CONTROL CENTRAL NUCLEAR

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Nuclear Safety Monitoring: An Overview

This presentation explores the critical parameters of nuclear safety monitoring. We will highlight the vital role of a comprehensive webpage in ensuring operational security. Our focus is on preventing dangerous situations through continuous vigilance and advanced control.

Pressure and Temperature: Reactor Stability

Key Metrics

Reactor pressure is maintained within safe ranges, typically 15-16 MPa. Coolant temperature is controlled below 315°C to ensure stability. Real-time graphs show current status and historical trends.

Automated alarms trigger if deviations exceed safe limits, such as ±5% from optimal. This proactive approach helps maintain reactor integrity and prevents critical incidents.

Radiation and Neutron Flux: Fission Control

Radiation Levels

Gamma and neutron radiation levels are kept below 0.1 mSv/h. These strict limits protect personnel and the environment.

Neutron Flux

Neutron flux, indicating the chain reaction, is monitored at 10^13 $n/cm^2/s$. Peaks trigger immediate alarms.

Emergency Protocols

Unexpected doubling in one minute activates emergency protocols. This ensures rapid response to anomalies.

Continuous monitoring of radiation and neutron flux is essential. It provides early warnings for potential issues in fission control. Swift action is critical to maintaining safety.

Water Levels and Gas Concentration: Cooling and Containment

Water Levels

Reactor water levels and spent fuel pool levels are meticulously monitored. Critical levels prevent overheating.

Gas Concentration

Xenon and Krypton concentrations within containment are continuously checked. Levels below 100 ppm are crucial.

Control Systems

Sprinkler and ventilation systems are controlled via the webpage. Automated responses manage gas levels.

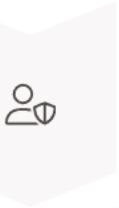
Maintaining optimal water levels ensures adequate cooling. Monitoring gas concentrations prevents hazardous buildups. Integrated systems facilitate quick and effective responses.

Production and Operation Time: Efficiency and Safety

Energy Production	Measured in MW (thermal and electrical)	Ensures stable output within design limits
Operation Time	Tracks reactor runtime for maintenance	Triggers alarms for material stress (e.g., >100,000 hours)

Analyzing production rates against operation time balances efficiency and safety. Scheduled maintenance prevents component failure. Alarms for extended operation protect material integrity.

Personal Exposure and Individual Alarms: Worker Protection



Dose Monitoring

Radiation dose received by each worker is continuously tracked. This ensures compliance with safety regulations.

Personal Alarms

Individual alarms activate for high levels, such as >20 mSv/year. Immediate alerts ensure worker safety.

Exposure History

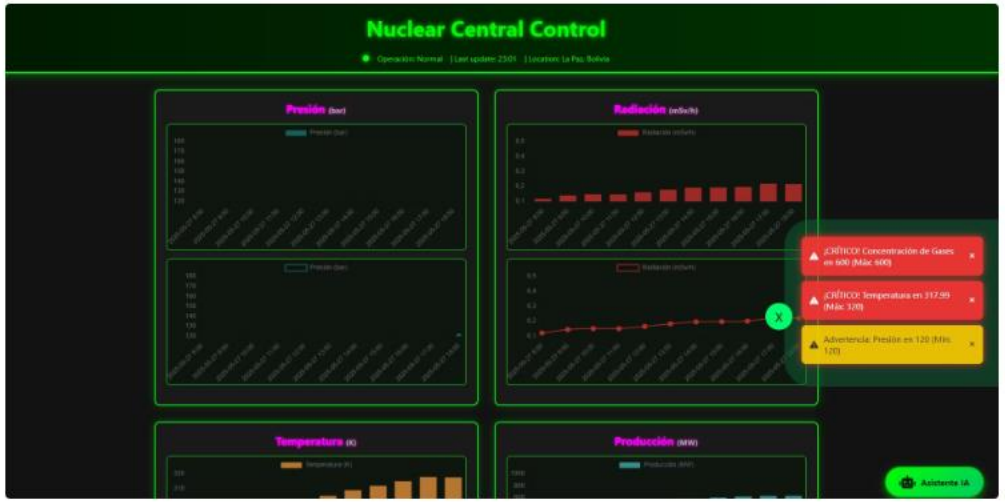
A comprehensive history of exposure is maintained. This verifies adherence to regulatory limits.

Portable Sensors

Integrated portable sensors provide real-time data. This enhances worker protection and monitoring.

Protecting personnel is paramount in nuclear operations. The system provides real-time dose monitoring and immediate alerts. This proactive approach ensures worker safety and compliance.

Integration and Visualization: The Webpage as Control Center



The intuitive webpage acts as a central control hub. It features clear graphics and both visual and auditory alarms. Secure, restricted access ensures only authorized personnel can interact. All events are logged for auditing and record-keeping.

Conclusion: A Vital System for Nuclear Safety

24/7

Continuous Monitoring

Ensuring constant vigilance and immediate response capabilities.

99.9%

Reliability

Achieving high uptime and data accuracy for critical decisions.

$0

Investment

Reflecting our commitment to safety and environmental protection.

This comprehensive monitoring system is crucial for nuclear safety. It facilitates rapid emergency responses and ensures regulatory compliance. Our ongoing investment underscores dedication to protecting people and the environment.

THANKS!