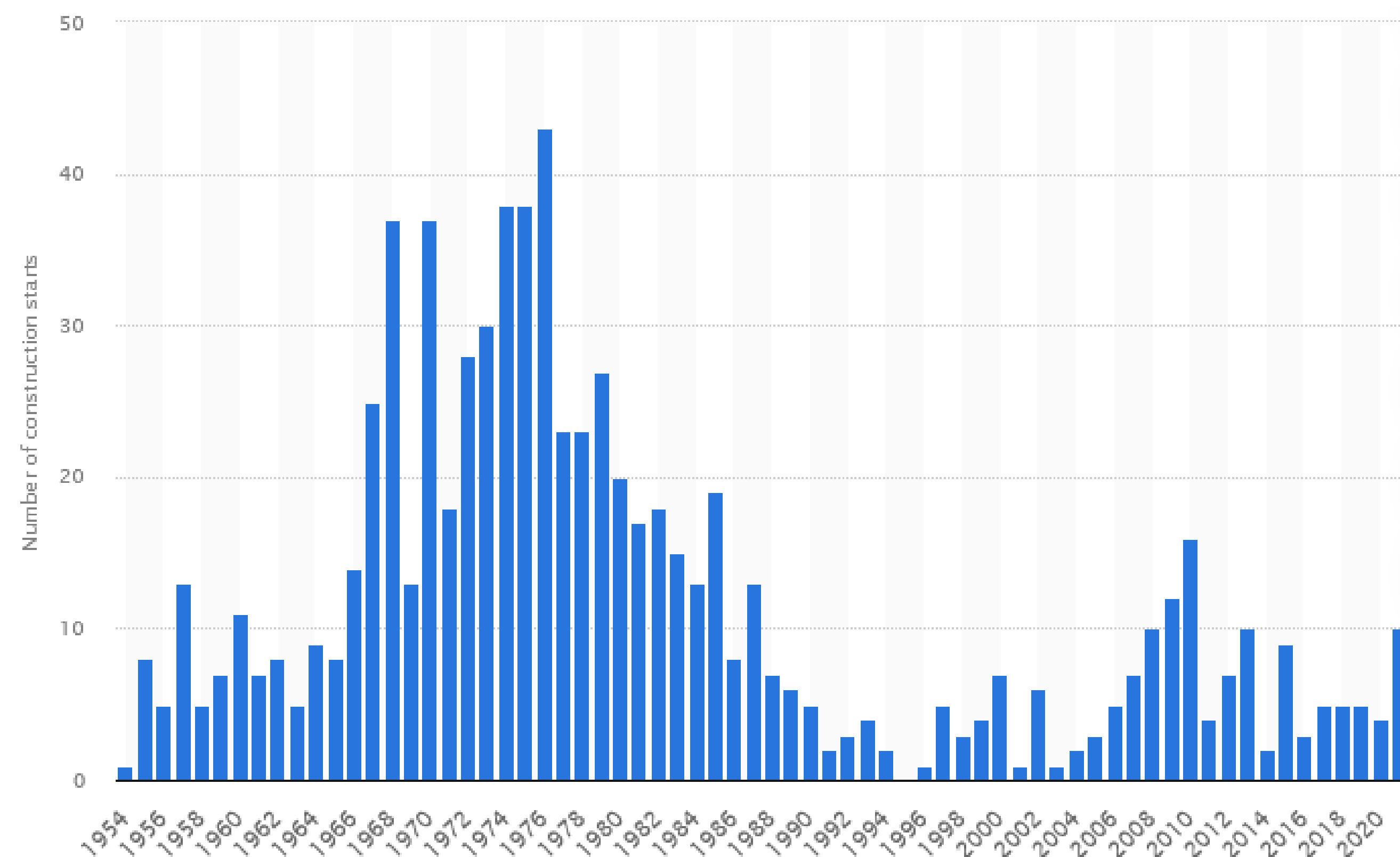
**Stress tests**

Procedural modifications:

Procedures checked and modernized for all reactors around the world. Extensive operators training program. Offsite fast reaction forces.

# 3/4. Chernobyl/Fukushima impact on nuclear energy

The impact on nuclear energy sector (1)

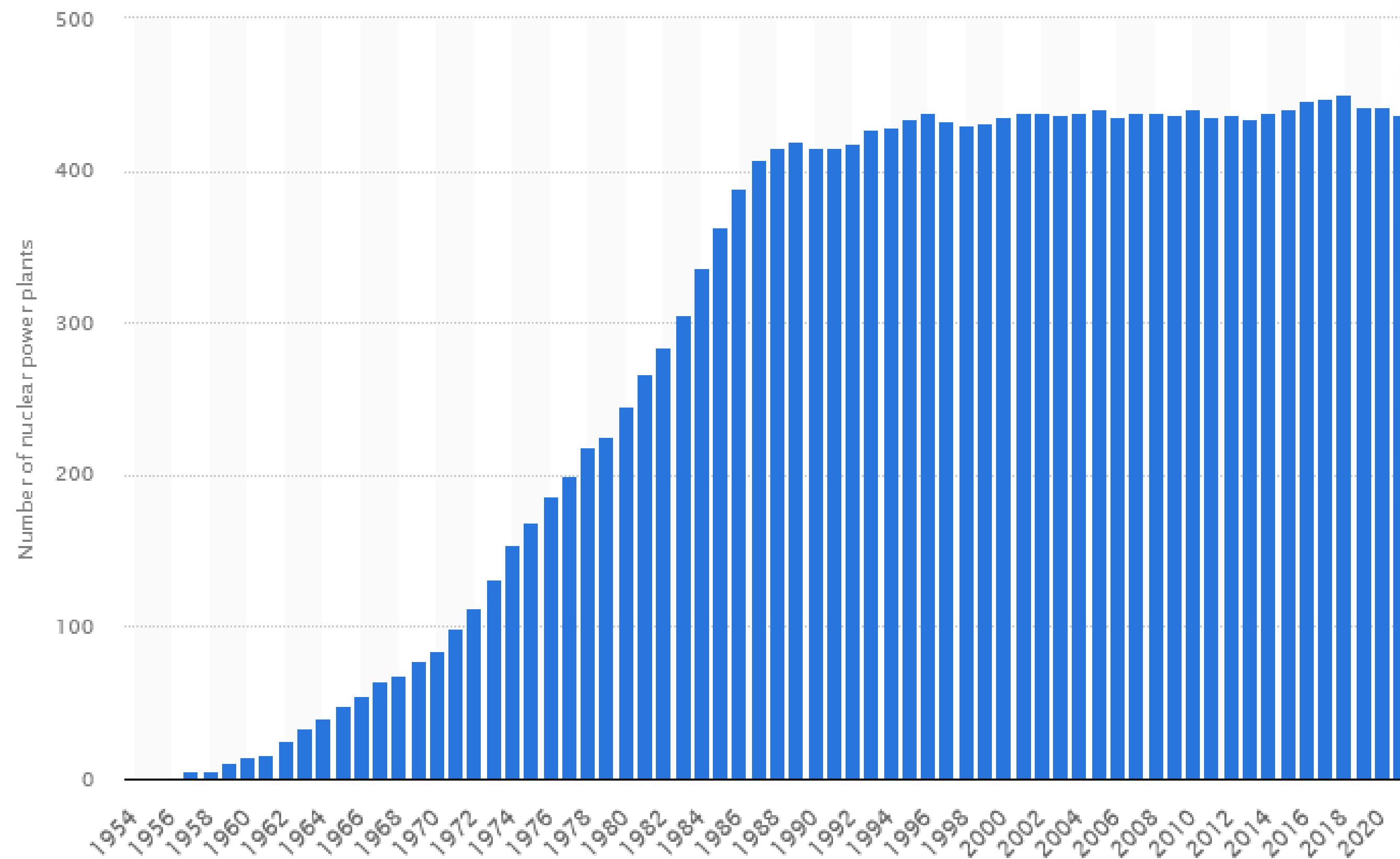


Sources: PRIS, WEO, World Nuclear Energy Status Report, BP Statistical Review



# 3/4. Chernobyl/Fukushima impact on nuclear energy

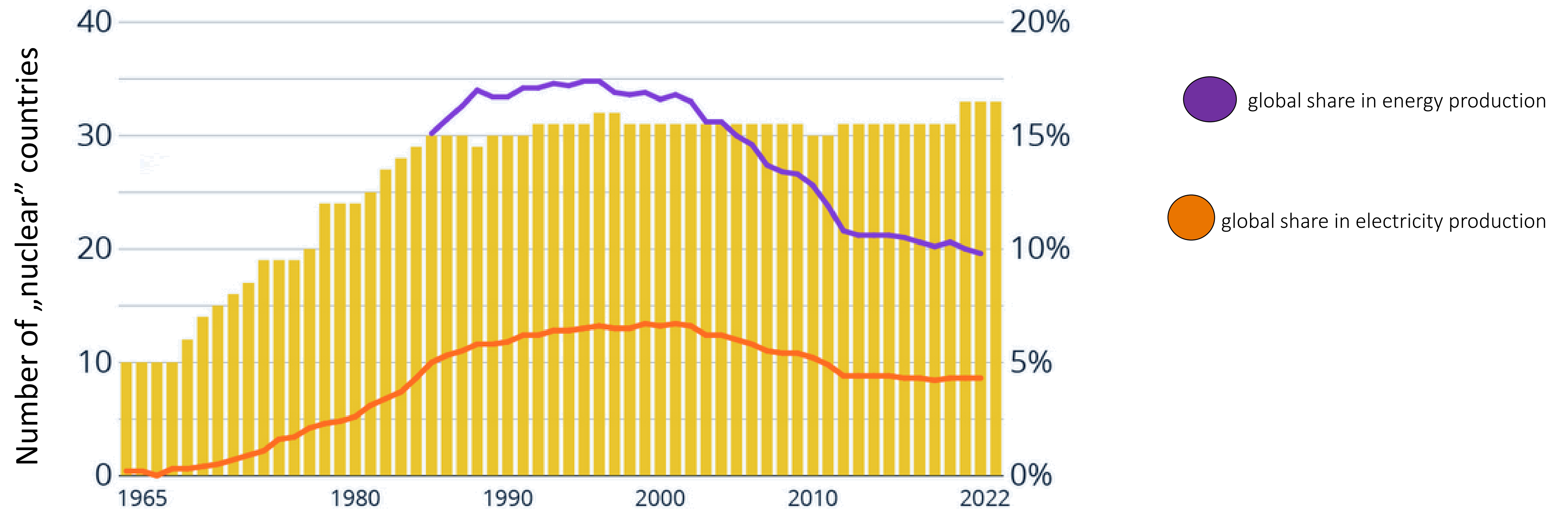
The impact on nuclear energy sector (2)



Sources: PRIS, WEO, World Nuclear Energy Status Report, BP Statistical Review

# 3/4. Chernobyl/Fukushima impact on nuclear energy

The impact on nuclear energy sector (3)



Sources: PRIS, WEO, World Nuclear Energy Status Report, BP Statistical Review

# 5. Conclusions

Have we learnt anything after those events ?

YES

Both, Chernobyl and Fukushima accidents emphasized the importance of safety culture: even though contemporary nuclear reactor technologies become inherently safer, a human factor will always have an impact on nuclear safety.

# THANK YOU FOR YOUR ATTENTION



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