第26回原子力委員会 資料第1号



GLOBAL LEADERSHIP IN NUCLEAR SAFETY

WANO and the Commercial Nuclear Industry





Japan Atomic Energy Commission Meeting

25 July 2023

DISTRIBUTION CLASSIFICATION: OPEN

What is WANO?



- Formed by commercial nuclear power industry in 1989
- Vision: WANO and its members will be worldwide leaders in pursuing excellence in operational nuclear safety for commercial nuclear power
- Mission: To maximise the safety and reliability of nuclear power plants worldwide by working together to assess, benchmark and improve performance through mutual support, exchange of information, and emulation of best practices
- Membership: More than 125 members with approximately 460 operating units worldwide and 60 under construction every commercial nuclear power plant operator in the world is a member
- Structure: Regional centres in Tokyo, Atlanta, Moscow and Paris, with offices in London and Shanghai

WANO's strategy is focused on three key areas







A Safe, Reliable and Sustainable Industry

A Strong, Adaptable and Sustainable WANO

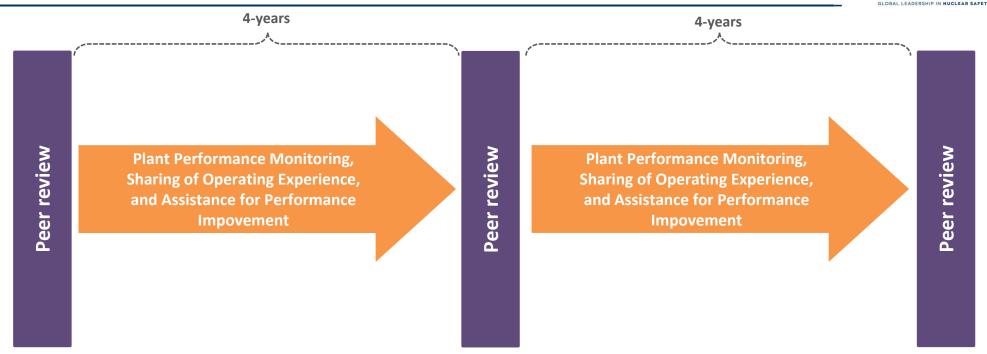
WANO standards of excellence



- Since WANO's formation in 1989, great improvements made in safety and performance of nuclear power stations
- WANO Performance Objectives and Criteria are standards of excellence that promote the highest levels of performance in the operation, maintenance, support and governance of commercial nuclear facilities
- WANO standards reflect the highest international practices of
 operation. Therefore, even the strongest performers have gaps between current performance and the highest standards
- WANO helps plants to identify areas for improvement, and then coordinates WANO and industry resources to help plants improve

Member interaction cycle - operating stations





WANO provides Operating Experience Reports, Performance Indicators, Guidelines and Good Practices, and information gained from more then 3 decades of worldwide operations

Corporate Peer Reviews are conducted at 6-year intervals

Recent Industry Performance



- Overall industry performance is improving slowly
- Two adverse trends were recently identified:
 - Increase in Significant Events (events that may cause some reduction in nuclear, radiological, or conventional safety or operational reliability
 - Increase in Loss of Offsite Power (LOOP) events
- WANO is working with members to address these trends and further improve industry performance

Influencing the future of Global Nuclear Power



- An important way WANO approaches the future of nuclear power is through its New Unit Assistance (NUA) service
- Through NUA, WANO helps members safely, efficiently and effectively move through the new plant construction process, and transition into safe and reliable commercial operation
- WANO provides an Operational Readiness Assessment (ORA) about 12-18 months before first fuel load to help the member identify any gaps to be addressed prior to operation
- Pre-startup Peer Review is conducted about 2-3 months before first fuel load to help operators further ensure the plant is ready for operation
- NUA reduces risk of setbacks during construction, a delay to startup, or reliability issues in the transition to commercial operation

Influencing the future of Global Nuclear Power



- New technologies
 - Nuclear fleet will soon be affected by full-scale deployment of innovative nuclear technologies, including Small Modular Reactors (SMRs)
 - WANO will help ensure nuclear safety culture is embedded in operation of new technologies
- Extended operating life
 - Many plants are considering extension of operating life to 60 years or beyond
 - WANO will support the safety of all nuclear units through conclusion of commercial operation

Ensuring the safety of nuclear power plants near Armed Conflict



- WANO has closely monitored the situation in Ukraine since its outset
- WANO's Governing Board has directed the Association to assist
 Ukraine to the extent possible in ensuring nuclear safety
- WANO remains in regular contact with its Ukrainian member, and has provide some assistance via virtual means
- WANO works closely with the International Atomic Energy Agency (IAEA), which has staff at each plant site in Ukraine. IAEA is one of the most accurate and credible sources of information about the nuclear plant situation in Ukraine

Focus on Zaporizhzhya Nuclear Power Plant



WANO Executive Task Force on Zaporizhzhya NPP established to help ensure timely and

accurate exchange of information

- Safety status of Zaporizhzhya is Compromised
 - Degraded status of 7 Nuclear Safety Pillars established by IAEA
 - Loss of Offsite Power events
 - Loss of Kakhovka reservoir



Source: Image Planet Labs from Aviationweek.com



Source: Image Google Maps from European Nuclear Society





- WANO calls on all parties to:
 - Prevent further damage to offsite power sources
 - Respect the need to protect on-site electrical capabilities
 - Refrain from military operations at or near NPPs
 - Keep reactors at ZNPP in nuclear shutdown until independent assessment of nuclear safety can be conducted



WANO statement on Nuclear Safety at Zaporizhzhia Nuclear Power Plant

WANO continues to believe that one of the most accurate and credible sources of information about the credit on the state of the sources of information about WAND continues to believe that one of the most accurate and credible sources of information about the situation at ZNPP is from IAEA, which has staff on site. The links to key recent IAEA statements

Update 166 - IAEA Director General Statement on Situation in Ukraine | IAEA Update 166 - IAEA Director General Statement on Situation in Ukraine | IAEA Update 166 - IAEA Director General Construction of Construction in Ukraine | IAEA Update 166 - IAEA Director General Construction of Construction in Ukraine | IAEA Update 166 - IAEA Up Update 165 - IAEA Director General Statement on Struction in Ukraine | IAEA MEAD International Statement to the IAFA Board of Governors INFA

AAEA Director General Statement to United Nations Security Council | IAEA Note that in the statement to the United Nations Security Council, the IAEA 7 pillars of Nuclear

Note that in the statement to the United Nations Security Council, the IAEA 7 pillars of Nuclear safety were supplemented by 5 specific concrete principles. WANO supports these requested Throughout the conflict in Ukraine WANO has been steadfast in its view that the operators at the NDDs misses has able to cafely negroup their vital work without interference in our view conditions. Introughout the conflict in Ukraine WANU has been steadiast in its view that the operators at the NPPs must be able to safely perform their vital work without interference. In our view, conditions on a vice that challance the NPP operators and radius the margin of nuclear cafety. NPPs must be able to sately perform their vital work without interference. In our view, condinue to exist that challenge the NPP operators and reduce the margin of nuclear safety.

- 1. Prevent further damage to offsite power sources that provide essential electricity to nuclear Prevent further damage to offsite power sources that provide essential electricity to nuclear power stations, and allow repair of redundant off site power sources. Grid instabilities are causing the power sources and allow to control and cool.

 The power source and allow repair of redundancy further complicated one part of a billion to control and cool.

 The power source are allowed to the power sources are allowed to the power sources.

 The power source are allowed to the power sources are provided to the power sources. The power sources are allowed to the power sources are allowed to the power sources are provided to the power sources.

 The power sources are allowed to the power sources are provided to the power sources. The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources. The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allowed to the power sources are allowed to the power sources.

 The power sources are allowed to the power sources are allo
- power stations, and allow repair of redundant on site power sources. Grid instabilities are causing NPP plant transients. Loss of redundancy further complicates operators' ability to control and cool reactions of the provided to the provi NPP plant transients, Loss of redundancy turther complicates operators: ability to control and co reactors and fuel pools. At Zaporizhzhia NPP, backup power lines should be returned to service. 2. Respect the need to protect on site electrical capabilities by preventing direct damage to 2. Respect the need to protect on site electrical capabilities by preventing direct damage to emergency generators or loss of ability to fuel or cool these components if offsite power is lost. emergency generators or loss of ability to Tuel Or Cool Triese components it Offsite power is Spray ponds, on site reservoirs, and ultimate heat sinks must be maintained available. At
- Spray ponds, on site reservoirs, and unimate near sinks must the mainitained avail Zaporizhzhia MPP, the secondary Cooling pond must be protected from damage.
- 3. Refrain from military operations on or near NPPs that could cause additional damage to safety

4. Given the above situation, WANO requests that the reactors at Zaporithzhia NPP remain in 4. Given the above situation, WANO requests that the reactors at Laporithzinia MFF remain nuclear shutdown at this time and that no units be returned to nuclear operation until an independent of nuclear specific and the conductant on the future to be no nuclear snutdown at this time and that no units be returned to nuclear operation units an independent assessment of nuclear safety can be conducted on site in the future, to be performed which is WAMIO's common independent assessment of nuclear safety can be conducted on site in the future, to be performed by IAEA, WANO also plans to conduct an operational readiness review, which is WANO's common arranged shifting the conduction of the

Open Distribution: Copyright @ 2023 by the World Association of Nuclear Operators. Not for sale or commercial use. All other

WANO relationship with regulatory bodies



- WANO and nuclear regulatory bodies share a common goal of ensuring the safety but approach the goal differently
- Regulators assure that nuclear stations fully comply with technical specifications to ensure plants meet regulatory safety standards
- WANO assesses stations against highest international standards of excellence, coordinates industry resources to help all stations achieve and sustain excellence
- At a global level, no formal WANO relationship with regulators
- WANO regional centres may interact with regulators, primarily to ensure no overlap in activities
- WANO collaborates closely with IAEA to maximise the efforts of both organisations to enhance nuclear safety



THANK YOU FOR LISTENING

FOR MORE INFORMATION PLEASE VISIT

Public <u>wano.info</u>

WANO Members <u>members.wano.org</u>