IAEA 60 Years
Atoms for Peace and Development

10 Years IAEA programme for emerging nuclear nations

The Milestones Approach in Nuclear Power Infrastructure Development

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IAEA and Newcomer Countries

"It is each country's sovereign decision whether to add nuclear power to its energy mix"

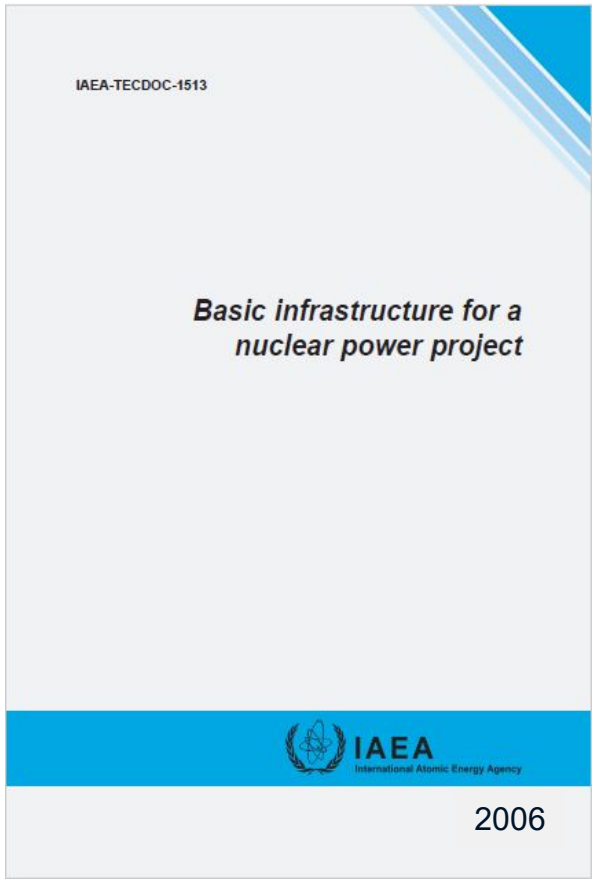
"The Agency has a key role to play in ensuring that expansion in nuclear power takes *place in an efficient, responsible and sustainable manner."*

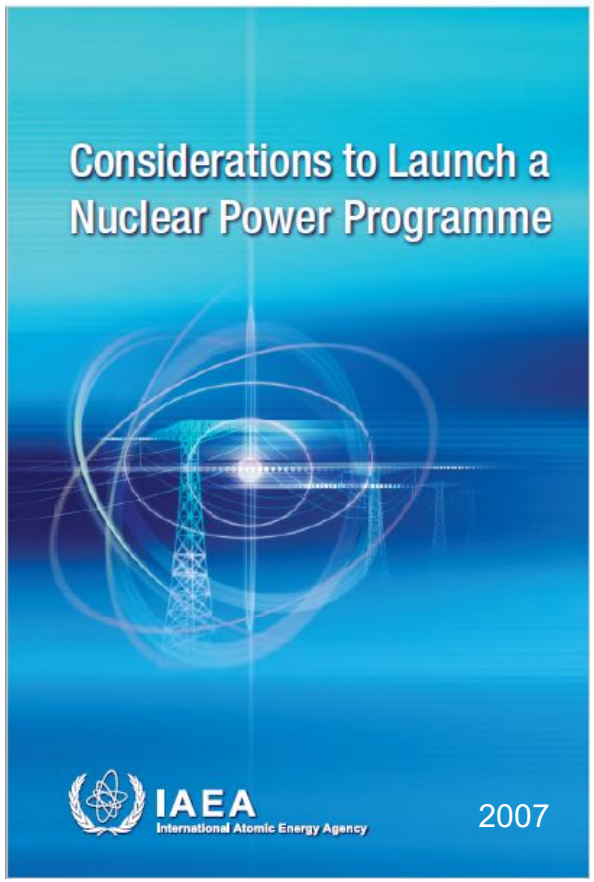
"*Assistance to newcomers, especially those which are most advanced on the road to having operational reactors, will remain a high-priority issue."*

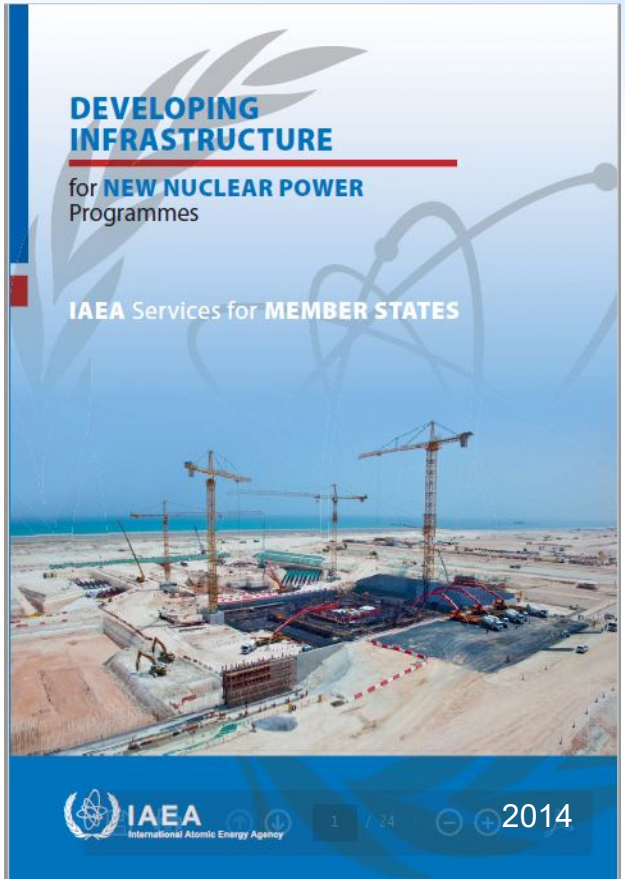
Yukiya Amano

IAEA Director General

2000s: Renewed Interest in NPPs

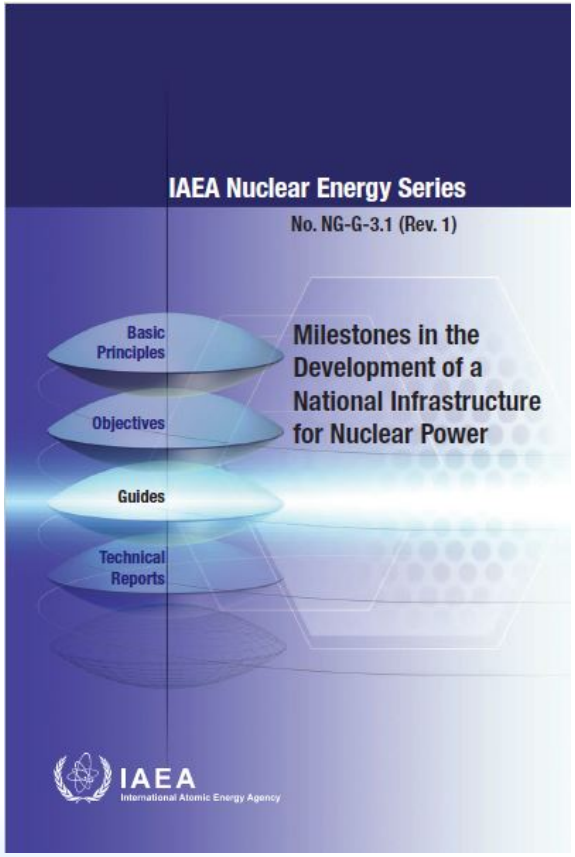




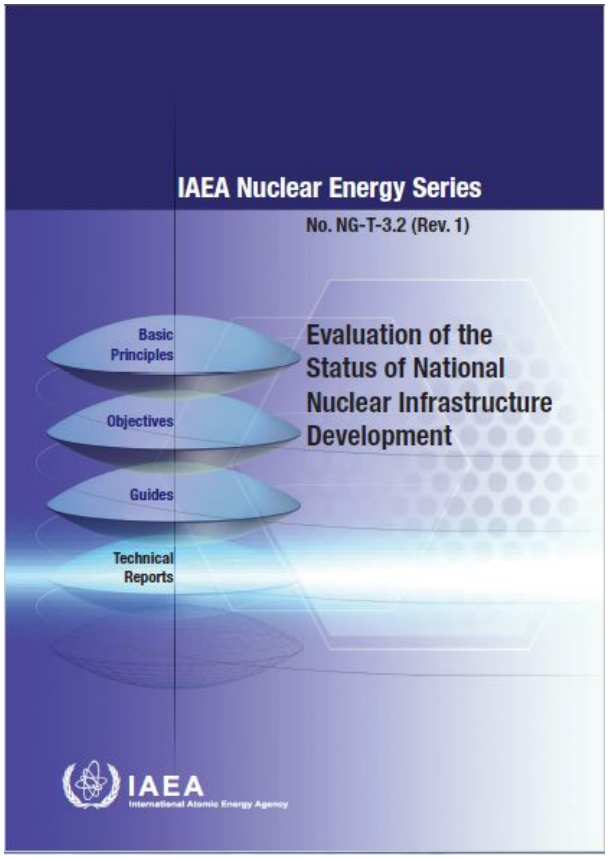


2007-2017: The INIR Service

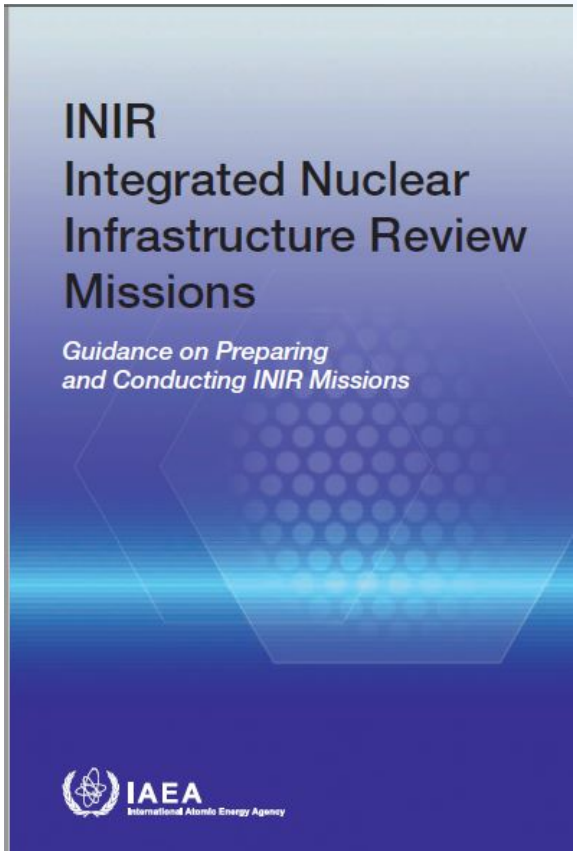
2007, 2015(Rev.1)



2008, 2016(Rev.1)

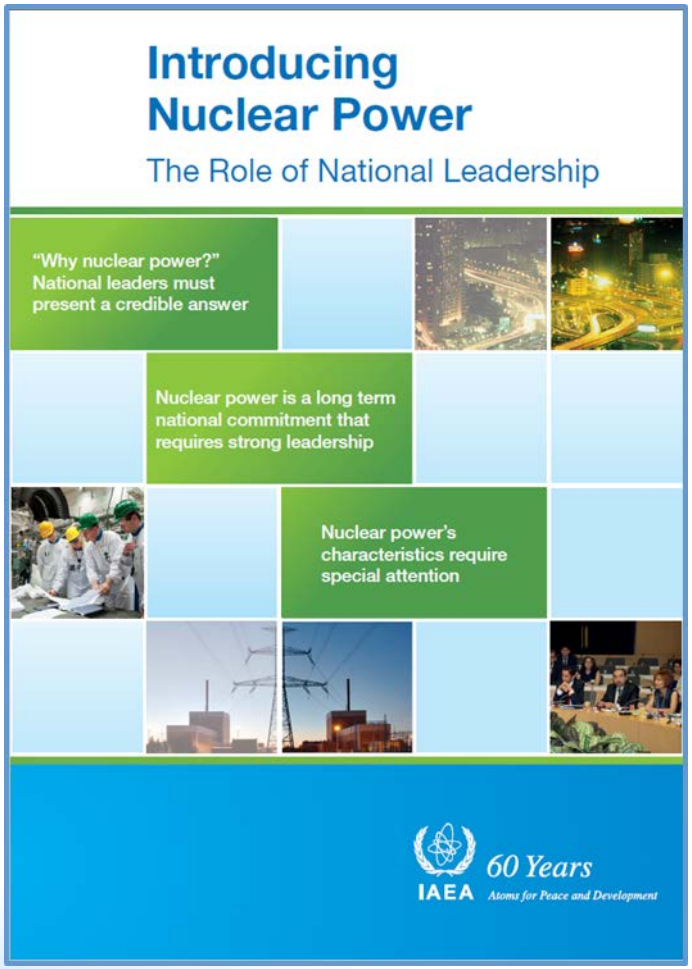


2009, 2011(Rev.1), 2017(Rev.2)



2011-2017: 3S & Infrastructure

Considerations for Nuclear Power

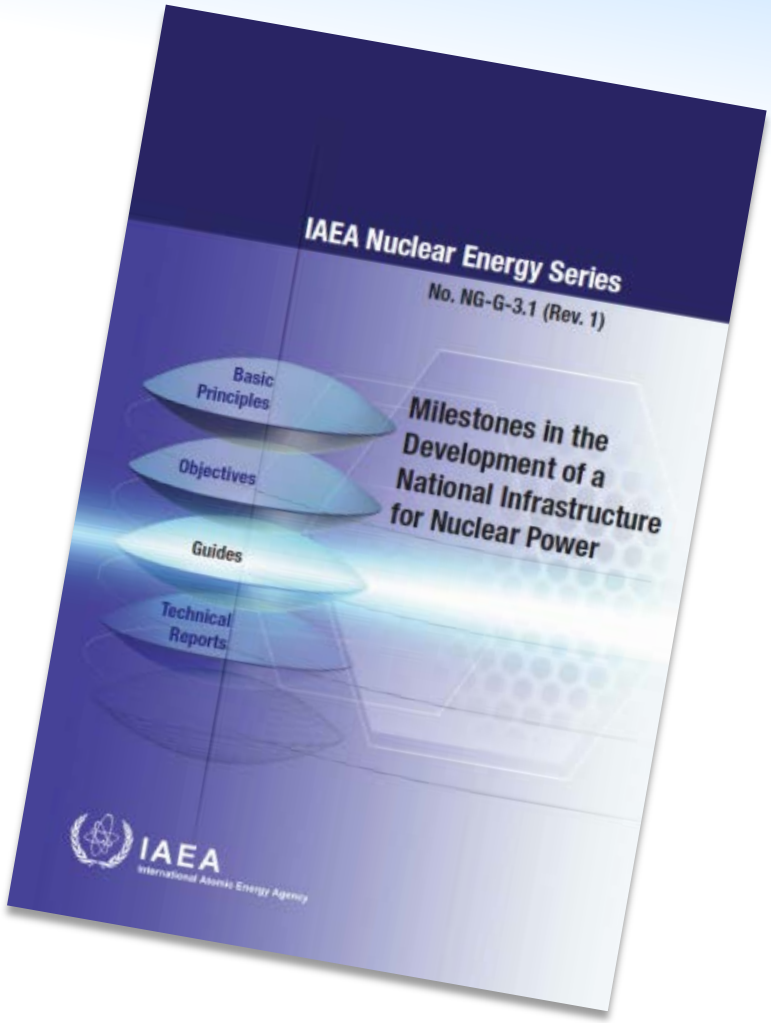


- ✓ Nuclear power is a long term commitment that requires strong national leadership
- ✓ A successful nuclear power programme requires commitment of at least 100 years.
- ✓ Creating the infrastructure and building the first nuclear power plant will take at least 10–15 years.
- ✓ The leadership should ensure coordination and broad political and popular support.
- ✓ The highest standards of safety, security and safeguards must be applied.
- ✓ The penalties of interruptions and restarts are significant.

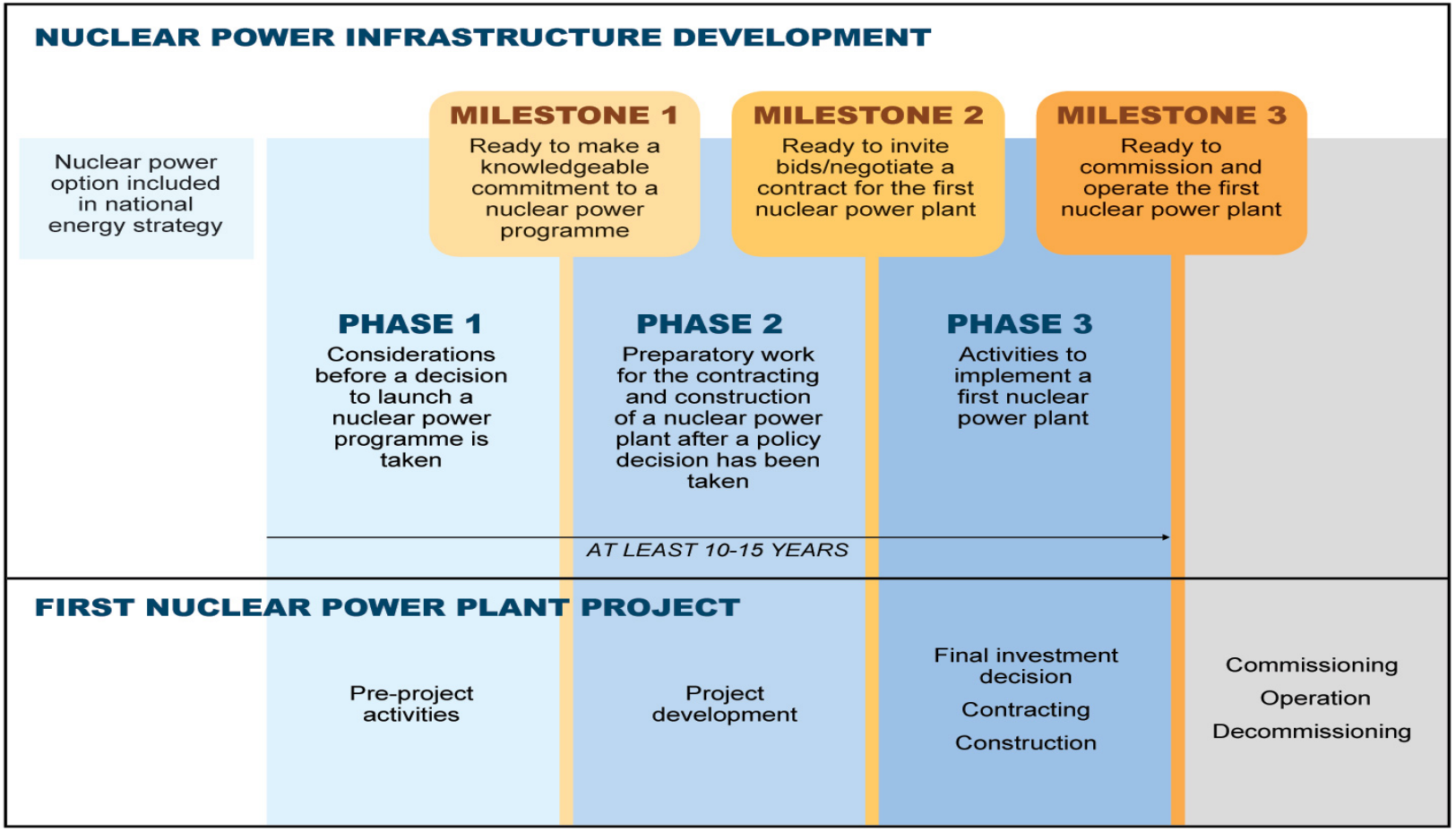
The IAEA Milestones Approach for Nuclear Power Infrastructure Development

- Phased
- Comprehensive
- Integrated

The Milestones Approach is holistic and considers
19 specific infrastructure issues
Issued in 2007; Updated in 2015



Milestones in the Development of a National Infrastructure for Nuclear Power



Phase 1: Building the National position

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Prefeasibility study

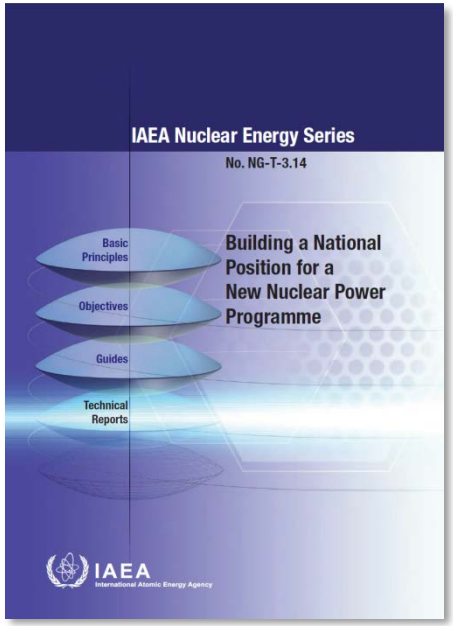
- Reviews required infrastructure and feasibility for nuclear power program

Comprehensive report

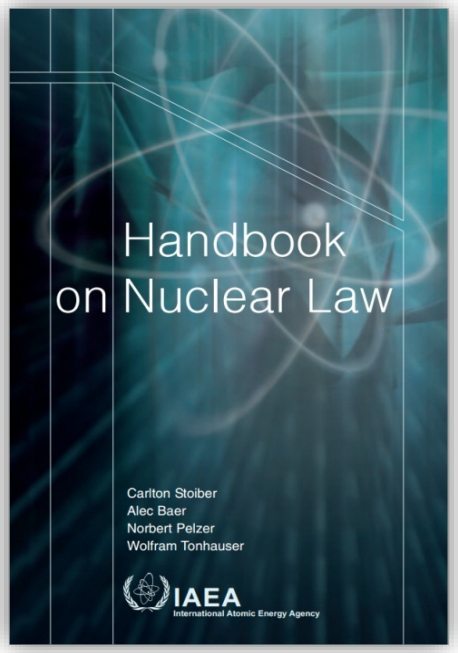
- Comprehensive examination of all 19 infrastructure issues

National Strategy

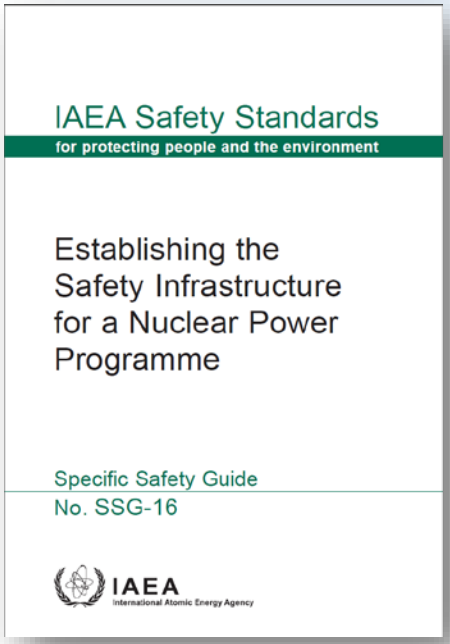
- Should the Comprehensive report recommend positive National decision, national strategy is defined



Phase 2: Building institutions the RB



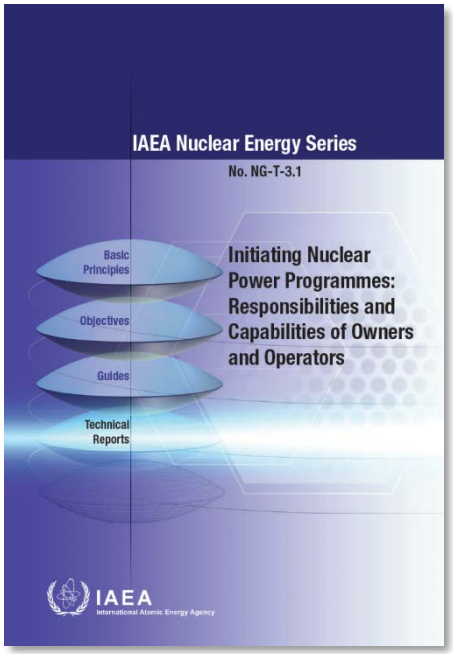
The Legal Framework is the foundation of the nuclear power programme



Regulatory body

- ✓ **Strong**
- ✓ **Independent**
- ✓ **Competent**

Phase 2: Building institutions the O/O



Updated! – to be published in 2017

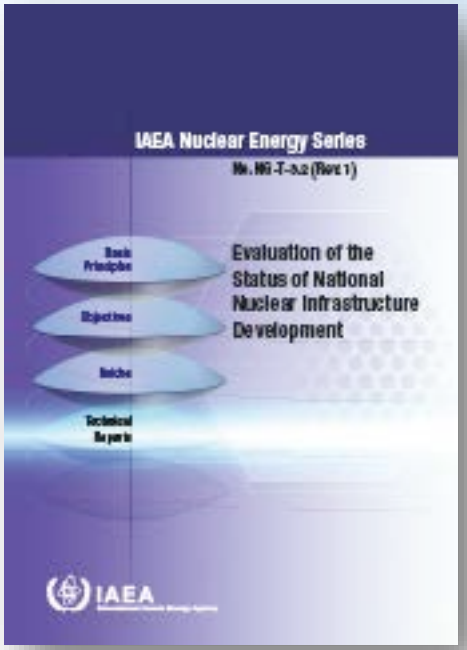
Country	Owner/Operator
Bangladesh	BAEC/ NPB Ltd (enacted law)
Belarus	Directorate for NPP Construction under the Ministry of Energy
Egypt	NPPA
Jordan	JAEC/JNPC
Nigeria	No decision
Poland	PGE
Saudi Arabia	KA CARE/ TBD
Turkey	APC/EUAS +
UAE	ENEC/NAWAH

Integrated Nuclear Infrastructure Reviews (INIR)

- Based on the Milestones Approach:
  19 Infrastructure Issues
  3 Phases, 3 Milestones
- International expert peer review led by a high level IAEA manager
- Identifies areas for further action and makes suggestions and recommendations
- Requested by Member State government - results are delivered to government (and decision-makers)

Evaluation Methodology (NG-T-3.2 (Rev.1)) published

- INIR missions are conducted based on a transparent, publicly available evaluation methodology.
- This methodology also support the development of Self-Evaluation Reports
- INIR Phase 3 methodology was separately developed.



The revision was published in 2016 including:

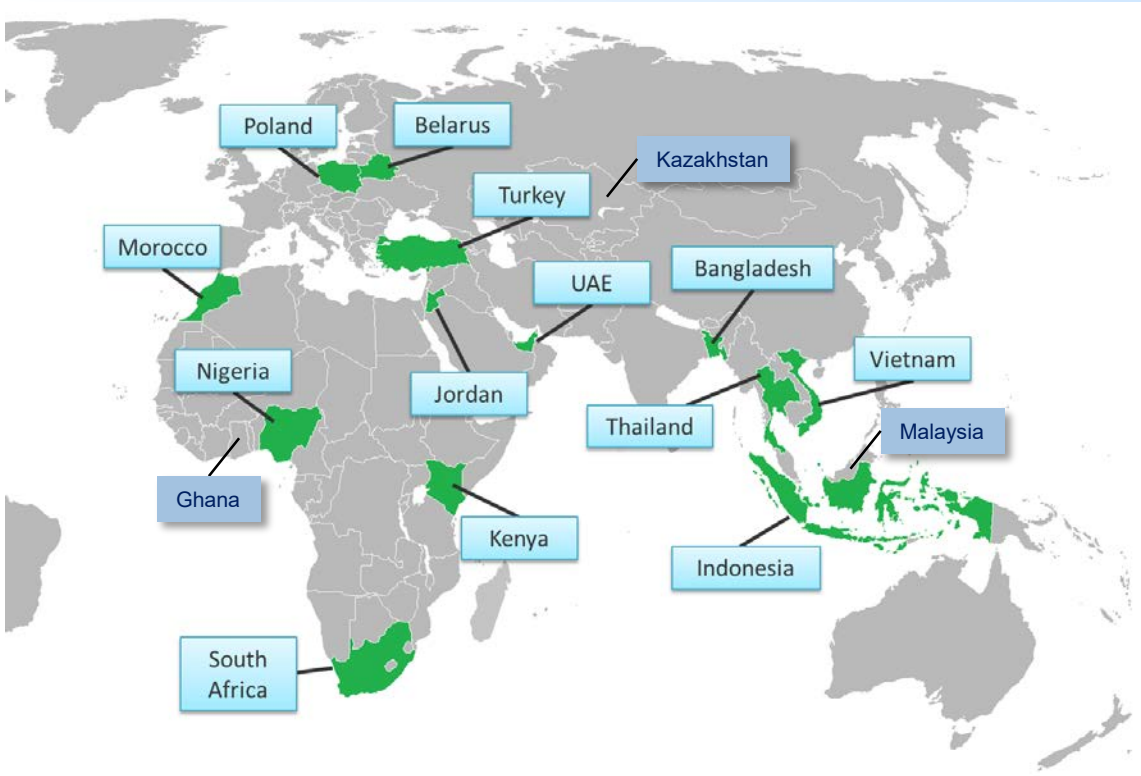
- Modifications due to the revision of the Milestones document, and experience gained during INIR missions
- Consideration of recently issued documents for embarking countries
- Reduction in the number of conditions to avoid overlapping

INIR process

- The integrated nuclear infrastructure review is comprised of the following **4 steps:**
  - Step 1: Self Evaluation Report (SER) review
  - Step 2: Pre-INIR mission
  - Step 3: INIR mission
  - Step 4: INIR Follow-up mission
- The INIR is conducted upon formal request from the Member State, and consists of all 4 steps
- The timing of each of the 4 steps is agreed with the Member State
- INIR Guidance publication update in 2017

INIR Missions 2009-2016

• Jordan	2009
• Indonesia	2009
• Vietnam	2009
• Thailand	2010
• UAE (Phase 2)	2011
• Bangladesh (Phase 1&2)	2011
• Jordan follow-up	2012
• Belarus (Phase 1&2)	2012
• Vietnam (Phase 2)	2012
• Poland	2013
• South Africa (Phase 2)	2013
• Turkey (Phase 2)	2013
• Jordan (Phase 2)	2014
• Vietnam follow-up	2014
• Nigeria (Phase 2)	2015
• Kenya	2015
• Morocco	2015
• Bangladesh follow-up	2016
• Poland follow-up	2016
• Kazakhstan (Phase 1) planned	2016
• Malaysia (phase 1) planned	2016
• Ghana (phase 1) planned	2017



2016 topical publications

Building a National Position for a New Nuclear Power Programme

NE Series NG-T-3.14; New publication (June 2016)

Industrial Involvement to Support a National Nuclear Power Programme

NE Series No. NG-T-3.4; New publication (Dec.2016)

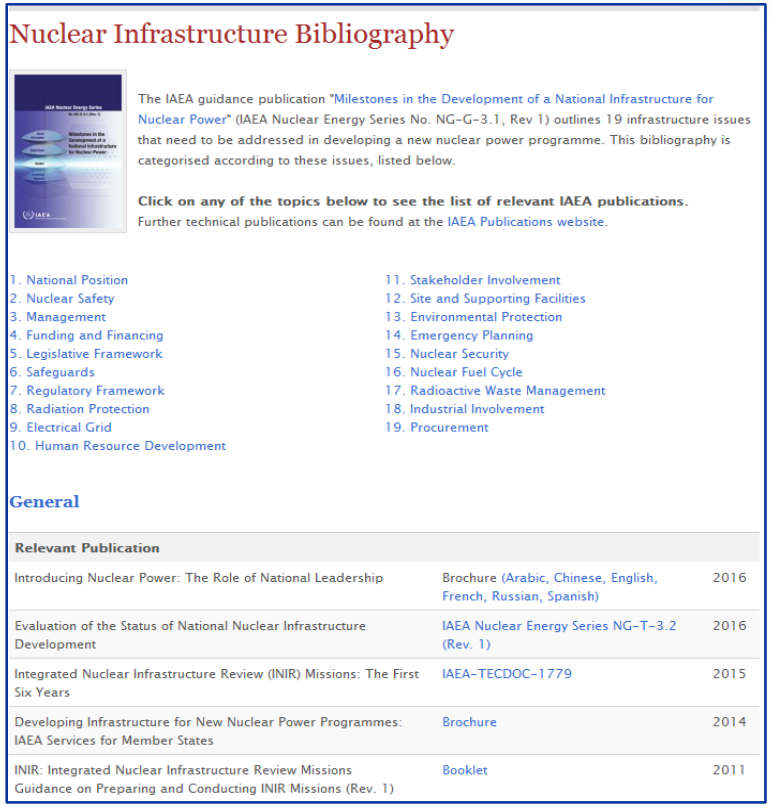
Responsibilities and Capabilities of a Nuclear Energy Programme Implementing Organization

NE Series NG-T-3.6 (2009); Publication in (2017)

Being updated to take into account the revision to the Milestone publication and experience gained in INIR missions. It includes case studies

Nuclear Infrastructure Bibliography

- Key and supporting documentation exists for the **19 Infrastructure Issues**



Nuclear Infrastructure Bibliography

The IAEA guidance publication "Milestones in the Development of a National Infrastructure for Nuclear Power" (IAEA Nuclear Energy Series No. NG-G-3.1, Rev 1) 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 at the IAEA Publications website.

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

General

Relevant Publication		
Introducing Nuclear Power: The Role of National Leadership	Brochure (Arabic, Chinese, English, French, Russian, Spanish)	2016
Evaluation of the Status of National Nuclear Infrastructure Development	IAEA Nuclear Energy Series NG-T-3.2 (Rev. 1)	2016
Integrated Nuclear Infrastructure Review (INIR) Missions: The First Six Years	IAEA-TECDOC-1779	2015
Developing Infrastructure for New Nuclear Power Programmes: IAEA Services for Member States	Brochure	2014
INIR: Integrated Nuclear Infrastructure Review Missions Guidance on Preparing and Conducting INIR Missions (Rev. 1)	Booklet	2011

https://www.iaea.org/NuclearPower/Infrastructure/Bibliography/index.html

E-Learning Modules

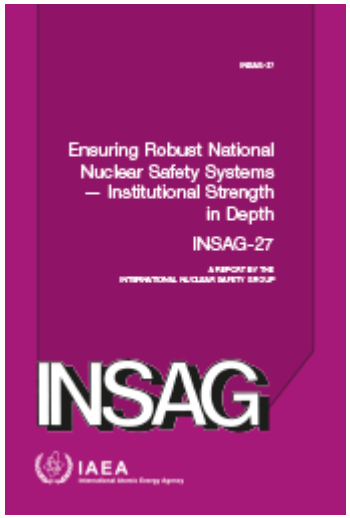
1. Introduction and overview
2. Human resource development
3. Stakeholder involvement
4. NP programme management
5. Construction management
6. Systematic approach to training
7. Feasibility study
8. Management systems
9. Safety infrastructure
10. Emergency preparedness and Response
11. Safeguards
12. Spent Fuel and Radioactive Waste Management
13. Siting
14. Legal framework – coming soon
15. National position
16. Culture for Safety
17. Procurement

INSAG 27

STRENGTH OF THE OVERALL NUCLEAR SAFETY SYSTEM
While the nuclear industry and regulator are responsible for their own parts of the system, the responsibility for the overall system is that of the government.
…….the only mechanisms at present that can look across the totality of the system are the:

- IAEA Integrated Nuclear Infrastructure Review service
- Review meetings of the Convention on Nuclear Safety
- Review meetings of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

These international mechanisms should provide a review of national nuclear safety systems to ensure the existence of robust Institutional Strength in Depth (ISiD).



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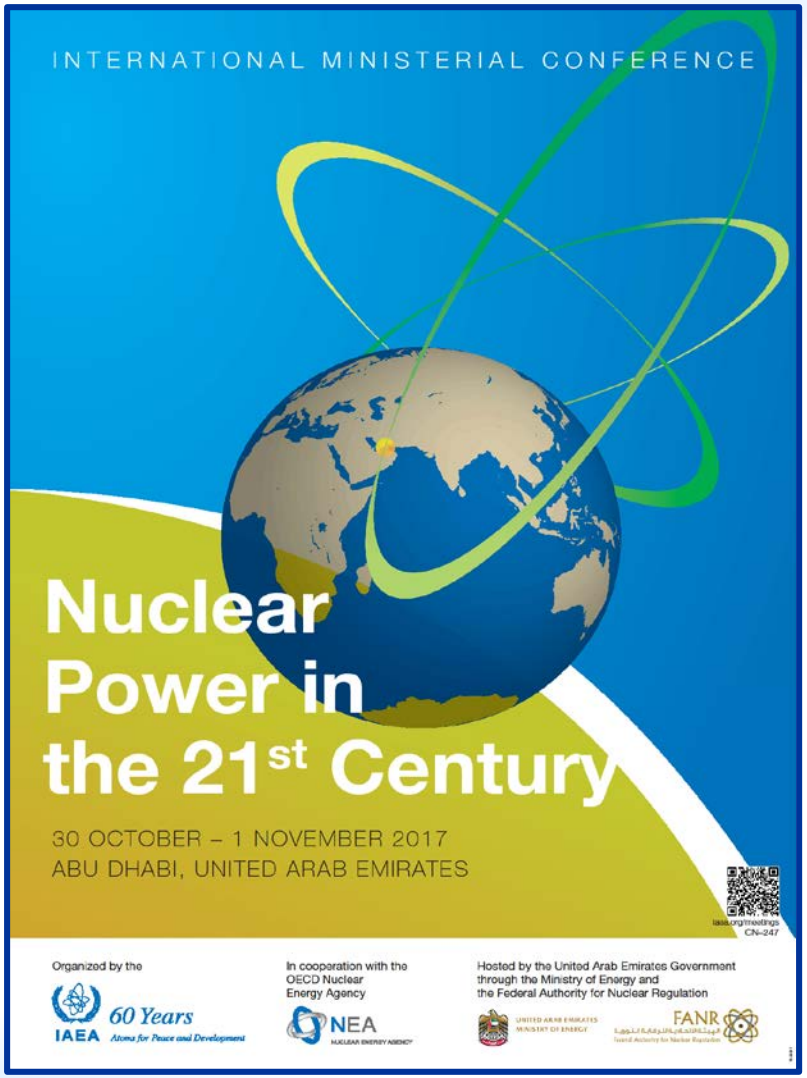
Atoms for Peace and Development

Thank you!

Ministerial Conference
"Nuclear Power in the 21st Century"



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