



IAEA

International Atomic Energy Agency
Atoms for Peace and Development

IAEA Activities on Nuclear Energy

71st NDC Meeting
10-11 July 2019

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International Atomic Energy Agency

A Global Forum: Innovation for the Future of Nuclear Energy



JUNE 10–12, 2019
GYEONGJU, SOUTH KOREA



A GLOBAL FORUM

This forum will focus on accelerating deployment of innovative solutions to address the most urgent challenges facing the sustainability of nuclear power generation.



- Focus on accelerating **deployment of innovative solutions** to address the most urgent challenges facing nuclear power sustainability
- Key leaders +250 participants from 16 countries
- A call to action, **top 4 innovations** selected:

Machine learning to make better use of the 'big data' already available in the nuclear power sector for optimizing maintenance

Innovative frameworks for information exchange, to share data on research and development, operations and maintenance

Digital twinning virtual recreation of a process into a computer-based model to improve NPP performance and to reduce costs

Advanced manufacturing including 3D printing, to address supply chain challenges

TWG on NPP Operation Meetings

1st Meeting: 13-14 Sept 2018 (20 Operating MS)

- Focused on three pillars of **sustainability** of existing nuclear generation: Benefits, Expenditures and Returns
- 20 **recommendations** to the industry peers and IAEA-NE
- Encouraged inclusion of **executives** of soon-to-be operating NPPs and of regulatory bodies



2nd Meeting: 12-13 Sept 2019

(25 Operating & 2 soon-to-be operating MS)

- Review and analyze IAEA-NE **actions** taken after the 1st meeting
- Refine and extend **recommendations**

Webinar Series on Stakeholder Involvement

Webinar Series
on **Stakeholder
Involvement** related
to **Nuclear Power**

#1

Basics of Stakeholder Involvement

Understanding Stakeholder
Involvement as a Strategic Tool
for a Nuclear Power Programme



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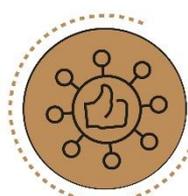
- New series launched in **June 2019**
- Aims to strengthen the capacity of Member States to develop, implement, manage and adapt effective **stakeholder involvement programmes** for nuclear power
- Held **every quarter** and covers stakeholder involvement topics, using global expertise, and based on clear learning objectives
- **Webinar #1:**
 - 93 participants
 - 55 countries
- **Webinar #2:** 3 September 2019



Topic
#2 Public
Surveys



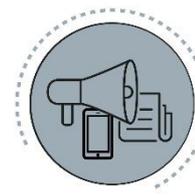
Topic
#3 Public
Information
Centres



Topic
#4 Social
Media



Topic
#5 Messaging,
Storytelling &
Plain Language



Topic
#6 Media
Relations

TM on SI and Communication for New and Expanding NP Programmes, 11-14 June 2019

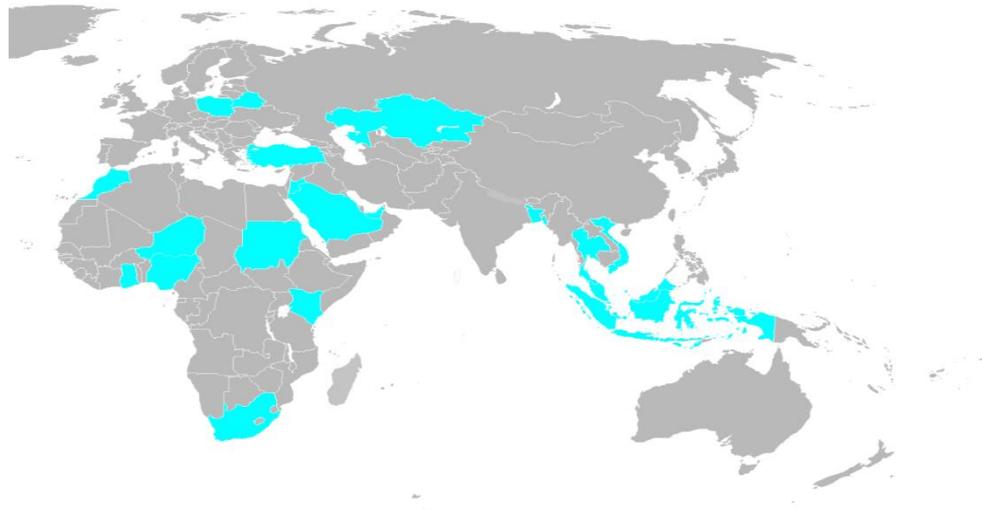


- **Objective:** Provide **practical guidance** on and share **experiences** related to stakeholder involvement and communication, on **infrastructure issues** of the IAEA Milestones Approach
- 47 participants from 29 Member States and NEA
- Information exchange on national and international **policies** and **practices**
- Keynote and workshop on **opinion research** and **public surveys**



Integrated Nuclear Infrastructure Review

- **2009-2018: 27 INIR missions in 20 MSs**



- **INIR Missions in 2019**

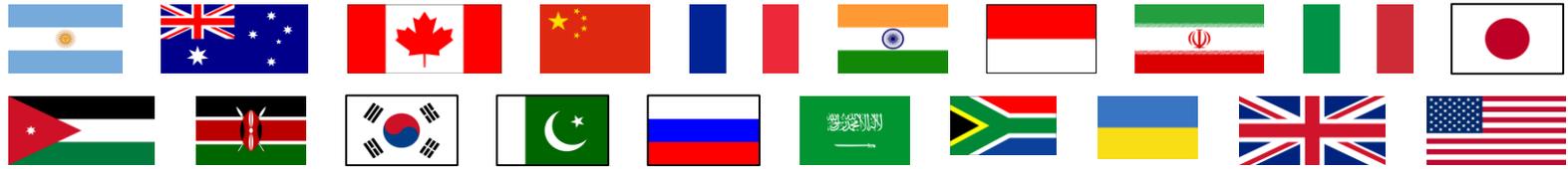
- Egypt - Phase 2
- Ghana - Phase 1 Follow-up

- **INIR Missions in 2020**

- Uganda - Phase 1
- Belarus - Phase 3
- Kenya - Phase 1 Follow-up
- Uzbekistan - Phase 2

Technical Working Group on SMR

- To advise and support **IAEA programmatic planning and implementation** in areas related to technology development, design, deployment and economics of SMRs
- **20 MSs** and two International Organizations: **EC** and **NEA** as observers



- **Three technical subgroups**
 - **SG-1:** Development of Generic Users Requirements and Criteria
 - **SG-2:** Research, Technology Development and Innovation; Codes and Standards
 - **SG-3:** Industrialization, design engineering, testing, manufacturing, supply chain, and construction technology
- Covers **non-Electric Applications** and **coupling with renewables**
- 1st TWG Meeting, 23 - 26 April 2018
- 2nd TWG Meeting, 8 – 11 July 2019

Support on SMR through Technical Cooperation

SMR/HTGR Missions



Technical Cooperation Project: Europe/Eurasia



Common Themes / actual activities:

- Design and technology status of water-cooled / non-water cooled SMRs
- Non-electric nuclear applications, options, technology readiness and toolkits
- Technology assessment training
- Infrastructure, economic and financing aspects of SMRs
- Design Specific Issues on Engineering Project, Construction and Industrial Supply Chain for SMR Deployments
- Siting of SMRs
- SMR deployment scenarios in global energy portfolio
- Design safety and safety assessment of SMRs
- Principles for Emergency Preparedness & Response for SMRs
- SMR fuel cycles and waste management, specifically for HTGRs

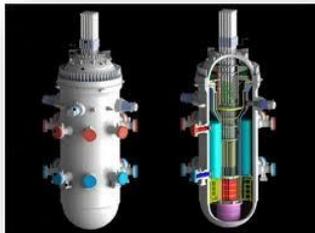
IAEA acting as the Secretariat for

- Canada
- China
- Finland
- France
- Korea
- Russian Federation
- Saudi Arabia
- United Kingdom
- United States



INPRO Dialogue Forum on SMRs

- **INPRO Dialogue Forum (DF) 17 on “Opportunities and Challenges in Small Modular Reactors”**
- Venue: Ulsan, Republic of Korea, Jul 2019
- Opening, Technical Plenaries, Wrap Up and Closing Sessions
- Plenary Technical Sessions:
 - Market Opportunities
 - Design Requirements
 - Research & Technology Development
 - Near Term Deployment Designs (presented by design authorities – designs in licensing, construction or recent deployment)



- Technology Exhibition Space
- 143 participants from 22 Member States

Coordinated Research Projects

SCWR

- Understanding and Prediction of **T/H Phenomena** Relevant to SCWR

FR

- Radioactive Release from **PFBR** under Severe Accident Conditions
- Benchmark Analysis of **FFTF** Unprotected-Loss-of-Flow Test
- Neutronics Benchmark of **CEFR** Start-Up Tests

SMR/HTGR

- Development of Approaches, Methods and Criteria for determining Technical Basis for **Emergency Planning Zone** for **SMR** Deployment
- **HTGRs applications** for energy neutral sustainable comprehensive extraction and mineral products development
- Modular High Temperature Gas-cooled Reactor **Safety Design**
- **HTGR** Physics, Thermal-Hydraulics and Depletion Uncertainty Analysis

Non-electric applications

- Assessing Technical and Economic Aspects of **Nuclear Hydrogen Production** for Near-term Deployment

GIF-IAEA Cooperation

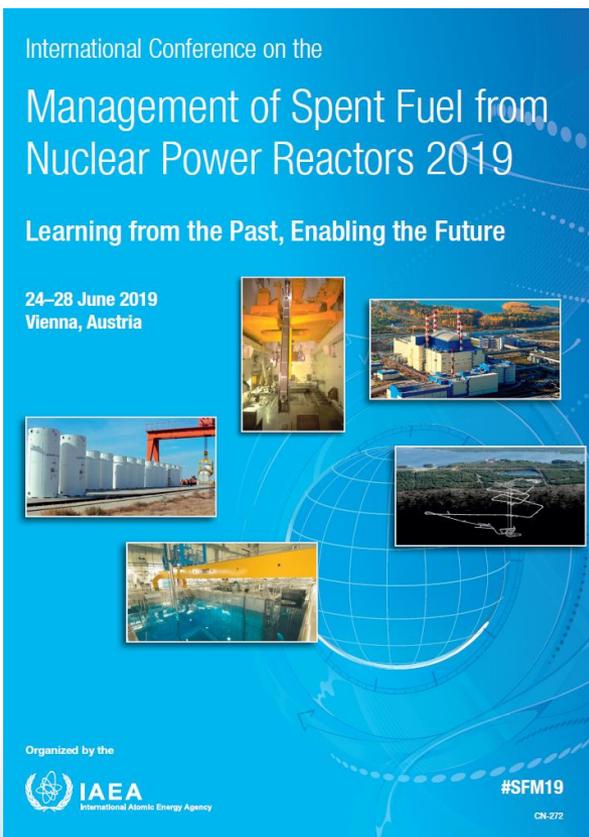
- **8th Joint GIF-IAEA Workshop on the Safety of Liquid Metal Cooled Fast Reactors**
 - IAEA Headquarters, Vienna, 20-22 March 2019
 - Over 40 participants
 - Discussions on
 - Update of SFR SDC/SDG
 - Licensing framework
 - Safety features
 - LFRs



International Conference on the Management of Spent Fuel from Nuclear Power Reactors: Learning from the Past, Enabling the Future

In-cooperation with:
OECD/NEA, EC and WNA

- Provided a forum for the exchange of information on national spent fuel management strategies, and on the ways in which a changing energy mix could influence these strategies and, in particular, on how they support the achievement of national energy goals
- **Conference Attendance**
 - 258 participants from 45 MSs and 7 IOs
 - 92 oral presentations, 31 posters and 14 E-Posters presented
 - 140 papers peer-reviewed will be included in the Conference Proceedings
- **Chair: Susan Pickering**, Director Emeritus, Sandia National Lab (USA)
- **Scope of the Conference: All steps of the Backend of the Nuclear Fuel Cycle**
 - National Strategies
 - Storage
 - Transportation
 - Recycling
 - Disposal
 - Advanced Recycling Technologies
 - Integrated Approaches
- **Young Generation Challenge**
 - 35 applications from 17 MSs: 4 winners



More information: <https://www.iaea.org/events/management-of-spent-fuel-conference-2019>
and IAEA Meetings App: <https://event.do/iaea/a/#/events/3293>

Nuclear Knowledge Management

Nuclear Knowledge Management School(NKM)
one week certified course on specialized training in development of KM program in nuclear organization

Nuclear Energy Management School(NEM)
two week program targeted at junior and mid-career professionals in nuclear sector for future leadership

Knowledge Management Assist Visit(KMAV)
IAEA facilitated fact-finding expert mission in knowledge management area

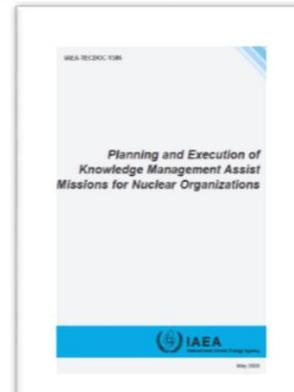
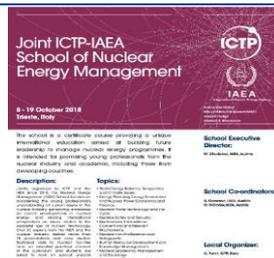
International Nuclear Management Academy (INMA)
IAEA facilitated Master program in Nuclear Technology Management

2019: 4 NKM
Korea, Russia, ICTP, Latin America
2020: 5 requests
ICTP, India, USA, Canada, Latin America

2019: 5 NEM
Russia, ICTP, USA, Egypt, Japan
2020: 10 requests
Russia x2, China, USA, Canada, Japan, Belarus, India, ICTP, Uzbekistan

2019: 6 missions & workshops
Brazil, Pakistan, Armenia, Mexico, Egypt, Bulgaria
2020: 4 requests

2 endorsed (MEPhi, University of Manchester)
4 final approval (University of Tokyo, Texas A&M, North Western (SA))
6 under assessment (HEU (China), WITS University (SA), University of Yerevan (Armenia) University of Idaho (USA), University of Budapest (Hungary), University of Ontario (Canada))



Since 1st NKM school in ICTP in 2004, 21 NKM Schools for about 700 trainees.

Since 1st NEM school in ICTP in 2010, 28 NEM Schools for over 880 trainees.

Since 1st KMAV in Krsko NPP in 2005, 39 KMAV.



IAEA GC63 Side Events, 17-18 Sept 2019

- **Nuclear Operator's Forum: Challenges and Solutions for the Sustainable management of the Nuclear Supply Chain**
- IAEA Support to **Environmental Remediation Projects**
- Preparing the Next Generation of the **Workforce** for the Nuclear Industry: The Journey from Graduate to Employee
- Options to Manage **Spent Fuel from Research Reactors**
- **Reactor Technology Advances** to Support Integration of Renewable Energy Systems and Nuclear Installations

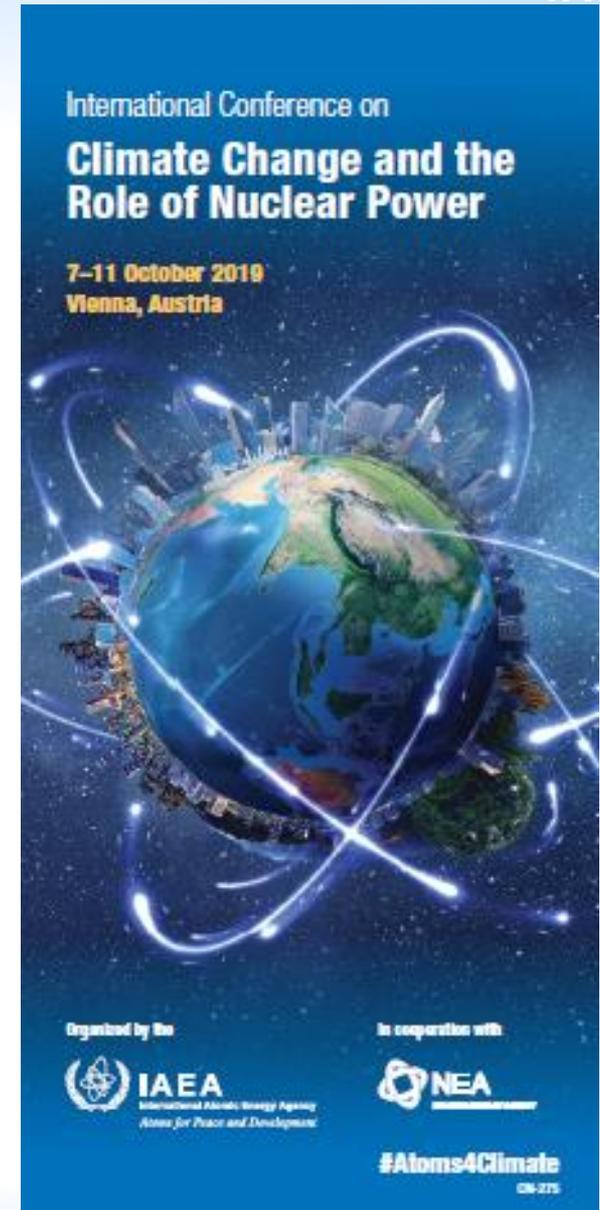


IAEA International Conference on Climate Change

To provide a forum for the exchange
of information on

- **role of nuclear power**
- **opportunities and challenges**
of safe, secure and safeguarded
nuclear technology development

in supporting the low-carbon energy
transformation needed to achieve the
climate change goals



Research Reactor Conference

- Objective: To foster exchange of information on operating and planned research reactors
 - Operators, managers, users, regulators, designers and suppliers
- Topics
 - Utilization and applications
 - Operation and maintenance
 - New research reactor programmes
 - Safety
 - Security
 - Fuel management and decommissioning
 - Common management considerations

International Conference on
Research Reactors:
Addressing Challenges and Opportunities to
Ensure Effectiveness and Sustainability

25–29 November 2019, Buenos Aires, Argentina



Organized by the



IAEA
International Atomic Energy Agency



Hosted by the Government of Argentina
through the
National Atomic Energy Commission (CNEA)

CN-277

2021 Ministerial Conference on Nuclear Power

- Strong messages from 2017 Conference in Abu Dhabi
- Benefitted from participation of NEA DG and DDG, coordination with NEA staff on organization of panel discussions, conference documents
- IAEA looks forward to similar engagement of NEA in preparation for 2021 Conference





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Thank you!

