



PREPARING FOR THE FUTURE BY IMPROVING THE PERFORMANCE OF TODAY'S NUCLEAR STATIONS: THE WANO PERSPECTIVE

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Abstract

The World Association of Nuclear Operators, (WANO) was established in 1989 in the aftermath of the Chernobyl accident with the mission of maximizing the safety and reliability of nuclear power plants by exchanging information and encouraging communication, comparison and emulation among its members. All nuclear power stations in the world are WANO members. WANO conducted an Internal Review in 1997 and its report issued this January confirms that the WANO mission is still valid. As a result of the Internal Review, WANO is taking actions to further improve its programmes. WANO's effort to keep members conscious of safety culture in their daily work at plants is a key element for improving operational safety. WANO will be able to contribute to the future of the nuclear industry by encouraging members to actively participate in WANO programmes which are aimed at improving nuclear safety and plant performance.

1. INTRODUCTION

The World Association of Nuclear Operators, which we call WANO for short, was established in 1989 in the aftermath of the Chernobyl accident with the mission of maximizing the safety and reliability of nuclear power plants by exchanging information and encouraging communication, comparison and emulation among its members.

WANO activities are conducted through Regional Centres located in Atlanta, Moscow, Paris and Tokyo under the integrated leadership of the WANO Governing Board consisting of representatives of these Regional Centres. In addition, WANO has a Co-ordinating Centre in London which coordinates regional activities to enhance co-operation and to enhance effectiveness by enabling close communication and avoiding duplication.

Currently all 440 nuclear power plants in commercial operation around the world and the 130 operators of these plants belong to WANO and work together to fulfil its mission. WANO Tokyo Centre consists of six Ordinary Members listed below running 31 nuclear power stations with 83 plants in operation and 18 plants under construction.

- Pakistan Atomic Energy Commission
- China National Nuclear Corporation
- Nuclear Power Corporation of India
- Taiwan Power Company
- Korea Electric Power Corporation
- Japanese Nuclear Operators

2. INTERNAL REVIEW

Last May, at the 1997 WANO Biennial General Meeting in Prague, the implementation of an Internal Review was announced as a joint idea of Mr Rémy Carle, outgoing WANO Chairman, and Dr Zack Pate, new WANO Chairman, to review the current status of WANO and to guide WANO's future development. At that time, eight years had passed since WANO was inaugurated in 1989. Since

its formation, WANO has made Nuclear Network available as a handy daily tool of communication for members and Centres, and it has established various technical programmes to assist in the improvement of plant performance such as Event Reporting, Exchange Visits, Workshops/Seminars, Performance Indicators, Good Practices and Peer Reviews.

Mr Bob Franklin and Mr Ray Hall were appointed to lead the Internal Review. They vigorously visited members all over the world and ended up with 190 interviews with individuals and groups of WANO members. The report summarizing the inputs collected widely from the members was issued this January.

The most essential indication of the Internal Review Report was the confirmation that the WANO mission established at the time of the WANO inauguration is still valid. The report also pointed out that more effort should be made to attract the attention of plant managers so that WANO programmes penetrate into member power plants more deeply.

The contribution of the Institute of Nuclear Power Operations, INPO for short, to serve as a model for many WANO programmes is well known. The Internal Review report indicated that it was a unanimous opinion among WANO members that INPO programmes and INPO's approach to solving problems were so good that WANO should try to adopt INPO methods wherever appropriate.

The report also outlined various areas to be further improved in reinforcing individual programmes. Consequently, programmes were prioritised to increase effectiveness, existing WANO programmes were realigned, and a few new programmes were added. As shown in the new programme alignment, WANO has four programme areas under which some individual programmes are classified.

The new WANO programme realignment is as follows:

- Operating Experience
- Peer Review
- Professional & Technical Development
 - Workshops/Seminars/Courses
- Technical Support & Exchange
 - Good Practices
 - Operator Exchanges
 - Performance Indicators
 - Technical Support Missions

3. WANO PROGRAMMES

Operating Experience, at the top of the list, is deemed the most basic of the WANO programmes. WANO intends to improve this programme and make WANO event reports of such high quality that they cause plant managers to take prompt action to ensure that similar events are prevented at their stations. To increase the effectiveness of this programme, WANO has revised reporting criteria, adopted the IAEA's IRS (Incident Reporting System) coding system, and established a Central WANO Operating Experience team.

Peer review is regarded as the strongest programme in WANO containing elements of all WANO programmes. A peer review is an on-site review using peer knowledge and credibility to offer valuable information to a host plant. The WANO Policy Guideline on Peer Reviews stipulates that a

peer review should be a voluntary programme initiated at the request of a WANO member utility, that the scope of a peer review should be decided by the host utility, and that a formal report documenting key issues should be written. Follow-up on the areas for improvement identified is totally at the discretion of a host plant. A peer review is to be conducted for all or some of the nine areas:

- Organization and Administration
- Operations
- Maintenance
- Engineering Support
- Training and Qualification
- Radiological Protection
- Chemistry
- Operating Experience
- Emergency Preparedness

A peer review focuses on how plant people perform their daily work rather than how well plant programmes are written. The team consisting of international peers develops “Strengths” and “Areas for Improvement” referring to WANO Performance Objectives and Criteria as the standard of excellence. Strengths identified by the team may be useful to other member utilities. Areas for Improvement identify where operational improvements are possible to achieve excellence at a host plant. WANO can also assist a utility to develop and implement an action plan to address the Areas for Improvement identified by the review team. In addition, reviewers bring back experience gained during a peer review to be utilized for self-assessment at their own plants.

Professional & Technical Development includes workshops, seminars and various courses. They aim to exchange specific experiences among members in more depth. Workshops/seminars is one of the initial WANO programmes and has been appreciated as an effective programme. Courses are rather new and are designed to reinforce WANO members' areas of weakness. Some of these are INPO courses made available through the WANO channel.

Technical Support & Exchange includes four programmes, namely Good Practices, Operator Exchanges, Performance Indicators and Technical Support Missions. Good Practices are collected and disseminated to be shared widely among members, which enable members to learn from each other's best practices and improve their own operational safety and reliability. Members can search Good Practices when they seek specific, tried and proven methods and ideas for improving performance. WANO focuses on quality when identifying Good Practices, and selected Good Practices are posted on the WANO Web site while all the Good Practices presented by members are accumulated in a database for retrieval.

Operator Exchanges enable members to directly share plant operating experiences and ideas for improvement through face-to-face contact between nuclear power plant staff. Members can share best methodologies and high standards as a means of promoting improvements in nuclear safety and reliability. If things go well and interests and benefits agree, this programme may develop to be a twinning agreement for a longer and more formal phase of information exchange.

Performance Indicators support the exchange of operating experience information by collecting, trending and disseminating nuclear power plant performance data in the following ten key areas:

- Unplanned Automatic Scrams per 7000 Hours Critical

- Safety System Performance
- Unplanned Capability Loss Factor
- Unit Capability Factor
- Thermal Performance
- Fuel Reliability
- Collective Radiation Exposure
- Volume of Low Level Solid Radioactive Waste
- Chemistry Index
- Industrial Safety Loss-time Accident Rate

WANO Performance Indicators provide a common standard and a quantitative indication of plant performance for self-assessment and comparison with other plants for improvement. WANO members share plant-specific data to allow consistent comparison of performance and encourage emulation among member plants, which can be utilized as a management tool.

Technical Support Missions is a new programme intended to establish within WANO the capability to provide technical service to meet members' specific needs and requests. WANO wishes to respond to members' needs within the limit of WANO's resources, ability and expertise.

To facilitate and activate these WANO programmes, WANO has its own secure network called WANO Network which is used as a tool for direct contact among members and Centres.

4. UNIQUE FEATURES OF WANO

WANO has some unique features. First of all, as explained in the earlier section on WANO membership, all nuclear power plants in the world are WANO members. This means that through WANO, members can learn from the experience of others, whether it is good or bad -- which is a great advantage.

Secondly WANO members have a common aim, that is to improve operational safety in their power plants. Plant managers without exception hope that safety culture roots deeply in the minds of plant staff in their daily work, and that the whole plant makes every effort to carry out their jobs with safety culture in mind. However, safety culture is very vulnerable. No matter how hard work plant people work, once they think their plant is safe, the safety of the plant starts decaying in that instant. Let me remind you that safety culture is a daily thing, and can never be completed. Modesty is essential for the people at a plant because self-satisfaction immediately destroys safety culture. Participation in WANO programmes and communicating with various fellow plant staff all over the world can keep plant people alert and encourage unflinching efforts for safety. And this is what WANO can be proud of.

Another feature of WANO is that it is a private organization where voluntary participation and mutual cooperation of members are essential. Since the nuclear industry is so interdependent, members must assist a plant with problems without expecting any reward. If something serious happens at any plant in the world, no other plant can avoid its influence. We say in WANO that we are only as strong as our weakest plant. When a weaker member becomes stronger, the entire nuclear industry becomes stronger and that is WANO's aim -- improved safety and reliability of nuclear power plant operation.

5. RELATIONSHIP WITH THE IAEA

While the roles of the IAEA and WANO are different, they are complementary when it comes to the nuclear safety of power generation. WANO aims to maximize the safety and reliability of nuclear power plant operation while IAEA covers wider range of activities. As Dr Blix, former Secretary General of the IAEA, stated on the occasion of 1995 WANO Biennial General Meeting in Paris, "IAEA should not do what WANO can do." Therefore, the organizations co-ordinate their activities to prevent overlap. Meeting safety regulations is the minimum requirement for a plant. Additional spontaneous efforts of operators are essential to achieve safety in the true sense of the word. WANO can fulfil its mission simply by implementing its activities.

6. CONCLUSION

As the title of this presentation suggests, "Preparing for the Future by Improving the Performance of Today's Nuclear Stations," the future of the nuclear business depends on the enhancement of the performance of nuclear power plants. Nuclear generation today faces difficulty in many countries, and the enhancement of performance of nuclear power plants will be a substantial factor for the future success of the nuclear business. In this context, WANO can contribute to the future of the nuclear industry by providing a forum through which nuclear utilities world-wide can improve their safety and reliability.