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2014 Year-End Highlights Report



W A N O

global leadership in **nuclear safety**
WANO

WORLD ASSOCIATION OF NUCLEAR OPERATORS

WANO's Vision:

WANO and its members will be worldwide leaders in pursuing excellence in operational nuclear safety for commercial nuclear power.

WANO's 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.

Foreword

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Our organisation was born from the global response to a major reactor accident and celebrated its 25th Anniversary on 15 May 2014. The accident at Fukushima Daiichi in 2011 was the first reactor accident since the inception of WANO, and the lessons learned and subsequent improvement activities generated by those lessons have continued to guide WANO on its path, leading the continuous improvement of safety and reliability of commercial nuclear reactors.

The momentum gained in 2013 on the 12 Post-Fukushima projects translated into significant progress in 2014 with plans being executed in earnest. Cross-regional working groups collaborated to develop policy changes for the more complex and far-reaching of the projects, while smaller projects moved rapidly from planning into implementation. In 2014, the lessons learned from Fukushima became visible to WANO members through clear actions.

THE MOMENTUM GAINED IN 2013 ON THE 12 POST-FUKUSHIMA PROJECTS TRANSLATED INTO SIGNIFICANT PROGRESS IN 2014.

Arguably the crowning achievement of 2014 was the approval and implementation of the WANO Assessment policy. Implementation of the WANO Assessment (sometimes referred to as grading), was the realisation of one of the most challenging of the Post-Fukushima Commission's recommendations, and this achievement is a cultural shift in WANO that was

only possible through members' trust and commitment to the organisation's principles. As such, the Assessments represent a significant step in the evolution of WANO. Approval of the policy was granted by the Governing Board in September 2014 and, with training already completed in the regional centres, implementation started almost immediately. The cross-regional cooperation and member accountability necessary to make this historic step cannot be overstated.



JACQUES RÉGALDO, CHAIRMAN



DUNCAN HAWTHORNE, PRESIDENT



KEN ELLIS, CHIEF EXECUTIVE OFFICER

Further progress was made in 2014 to establish more effective cross-programme integration, communication, cooperation and vision. Analysis of Peer Review programme areas for improvement (AFIs) was correlated to Operating Experience (OE) programme analysis, revealing common weaknesses in several areas. These weaknesses were then used to inform the work undertaken in the Technical Support & Exchange (TS&E) programme. Output from the OE programme's SOER Implementation Tracking System (SITS) database started to be used to inform the activities of peer review teams in the field. Significant progress was achieved in 2014 but there is still much work to do to fully integrate the efforts and aims of all programmes.

Open distribution was approved as a category for WANO documents, which made it easier for WANO to promote non-sensitive information to improve the organisation's external profile. However, increased sharing of non-sensitive information in no way alters our obligation to protect our members' sensitive information. As an organisation, WANO still recognises the ongoing need for confidentiality so that member performance can be evaluated.

continued >

Foreword

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In 2014, the organisation conducted a follow-up to the WANO Internal Assessment of 2012. A cross-regional team visited every regional centre and the London Office to assess the progress made to correct the AFIs written by the 2012 assessment team. While great progress was noted on most of the AFIs written in the original assessment, some were found to need additional focus. Corrective plans were written for the AFIs needing attention and follow-up reviews were scheduled for 2015.

As 2014 drew to a close, *Compass*, WANO's new long-term plan, was under development to solidify the progress made through the post-Fukushima projects, while simultaneously starting to turn the organisational focus to the future. As foundational changes occur in our industry, WANO will continue to exercise a leadership role in maintaining its traditional uncompromising focus on safety and reliability.

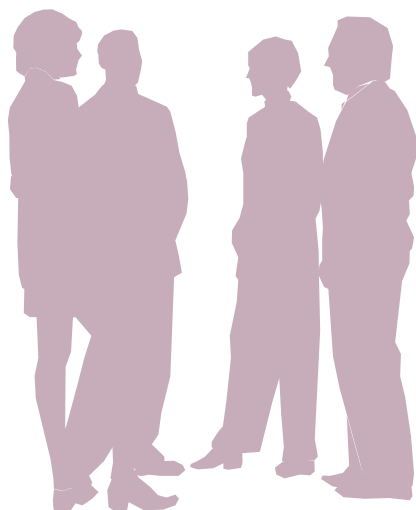
“WANO WILL CONTINUE TO EXERCISE A LEADERSHIP ROLE IN MAINTAINING ITS TRADITIONAL UNCOMPROMISING FOCUS ON SAFETY AND RELIABILITY.”



WANO Programmes

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To achieve its mission, WANO offers members a series of high-quality products and services through four main programmes:



1. Peer Reviews

Peer reviews help members compare their operational performance against standards of excellence through an in-depth, objective review of their operations by an independent team from outside their organisation.

During 2014, WANO conducted 46 operating plant peer reviews in 17 countries/areas. It also conducted 27 follow-up reviews in 14 countries/areas focusing on the progress made in addressing areas for improvement. Since 1992, WANO has conducted 618 operating station peer reviews in 31 countries/areas, including at least one at every WANO member station.

Efforts continue to ensure each plant receives a peer review every six years or more frequently. WANO plans to move to peer reviews every four years such that between October 2015 and October 2019 every operating unit will receive a peer review.

46
OPERATING PLANT
PEER REVIEWS
CONDUCTED

Ten pre-startup peer reviews were conducted in 2014 at plants preparing for initial operation, compared to five such reviews in 2013. Some construction plans had slowed or been put on hold following the Fukushima accident in 2011 so companies could evaluate the lessons learned. With many of those evaluations complete in 2013, construction activities in several countries had resumed and so this significant increase in pre-startup peer reviews was something that WANO had expected to see through 2014 and 2015.

Eight corporate peer reviews took place in 2014. All members have agreed to receive a corporate peer review by the end of 2017.

618
PEER REVIEWS
CONDUCTED IN
31 COUNTRIES /
AREAS SINCE 1992

WANO Programmes

2. Operating Experience

The Operating Experience Programme informs members about incidents at other plants so they can take corrective actions to prevent similar occurrences at their own plant. Its success stems from the willingness of WANO members to openly share their Operating Experience for the benefit of other operators throughout the world.

In 2014, 2,352 operating experience reports were provided by members, a 39% increase over reporting in 2013. This brings the number of event reports available in the OE database to 16,420.

The WANO Operating Experience team issued seven analysis reports in 2014 as well as three new Significant Event Reports to provide important and urgent lessons for the industry.

In 2014, four existing Just-In-Time (JIT) briefing sheets were revised. JIT sheets provide workers at nuclear power plants with practical, timely operating experience for pre-job briefings. In addition, two Hot Topics and one CEO Update were issued, and WANO Reference Manual MN 01, *Operating Experience Programme* and



2,352

OPERATING
EXPERIENCE REPORTS
PROVIDED BY WANO
MEMBERS

213

TECHNICAL
SUPPORT MISSIONS
CONDUCTED

WANO Programme Guideline WPG 02, *Operating Experience* were revised.

The Operating Experience Central Team continues to issue monthly summaries of all events reported to WANO. This summary is posted on the members' website to highlight events of potential significance to other members that may provide meaningful lessons learned.

3. Technical Support and Exchange

In 2014, 213 technical support missions (TSMs) were conducted, comparing to 199 in 2013. TSMs are planned and conducted by WANO regional centres using an experienced team of knowledgeable experts who review difficult issues and identify potential solutions.

A new project, the New Unit Assistance (NUA) programme, was initiated in April 2014. The focus of NUA is to develop a framework that will be helpful for WANO TSM managers to plan, develop and conduct special assistance missions for new entrants

in the nuclear industry. All regional centres and WANO programmes participated in this project. A founding principle for NUA is that early intervention with new members will significantly help them in their preparation towards operation.

All regional centres continue to focus TSMs on helping members resolve areas for improvement (AFIs) identified during peer reviews. In 2014, the percentage of TSMs focusing on peer review results was 71.7% for Atlanta Centre, 57.5% for Moscow Centre, 71.4% for Paris Centre and 34.4% for Tokyo Centre.

WANO performance indicators (PI), which provide a method for members to assess the performance of their plants against an international benchmark, showed industry and individual unit performance against the targets saw little change from 2013 results in PI target areas, with stability or modest progress in most areas.

In addition, eight Good Practices were published, and one Guideline and one Principle were revised. The most prevalent topic of good practices was Maintenance.

WANO Programmes

4. Professional and Technical Development

One way to prevent accidents is to help staff increase their skills and knowledge so they can deal with safety issues before they become problems.

In 2014, the regional centres organised 46 WANO-specific events with this ideal in mind, including 28 workshops, 15 seminars, one expert meeting and two training courses. This exceeded the WANO goal of 25 such activities per year.

In addition, WANO London sponsored small-group chief executive officer (CEO) meetings in Helsinki, Finland; Bay City, Texas (US); and Madrid, Spain; to obtain high-level member feedback and input on WANO programmes and strategic direction.

In September, the WANO Site Vice Presidents' and Plant Managers' Conference was conducted in Düsseldorf, Germany. The theme of *Strengthening Station Performance* provided the opportunity to update WANO

46 WANO WORKSHOPS, SEMINARS & EXPERT MEETINGS



leaders on the progress associated with the Post-Fukushima Commission projects and to allow those leaders to share how the projects have been implemented at their stations to improve performance.

Planning also began for the 2015 WANO Biennial General Meeting (BGM), which will be held in Toronto, Canada, under the theme, *Shaping the Future of the Nuclear Industry*.

5. Communications

Communications was established as a programme in September 2013, with the Communications programme director providing leadership and oversight of Communications activities within the regional centres and London Office.

In 2014, the majority of WANO publications and digital products were launched or timed for publication in the run up to the WANO 25th Anniversary, which occurred on 15 May 2014. Some of the more notable products include the new-look [WANO public website](#),

featuring an interactive [WANO member world map](#); the brand new [Inside WANO microsite](#), housing all current articles and past content; a fast-paced and informative [This Is WANO infographic video](#) explaining what WANO is and what it does; a [25th anniversary souvenir brochure](#); and two [25th anniversary videos](#).

Use of WANO social media channels, Twitter, Facebook and LinkedIn continued to grow in 2014, following their launch in February 2013 as part of the Post-Fukushima Commission's recommendation to increase WANO's visibility.

Four editions of *Inside WANO* were published in 2014. The magazine was re-launched as an online-only publication, which has not only saved members money in production costs but has also seen continuous growth in subscribers month-on-month since the hardcopy of the magazine was discontinued.

Governance and Structure

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The leadership of WANO remained relatively stable in 2014, following the major changes in leadership roles in 2013. Jacques Régaldo of EDF continued in the position of Chairman of the WANO Governing Board while Duncan Hawthorne of Bruce Power remained WANO President, and Ken Ellis also continued as Managing Director.

Dr Naoki Chigusa joined the Executive Leadership Team as WANO's Tokyo Centre Director on 1 July, replacing Mr Harunobu Shirayanagi.

In September 2014, the title of managing director was changed to chief executive officer (CEO) by the membership in an Extraordinary General Meeting (EGM) held as a part of the Governing Board meeting in Toronto. This change was to better reflect the role and responsibilities of the position.

Four new governors joined the WANO Governing Board in 2014. Christopher Crane succeeded Gary Gates as an Atlanta Centre member and Yuriy Nedashkovsky was voted in to replace Mykyta Konstantinov as a Moscow Centre member. Additionally, Mitsuo Matsui replaced Shreyans Kumar Jain as Chairman of the Tokyo Centre Governing Board and Pedro de Figueiredo replaced Philippe Van Troeye as Chairman of the Paris Centre Governing Board; both becoming members of the WANO Governing Board.



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NEW MEMBERS OF WANO'S
GOVERNING BOARD

WANO: Growing to meet the needs of an expanding industry

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At the end of 2014, there were 126 members in WANO's four membership categories.

Membership changes in 2014 reflected the effects of new construction, industry reorganisations, and the permanent shutdown of several units. As a result, the number operating units in WANO membership grew even while the number of WANO members declined. Eight new units connected to the grid while four units were decommissioned and one unit, Vermont Yankee, entered permanent shutdown.

A reorganisation of German utilities from independent Category 1 memberships to Category 2 memberships under VGB, resulted in a combined decrease of five memberships in WANO. Similarly, following the merger of Constellation Energy Nuclear Group (CENG) with Exelon in the US, CENG voluntarily terminated its membership with WANO.

Black and McDonald, who joined WANO as a Category 3 member in 2013, and Enel, a long-term WANO Category 3 member, both ended their WANO memberships at the end of 2014.

126
WANO MEMBERS



WANO Members*

*Member data as of July 2015

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ATLANTA CENTRE

Ameren Missouri

American Electric Power

Atomic Energy of Canada Limited

Bruce Power

Centrala Nuclearelectrica Cernavoda

China Huaneng Group

China Power Investment Corporation

Comision Federal de Electricidad

Dominion

DTE Energy Corporation

Duke Energy Corporation

Emirates Nuclear Energy Corporation

Energy Northwest

Entergy Nuclear

Eskom

Exelon Corporation

FirstEnergy Corp.

Horizon Nuclear Power Limited

Huaneng Shandong Shidao Bay Nuclear

Power Co., Ltd

Hydro-Quebec

Institute of Nuclear Power Operations

Luminant

Nebraska Public Power District

New Brunswick Power

NextEra Energy, Inc.

Omaha Public Power District

Ontario Power Generation

PG&E Corporation

Pinnacle West Capital Corporation

PPL Corporation

Public Service Enterprise Group, Inc.

SCANA Corporation

Southern Nuclear Operating Company

State Nuclear Power Demonstration Plant

State Nuclear Power Technology

Corporation (SNPTC)

STP Nuclear Operating Company

Tennessee Valley Authority

Wolf Creek Generating Station

Xcel Energy Inc.

Eletronuclear - Eletronuclear

S.A. (S)

WANO Atlanta Centre

(S) = secondary affiliation

WANO Members*

*Member data as of July 2015

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MOSCOW CENTRE

"Haykakan Atomayin Electrakayan" CJSC

CEZ, a.s.

Concern Rosenergoatom

Federal State Unitary Enterprise of Atomic
Fleet (FSUE "Atomflot")

Fortum Power and Heat Oy

Ignalina Nuclear Power Plant

Jiangsu Nuclear Power Corporation

JSC "Atomenergoremont"

JSC "Atomtechenergo"

JSC "Atomtechexport"

JSC OKB "Gidropress"

Kozloduy NPP Plc

MVM Hungarian Electricity Private

Limited Company

MVM Paks Nuclear Power Plant Ltd

NNEGC "Energoatom"

Nuclear Power Production and

Development Company of Iran

Republican Unitary Enterprise Belarusian

Nuclear Power Plant

Slovenské elektrárne, a.s.

State Specialized Enterprise "Chernobyl

NPP"

VNIIAES

WANO Moscow Centre

WANO Members*

*Member data as of July 2015

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PARIS CENTRE

Asociación Nuclear Ascó - Vandellós II,
A.I.E. (ANAV)

Axpo AG

BKW-FMB Energie AG

CC.NN. Almaraz-Trillo, A.I.E.

China General Nuclear Power Corporation
(CGN)

Daya Bay Nuclear Power Operations and
Management Co., Ltd

E.ON Kernkraft GmbH

EDF

EDF Energy

Electrabel

Eletronuclear - Eletronuclear
S.A.

EnBW Kernkraft GmbH

Forsmarks Kraftgrupp AB

Fujian Ningde Nuclear Power Co.

Gas Natural

Guangxi Fangchenggang Nuclear Power
Co., Ltd (FCGNP)

IBERDROLA Generación Nuclear, S.A.

Kernkraftwerk Gösgen-Däniken AG

Kernkraftwerk Leibstadt AG

KSU AB

Liaoning Hongyanghe Nuclear Power Co.,
Ltd

Magnox Ltd

N.V. elektriciteits - Produktiemaatschappij
Zuid - Nederland (EPZ)

Nuclear Decommissioning Authority

Nuclenor, S.A.

Nucleoeléctrica Argentina S.A. (NA-SA)

Nuklearna Elektrarna Krško

Gas Natural

Guangxi Fangchenggang Nuclear Power
Co., Ltd (FCGNP)

Ringhals AB

RWE Power AG

Sellafield Ltd

Swedish Nuclear Fuel and Waste
Management co. SKB

Swissnuclear

Taishan Nuclear Power Joint Venture Co.

Ltd

Teollisuuden Voima Oyj (TVO)

Vattenfall AB

VGB PowerTech e.V.

Yangjiang Nuclear Power Co., Ltd (YJNP)

WANO Paris Centre

WANO Members*

*Member data as of July 2015

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TOKYO CENTRE

China National Nuclear Corporation

Chubu Electric Power Company, Inc

Electric Power Development Co., Ltd

Fujian Fuqing Nuclear Power Company Ltd

Hainan Nuclear Power Co., Ltd

Hokkaido Electric Power Company Inc

Hokuriku Electric Power Company Inc

Japan Atomic Energy Agency

Japan Nuclear Safety Institute

Japanese Nuclear Operators (JNO)

Korea Hydro & Nuclear Power Co., Ltd

Kyushu Electric Power Company, Inc

Nuclear Power Corporation of India

Limited

Nuclear Power Qinshan J.V.C., Ltd

Pakistan Atomic Energy Commission

Qinshan Nuclear Power Company Ltd

Sanmen Nuclear Power Company Ltd

Shikoku Electric Power Company, Inc

Taiwan Power Company

The Chugoku Electric Power Company, Inc

The Japan Atomic Power Company, Inc

The Kansai Electric Power Company, Inc

Tokyo Electric Power Company Inc

Third Qinshan Nuclear Power Company,
Ltd

Tohoku Electric Power Company,
Incorporated

Emirates Nuclear Energy Corporation (S)

WANO Tokyo Centre

(S) = secondary affiliation



ATLANTA
LONDON & HONG KONG
MOSCOW
PARIS
TOKYO

