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# **IAEA Support to Countries Embarking and Expanding Their Nuclear Power Programmes**

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**18<sup>th</sup> INPRO Dialogue Forum**

# Content



- Historical Perspective
- Current Programme
- Trends for the coming years



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# Historical Perspective

# Early 2000's



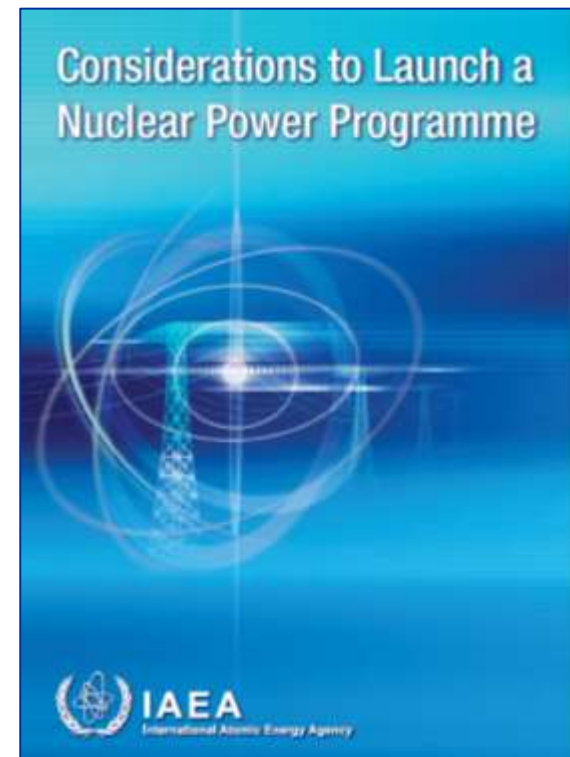
- Most IAEA activities in the area of nuclear power were oriented to countries operating nuclear power plants
  - Support to Regulatory Bodies
  - Support to Operating Organizations

*Focus of guidance documents, capacity building activities and peer review services on improving the existing arrangements*

# Early 2000's

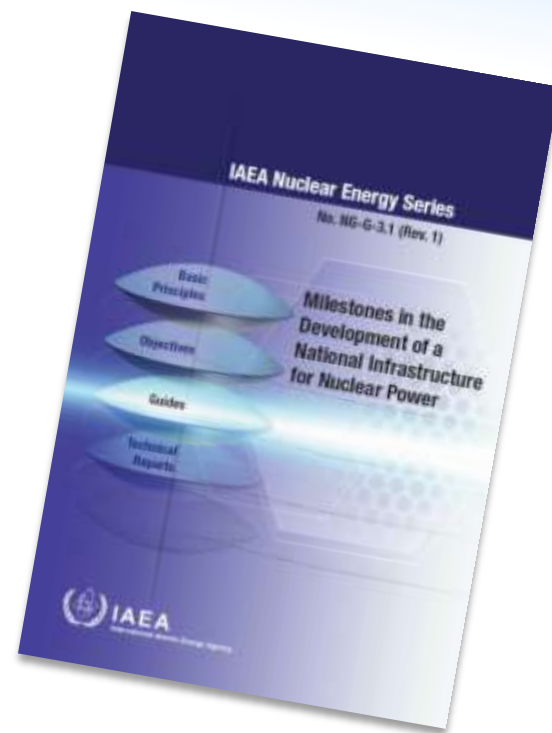
- During the GC and in other fora, several countries expressed interest in developing new nuclear power programmes:
  1. Embarking countries  
(countries intending to build their first nuclear power plant)
  2. Expanding Countries  
(countries already operating NPPs but without new constructions for a long time)

## 2007 - IAEA Brochure



# Period 2007-2010

- Milestones approach issued
  - 3 Phased approach
  - Integrates 19 topics



*Infrastructure development group* was created in 2010 (became NIDS in 2014) with the purpose of strengthening the coordination and harmonization of the Agency's efforts related to the integration of nuclear power



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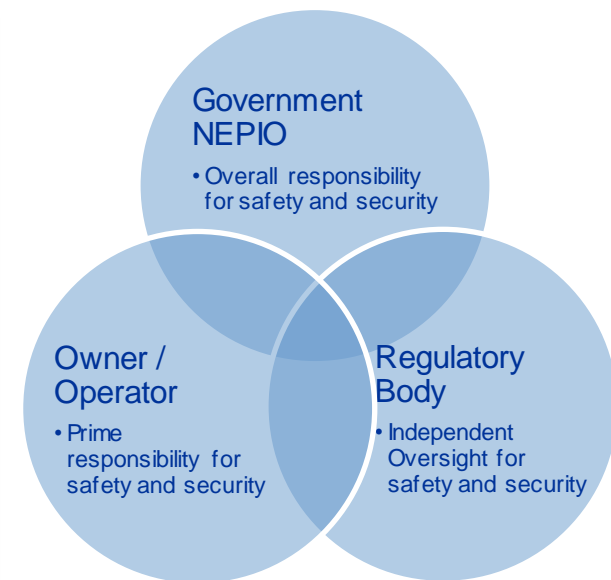
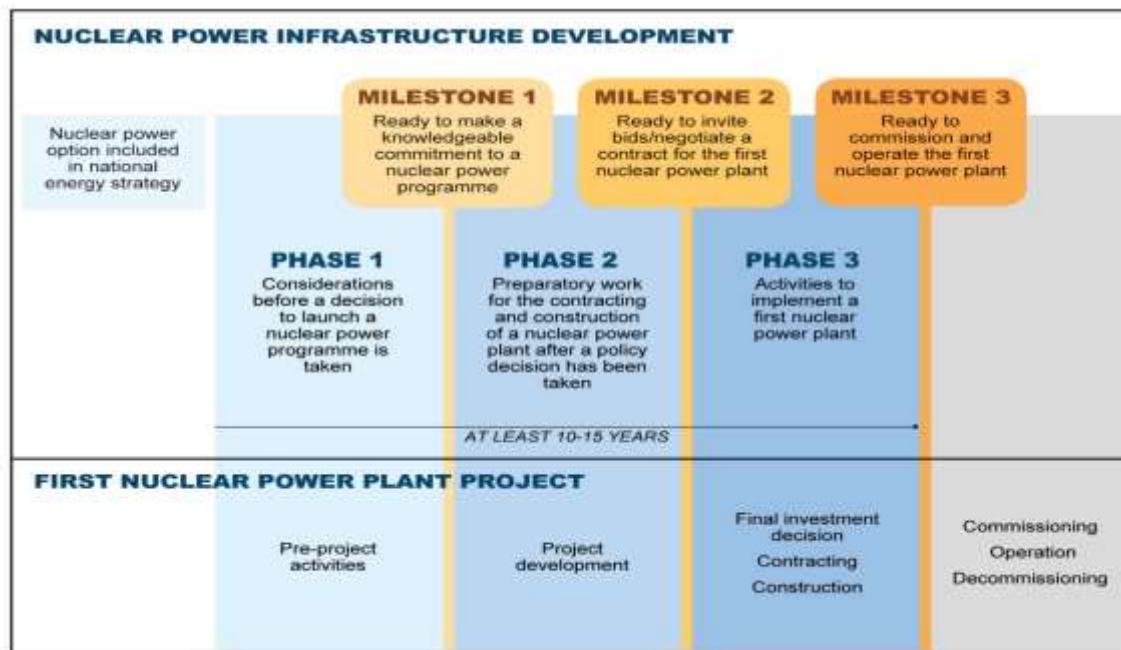
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# CURRENT PROGRAMME

# IAEA Major Programme 1: Nuclear Power



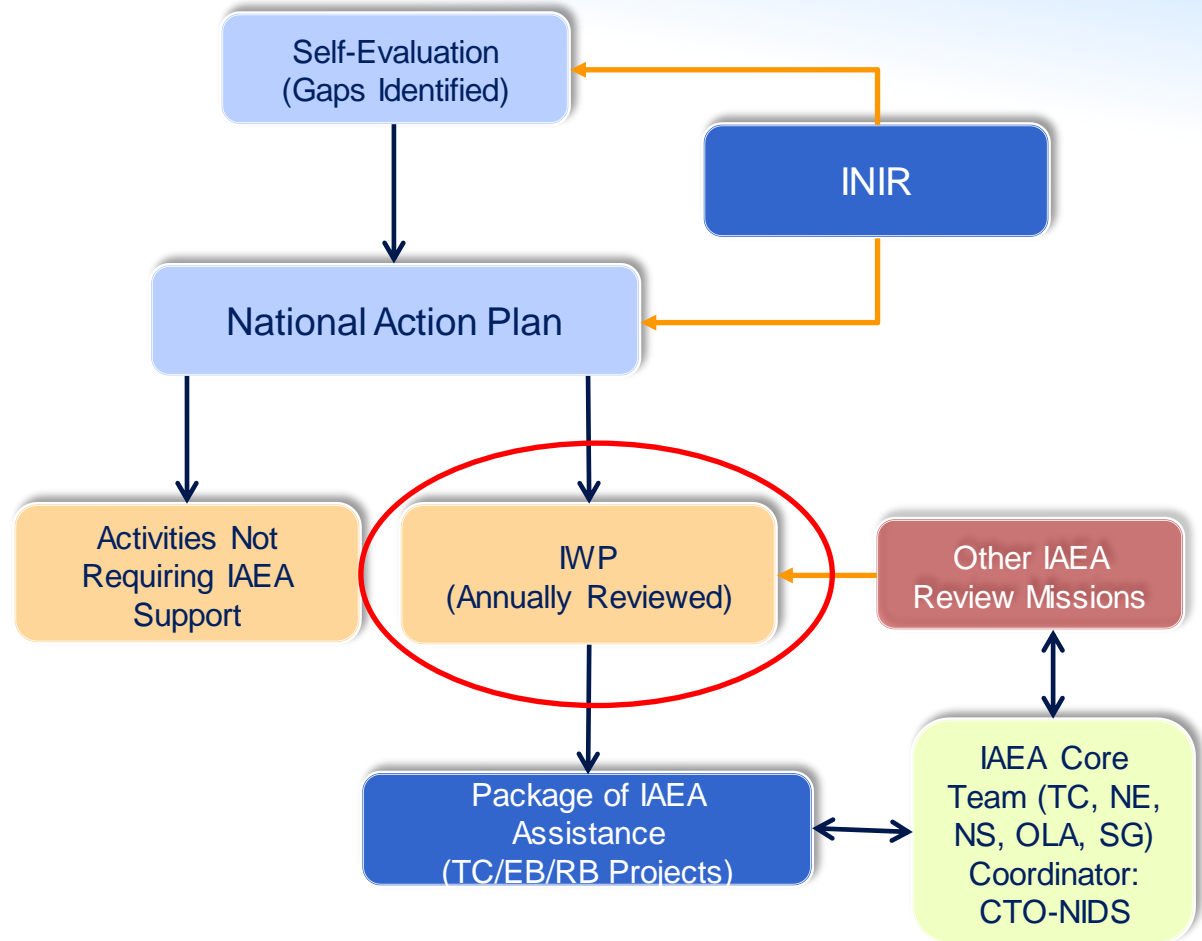
- Sub-programme 1.1.3: Infrastructure and Planning for New Nuclear Power Programmes



*Axes of Sub-Programme 1.1.3: (1) Provide Integrated Support, (2) Implement Peer Reviews, (3) Develop guidance materials, (4) Support Capacity Building*



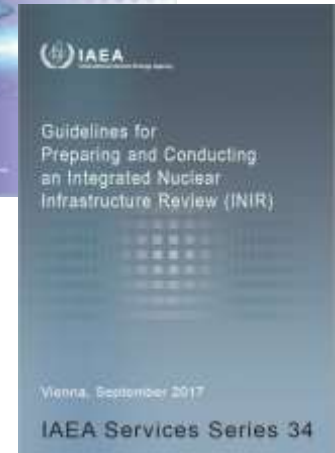
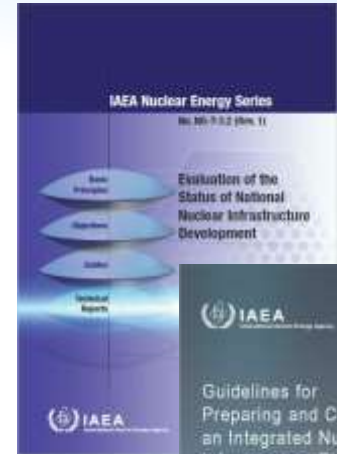
# Provide Integrated Support



# Peer Review Services

## Integrated Nuclear Infrastructure Review (INIR)

- Objective is to assist the Member State in determining the status of its nuclear power infrastructure development.
- It evaluates the status of the infrastructure, identifies gaps, provides recommendations and suggestions to the host Member State.
- Requested by Member State government with results delivered to government (and decision-makers).



# Integrated Nuclear Infrastructure Review Missions 2009-2020

1. Jordan (Phase 1)	2009
2. Indonesia (Phase 1)	2009
3. Viet Nam (Phase 1)	2009
4. Thailand (Phase 1)	2010
5. UAE (Phase 2)	2011
6. Bangladesh (Phase 1&2)	2011
7. Jordan follow-up	2012
8. Belarus (Phase 1&2)	2012
9. Viet Nam (Phase 2)	2012
10. Poland (Phase 1)	2013
11. South Africa (Phase 2)	2013
12. Turkey (Phase 2)	2013
13. Jordan (Phase 2)	2014
14. Viet Nam follow-up	2014
15. Nigeria (Phase 2)	2015
16. Kenya (Phase 1)	2015
17. Morocco (Phase 1)	2015
18. Bangladesh follow-up	2016
19. Poland follow-up	2016
20. Kazakhstan (Phase 1)	2016
21. Malaysia (Phase 1)	2016
22. Ghana (Phase 1)	2017
23. Niger (Phase 1)	2018
24. UAE (Phase 3)	2018
25. Saudi Arabia (Phase 2)	2018
26. Sudan (Phase 1)	2018
27. Philippines (Phase 1)	2018
28. Ghana follow-up	2019
29. Egypt (Phase 2)	2019
30. Belarus (Phase 3)	2020

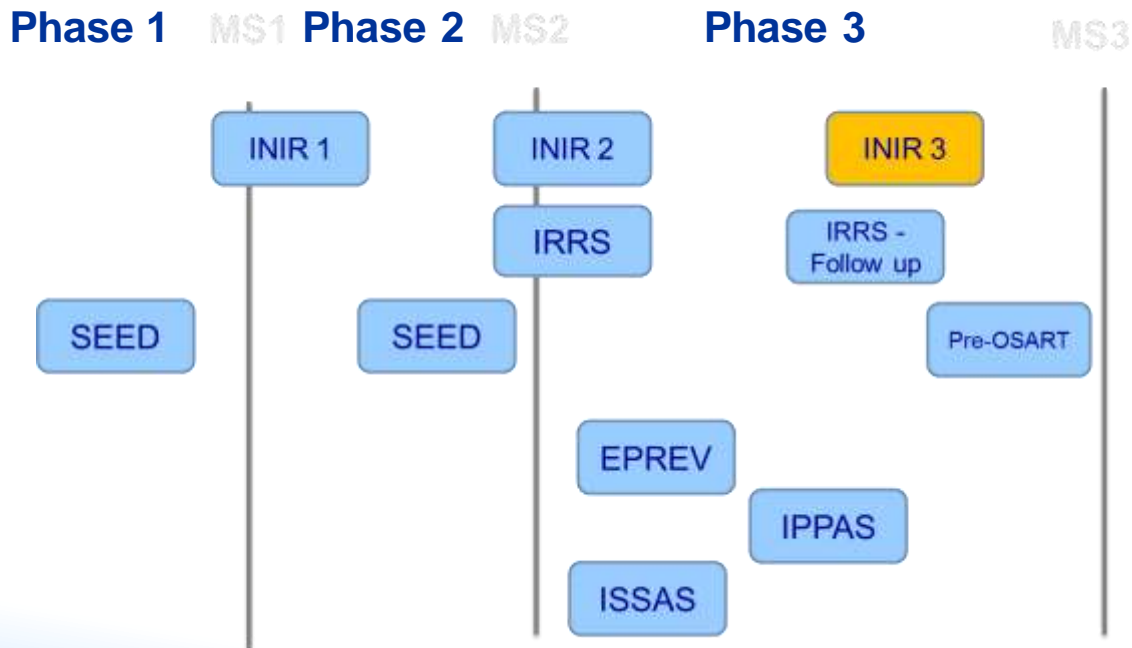


4 planned in 2021

Uzbekistan Phase 2, Sri Lanka Phase 1,  
Kenya Phase 1 Follow-Up, Uganda Phase 1

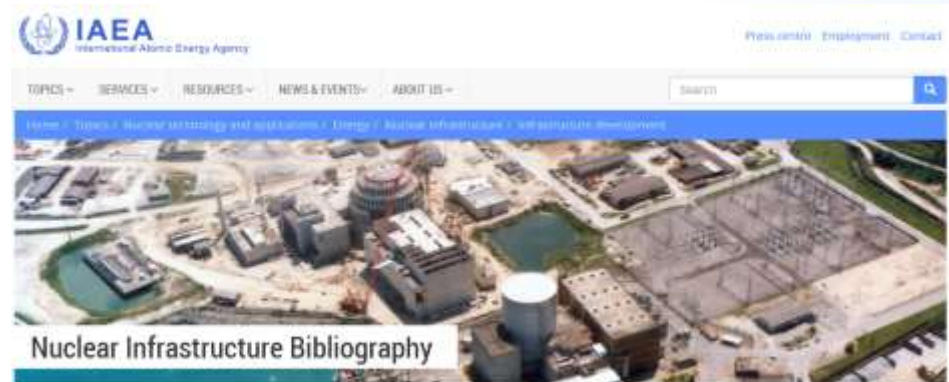
# Peer Review Services

- IAEA Nuclear Safety Action Plan approved by the General Conference in September 2011, recommends that MSs ensure readiness of the nuclear infrastructure before commissioning and operating a NPP. MSs are encouraged to request INIR and other review missions



# Development of Guidance Materials

- Nuclear Infrastructure Bibliography



**Infrastructure development**

- Milestones Approach
- Nuclear Infrastructure Bibliography
- E-learning for Nuclear Newcomers

The IAEA guidance publication *Milestones in the Development of a National Infrastructure for Nuclear Power* outlines 19 infrastructure issues that need to be addressed in developing a new nuclear power programme. This bibliography is categorised according to these issues, listed below.

Click on any of the topics below to see the list of relevant IAEA publications. Further technical publications can be found on [IAEA Publications](#).

1. National Position	10. Human Resource Development
2. Nuclear Safety	11. Stakeholder Involvement
3. Management	12. Site and Supporting Facilities
4. Funding and Financing	13. Environmental Protection
5. Legal Framework	14. Emergency Planning
6. Safeguards	15. Nuclear Security
7. Regulatory Framework	16. Nuclear Fuel Cycle
8. Radiation Protection	17. Radioactive Waste Management
9. Electrical Grid	18. Industrial Involvement
	19. Procurement

**Related Resources**

- IAEA Milestones Approach: Developing the National Infrastructure for Nuclear Power (Brochure)
- IAEA Milestones Approach: Developing the National Infrastructure for Nuclear Power (Video)
- IAEA Scientific and Technical Publications
- Nuclear Infrastructure Development Session
- Department of Nuclear Energy
- Department of Nuclear Safety and Security

<https://www.iaea.org/topics/infrastructure-development/bibliography>



# Capacity Building (1)

- **E-Learning Modules**



- Infrastructure development
- Milestones Approach
- Nuclear Infrastructure Bibliography
- E-learning for Nuclear Newcomers

This IAEA interactive series of e-learning modules covers various aspects of developing a safe, secure and sustainable nuclear power programme.

The modules explain the IAEA Milestones Approach, a phased comprehensive method that covers 19 nuclear infrastructure issues to help countries that are considering or planning their first nuclear power plant understand the commitments and obligations associated with a nuclear power programme. The modules are also appropriate for countries expanding an existing nuclear power programme.




- Introduction and overview
- National position
- Safety infrastructure
- Culture for Safety
- Feasibility study
- NP programme management
- Management systems
- Construction management
- Legal framework
- Safeguards
- Human resource development
- Systematic approach to training
- Stakeholder involvement
- Siting
- Emergency Preparedness and Response
- Spent Fuel and Radioactive Waste Management
- Industrial Involvement
- Procurement

<https://www.iaea.org/topics/infrastructure-development/e-learning-for-nuclear-newcomers>

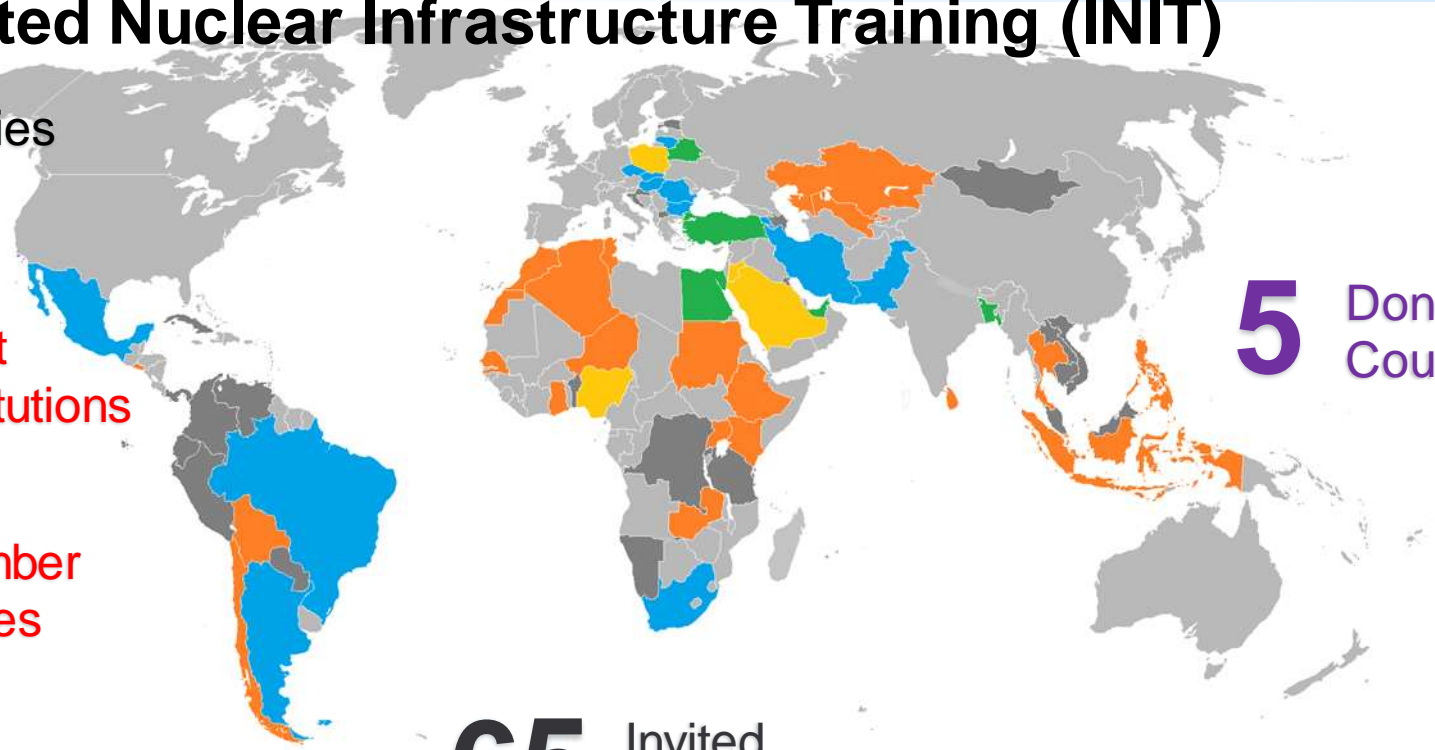
# Capacity Building (2)

## Integrated Nuclear Infrastructure Training (INIT)

25 Activities  
Per year

**17** Host  
Institutions  
in

**12** Member  
States



**5** Donors  
Countries

**65** Invited  
Member States → Driving the content

... implemented by 16 different Sections across 4 Departments and 1 Office.

TC		NE						NS					SG	OLA	
TCAP Section 1	TCEU Section 1	NENP NIDS	NENP NPES	NENP NPTDS	NEPK PESS	NEFW WTS	NEFW NFCMS	NSNI RAS	NSNI EESS	NSNI IEC	NSRW RSMS	NSNS MAFA	NSOC PSCS	SGCP SGTS	NPPMS

# Capacity Building (3)

## WEBINAR SERIES



Milestones Approach and Key Organisations involved in the nuclear power programme development



Responsibilities and Functions of a NEPIO



Responsibilities and Capabilities of Owners and Operators of NPPs



Experience of Member States in Building a Regulatory Framework for the Oversight of NPPs

## Newcomers success stories



**United Arab Emirates**

April 2021





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# TRENDS FOR THE COMING YEARS

- Revision of the Milestones approach and other support documents
  - Include references to SMRs when appropriate
  - Cover more broadly non-electrical applications
- Reinforce support to more advanced embarking countries (Phase 3 and expanding)
- Expand e-tools (e-books, e-learning modules)



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*Thank you!*

