

sky news



# CHERNOBYL: THE MEN WHO WITNESSED DISASTER



Chernobyl: The men who witnessed the disaster  
Yesterday  
I first thought it was war, a direct hit with a

00:02

03:28



# Chernobyl, the salad, and the test

A story about pressure, drift, and the discipline to stop.

# The garden in Hungary

Hungary. April 1986. I was ten years old.





# Something far away had reached us

A radioactive cloud had drifted across Europe.

No official explanation. No mention of Chernobyl.

Just one quiet instruction: avoid fresh produce.

**You do not need to be inside the plant for the plant to reach you.**

# Chernobyl did not begin with an explosion

It began with a promise.

The promise that nuclear power was the future made real. Not only electricity — proof of modern life, scale, and progress.

When the symbol matters too much, it becomes harder to stop.



# The system behind the promise

## **Deadlines became political facts**

Engineering estimates gave way to political commitments.

## **Problems were absorbed, not always solved**

The system learned to proceed with what it had.

## **Exceptions became normal**

Drift rarely feels dramatic while it is happening.

Nuclear power was meant to symbolise the future, discipline, and control.

# Secrecy, confidence, and trapped learning

→ Accidents stayed  
secret



Warnings travelled  
badly

→ Confidence replaced  
doubt



The worst was  
assumed to belong  
elsewhere

"Believing 'it cannot happen here' makes warning signs easier to miss."

# The RBMK reactor

## How it worked

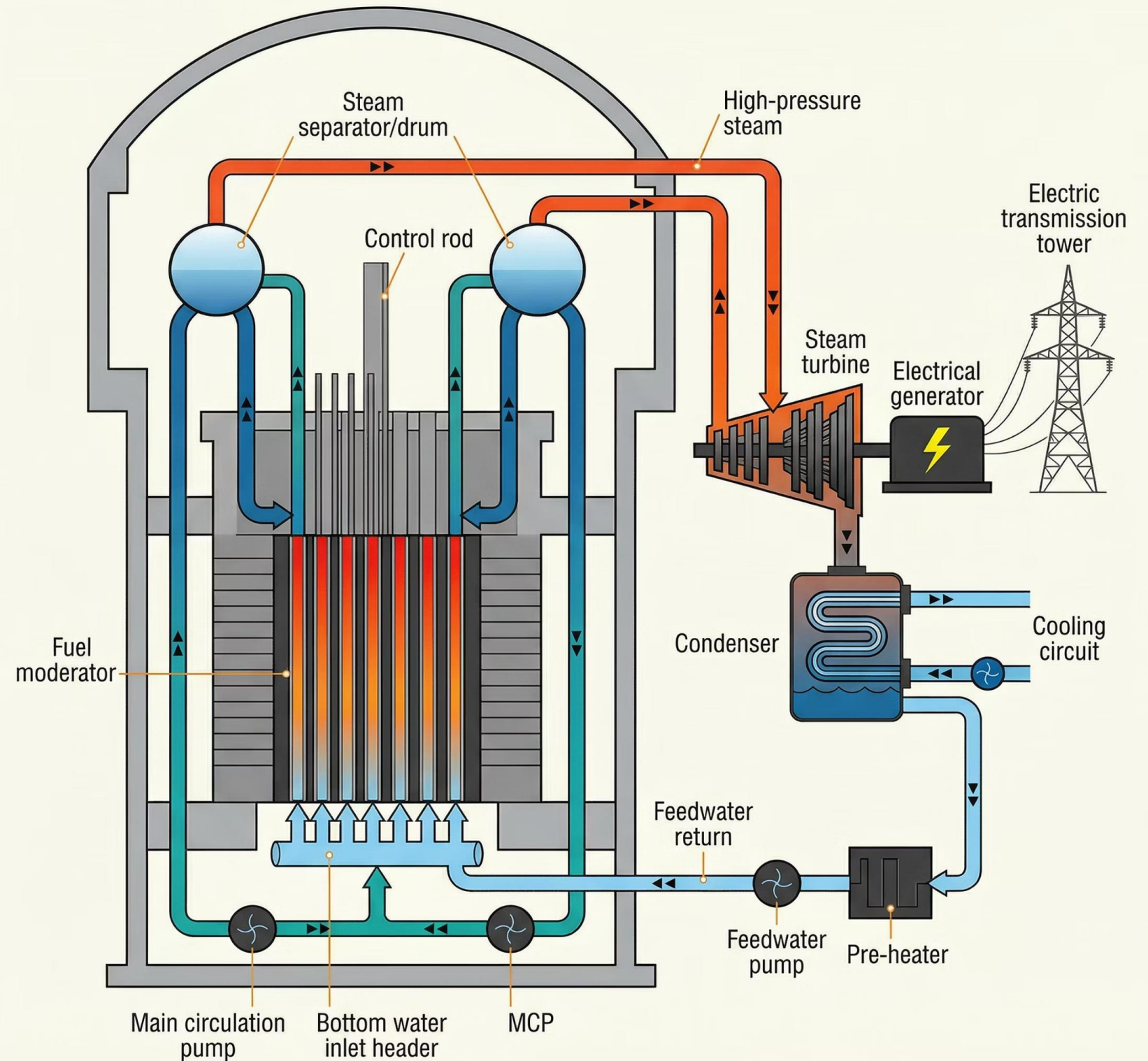
Graphite moderated the core. Water flowed through separate pressure tubes, cooled the fuel, and boiled directly to steam for the turbines.

## Why it was attractive

High electrical output, online refuelling, and channel-type construction that avoided a single huge pressure vessel.

## Why it was vulnerable

The direct boiling cycle linked steam formation directly to neutron behaviour. The core was enormous, and the design lacked a robust full containment structure.



# The reactor had hidden edges

## Low-power instability

At low power, the RBMK became difficult to control.

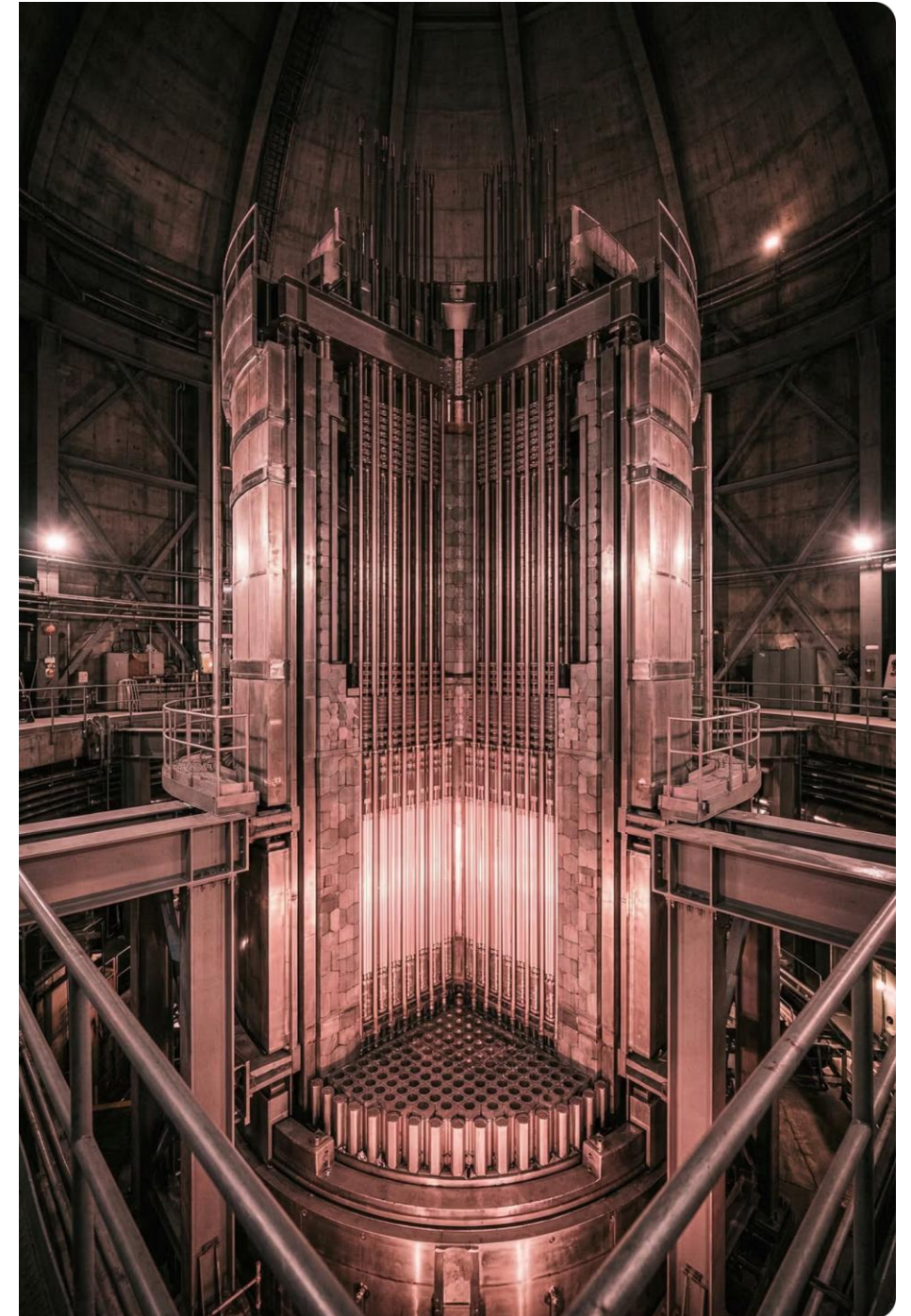
## Positive void coefficient

As water turned to steam, the graphite still moderated while the water absorbed fewer neutrons. Reactivity could rise instead of fall.

## Limited visibility in the core

The core was so large that operators could not fully see changing conditions everywhere inside it, especially at low power.

- ❏ The RBMK's positive void coefficient was known to Soviet physicists before Chernobyl. The full extent of the risk was not disclosed to plant operators.



# AZ-5: the safety action everyone trusted



## 1 The last line of defence

Trusted completely. Used without hesitation.

## 2 Not instantaneous

A fast power transient could outrun full rod insertion.

## 3 Graphite displacer tip effect

The first phase of rod insertion could briefly increase reactivity in the lower core.

The action meant to stop the event could, in the wrong conditions, help drive it forward.

# The calm outside, the culture inside



## Outside: Pripyat

- Atom city. Nearly 50,000 people.
- Young, modern, confident.
- An ordinary evening.

## Inside: the plant

- Young, ambitious workforce.
- Hierarchy mattered greatly.
- Experience was uneven.
- People learned the culture as much as the procedure.

Operations are shaped by social learning as much as by written rules.

# The test sounds reasonable

📄 Fourth attempt in four years. 1982, 1984, 1985 — all failed.

## The safety question

if offsite power failed, the pumps still needed electricity.

## The test's purpose

Could the coasting turbine bridge the gap?

The question was not irrational. By then, the conditions were no longer the right ones.



# The people in the control room

## **Dyatlov**

Senior manager. Driving the test to completion.

## **Akimov**

Shift supervisor. Responsible for the unit that night.

## **Toptunov**

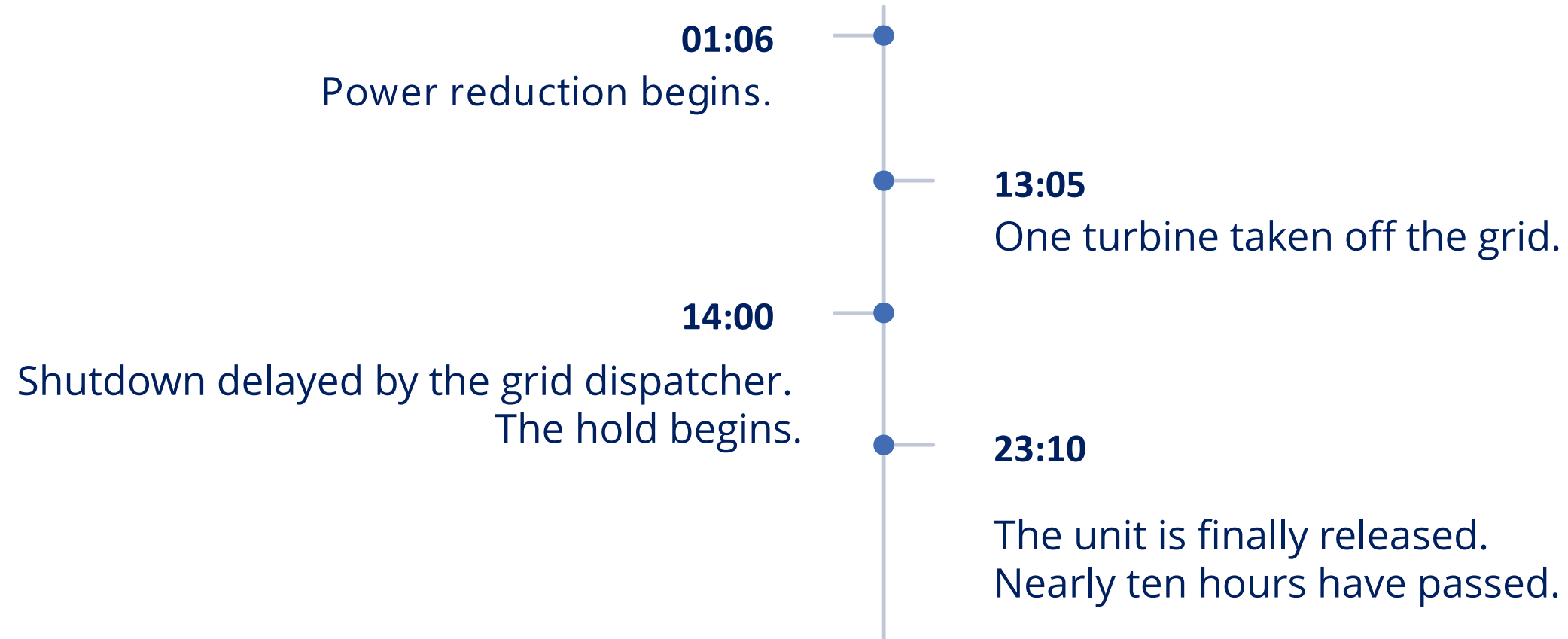
Reactor control engineer. Young. Relatively new in the role.

## **Metlenko & the electricians**

There to run the test. Under pressure not to leave without completing it.

**Everyone in that room believed they were managing a test.**

# The plan breaks



## **Fatigue grows**

Shift patterns change.  
People wait.

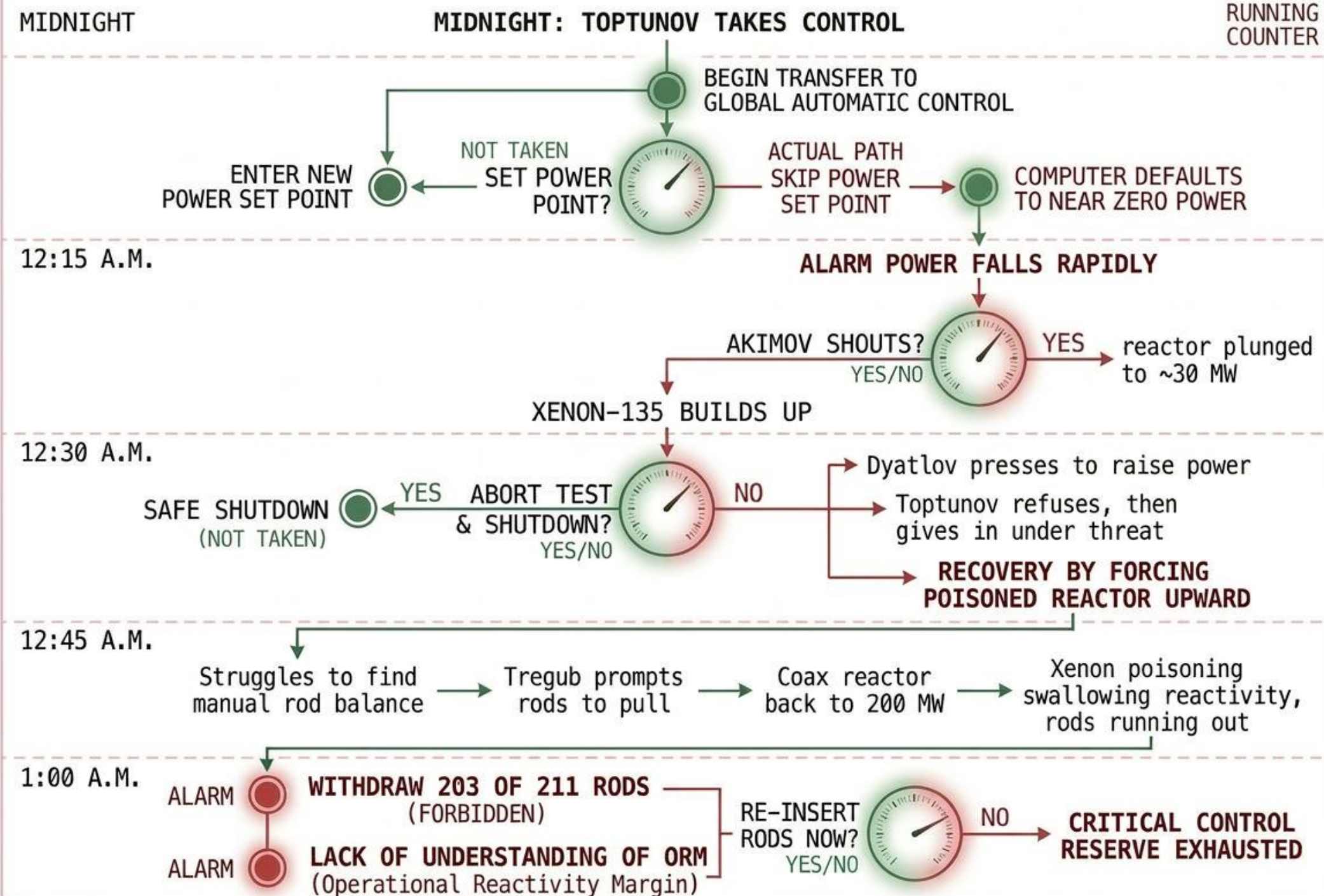
## **Impatience builds**

The desire to complete the  
task becomes stronger.

## **Procedure becomes endurance**

The original rhythm of the  
plan is lost.

# FALSE RECOVERY – REAL DANGER



# False recovery, real danger

## ~200 MW

Recovered. But **Operational Reactivity Margin** had fallen to 6–8 rods. Minimum required: 15.

## All 8 pumps running

Pushing the hydraulic limits of the system.

## Coolant near boiling

Almost no thermal buffer. The core was highly sensitive to any change.



Operating below minimum ORM was a direct violation of the operating regulations. Dyatlov was aware of this. The test continued anyway.

**"The reactor was now on a knife-edge."**

**The system looked stable on the surface. It had become more fragile.**

# 01:23:40 — AZ-5

*Shut down the reactor!* - Akimov waved his hand in the air: *AZ-5!*

This should have been the saving moment. Instead, AZ-5 arrives at the worst possible time, in the worst possible conditions. The initial phase of rod insertion adds reactivity in the lower region of the core. The final safety action becomes part of the final escalation.

The warning lamps flashed red, electric buzzers squawked angrily. Toptunov shouted out a warning: *Power surge!*

*Shut down the reactor!* - Akimov yelled..

# Return to the garden

When I was ten, my mum stopping me felt like a strange overreaction..

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## Three questions

1

**Are we still in the right conditions?**

Is this work still designed for where we are now?

2

**Have we used up margin?**

Have we consumed safety margin just to keep going?

3

**Are we normalising exceptions?**

Are we treating a deviation as if it is normal?



# Thank You

## Questions & Discussion

### Stay in touch

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