



The Abdus Salam
**International Centre
for Theoretical Physics**



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Joint ICTP-IAEA School on Nuclear Energy Management

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Role of the Owner/Future Operator

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ROLE OF THE NPP OWNER/OPERATOR

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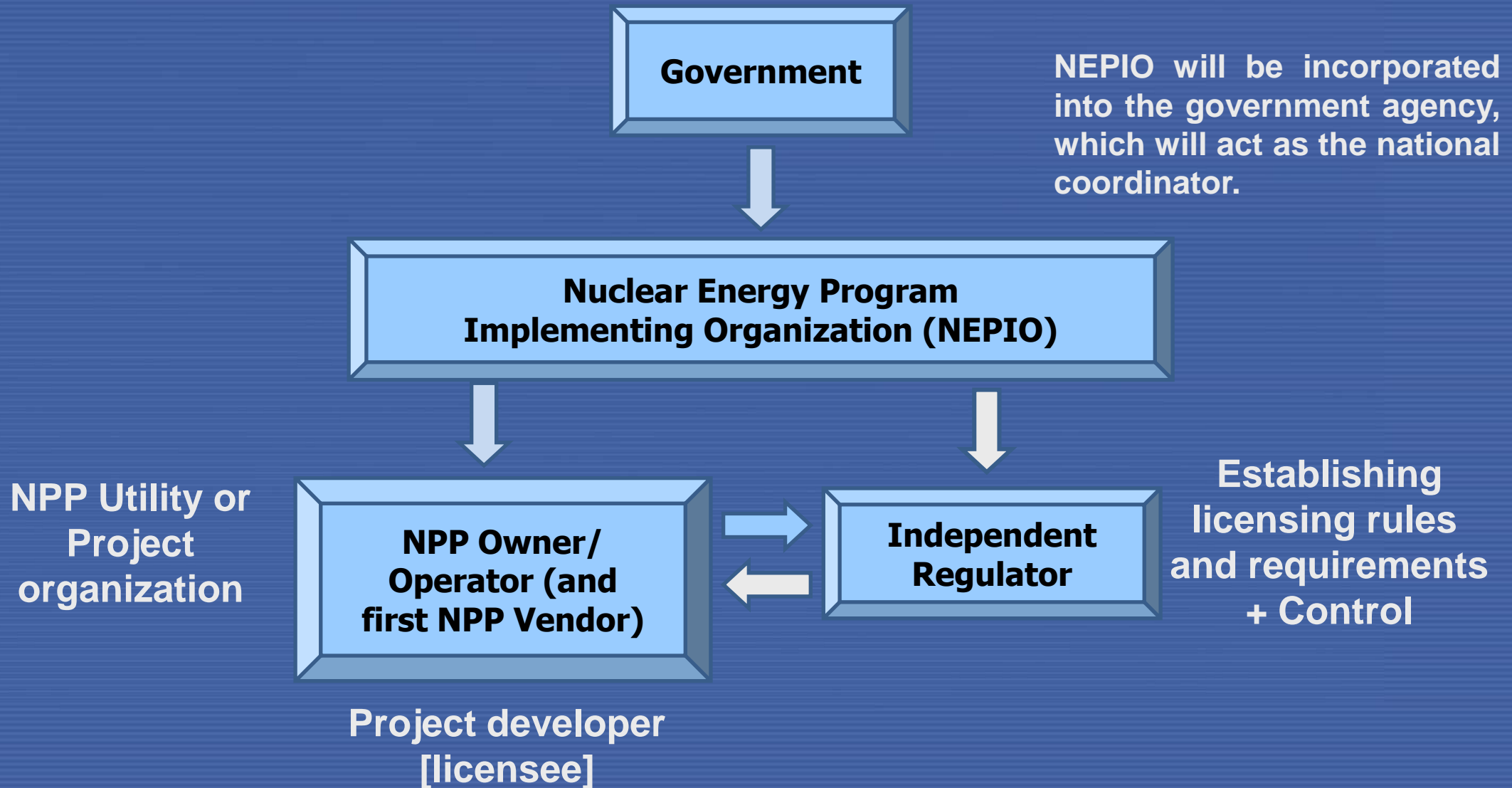
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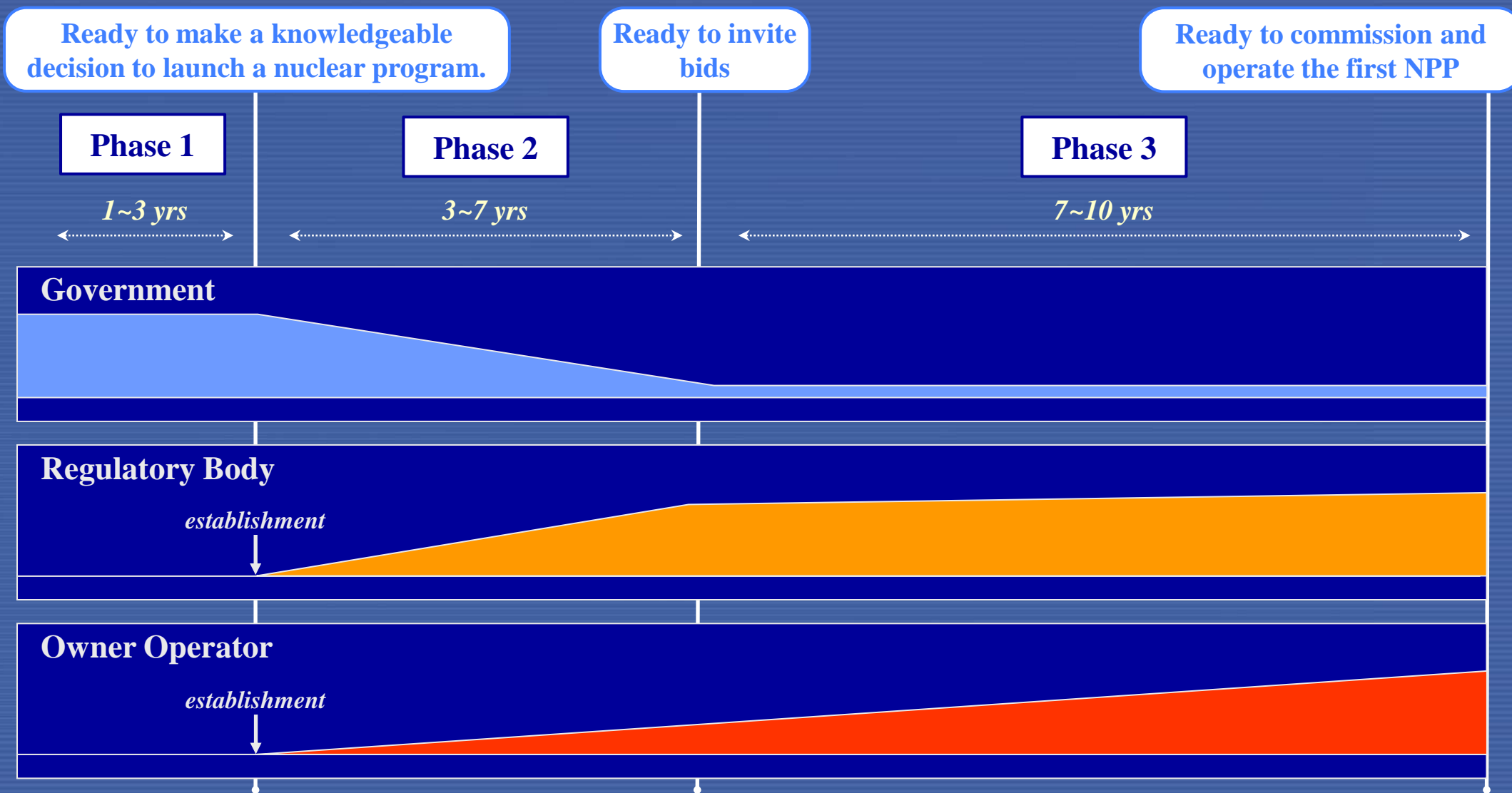
IAEA

International Atomic Energy Agency

MAIN PLAYERS IN NUCLEAR POWER



MILESTONES AND INVOLVED ORGANIZATIONS



WHO IS NPP OWNER/OPERATOR ? (1)

- NPP Owner/Operator is a national organization being a key player in a National Nuclear Power Program.
- NPP Owner responsibilities for the first NPP will include:
 - ✓ bidding,
 - ✓ construction,
 - ✓ licensing,
 - ✓ commissioning,
 - ✓ Operation & Maintenance,
 - ✓ life management
 - ✓ final decommissioning.

WHO IS NPP OWNER/OPERATOR ? (2)

- NPP Owner/Operator role and characteristics:
 - ✓ provides ownership and management of the NPP project;
 - ✓ must clearly understand **what** and **how** it has to act, **who** are its partners and supporters and the corresponding interactions that have to be established;
 - ✓ may be state-owned or a private company;
 - ✓ may be an existing utility or a specially established NPP Project organization.
- NPP Owner/Operator will have the ultimate responsibility to meet the safety, security and safeguards requirements at national and international levels.

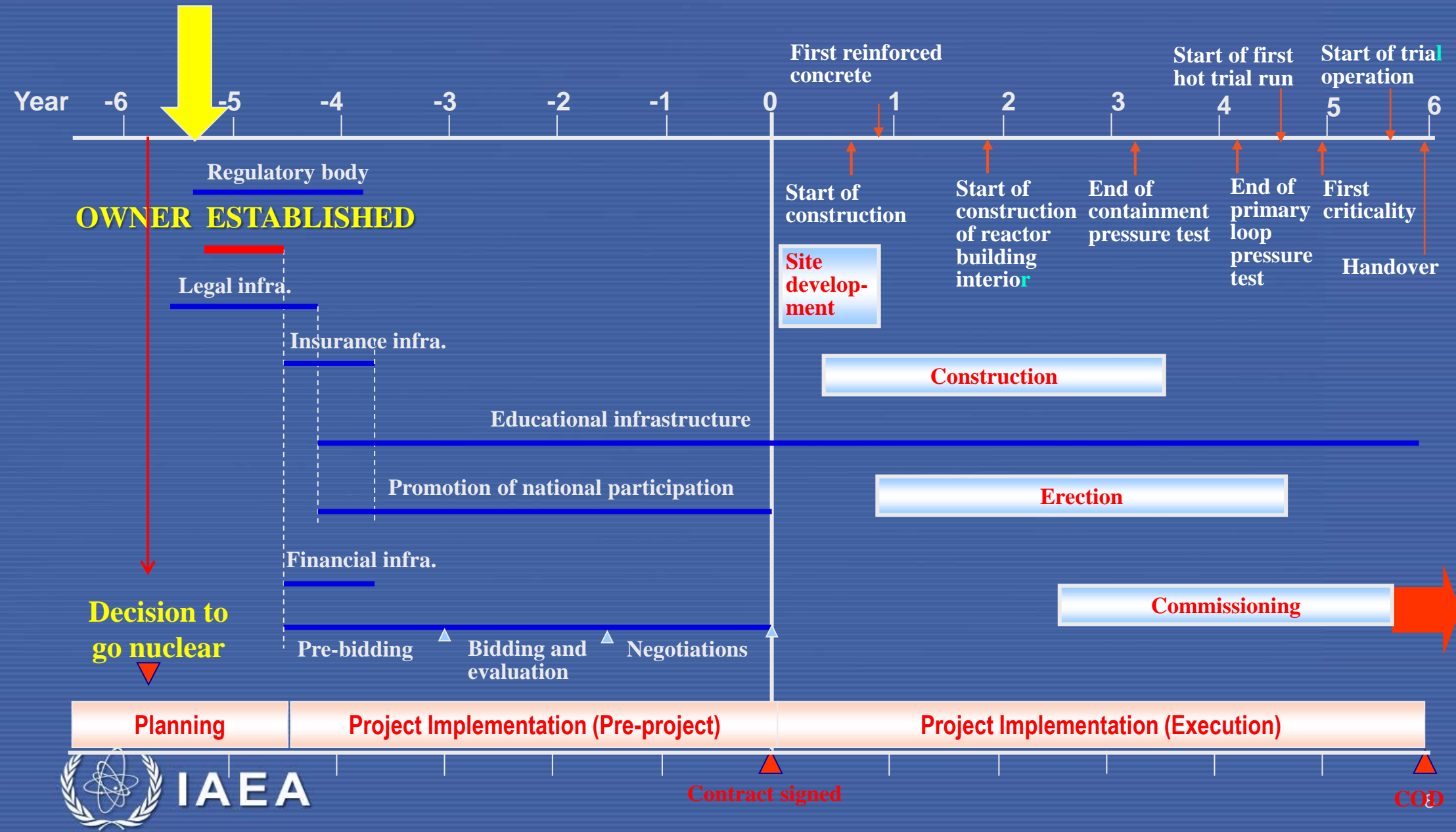
WHO IS NPP OWNER/OPERATOR ? (3)

- In some countries, the NPP Owner/Operator may not be a single organization (NPP Owner should sub-contract the operation).
- Division of responsibilities between the Owner and the Operator will depend on the particular arrangements in the country and may be dictated by the government (financing and funding reasons). However:
 - ✓ **“Operator”** has ultimately responsible for the safety of the NPP.
 - ✓ **“Owner”** is the organization recognized by the law as having the ultimate right to use the NPP and receive the profits from its operation. Usually it is responsible for financing and most other activities would be delegated to the Operator (by contract).

KNOWLEDGEABLE CUSTOMER DEFINITION

- ✓ **Knowledgeable customer:** an organization that has achieved the competence and capacity to effectively manage and execute its responsibilities, which include dialogue and interfaces with the safety authority, entering into and managing contractual and commercial relationships with suppliers, vendors, and other entities during the whole life cycle of the NPP.
- ✓ A **knowledgeable customer** knows **what to ask for**, **how to ask for it**, and **how to know** that it has received what it has asked for.
- ✓ Knowledgeable customer always introspects and questions the clients and make informed decisions.
- ✓ Creating knowledgeable customers in the field of nuclear power is a complex process.

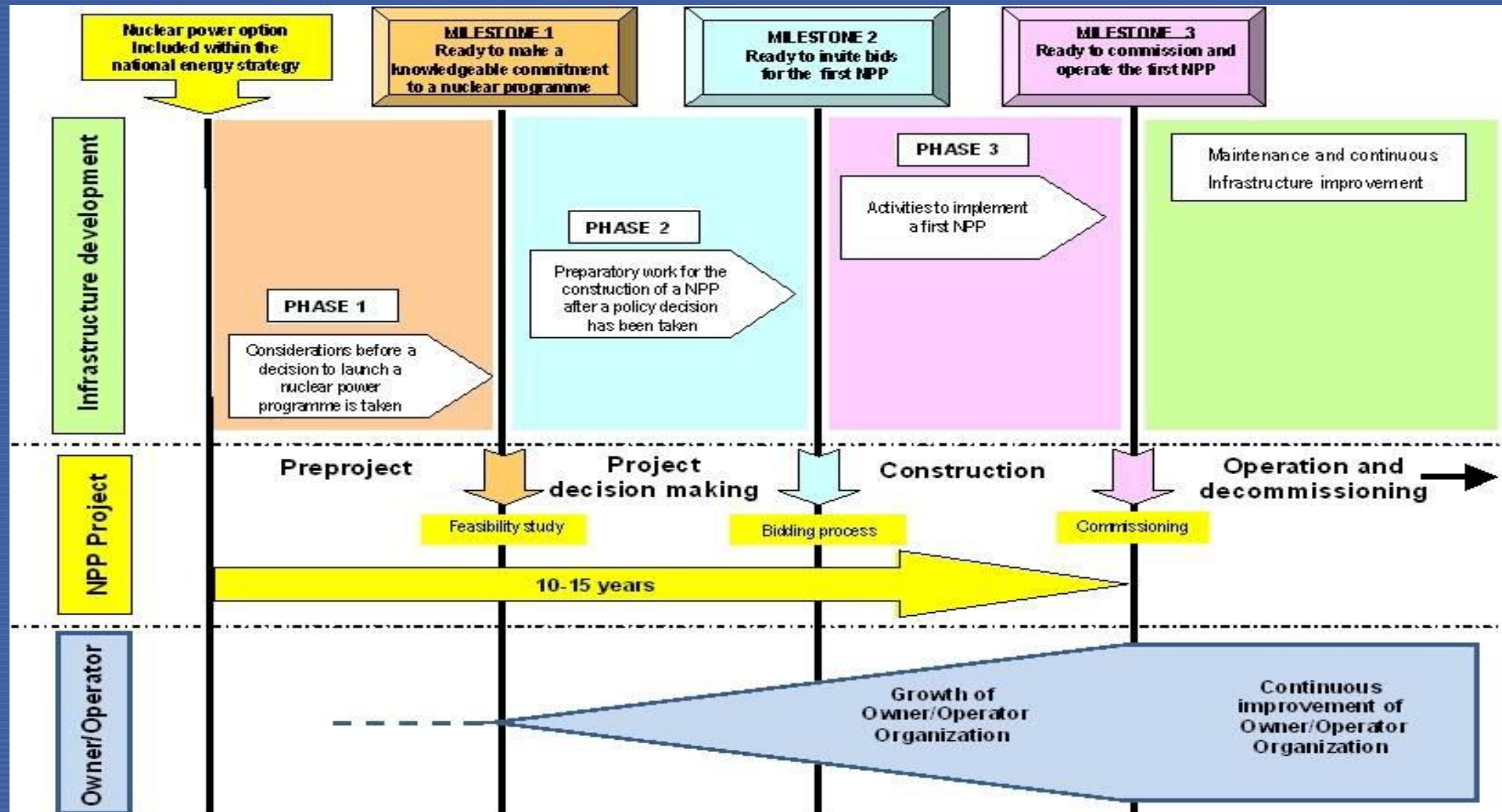
NPP OWNER/OPERATOR ESTABLISHMENT(1)



NPP OWNER/OPERATOR ESTABLISHMENT(2)

- ✓ Government's responsibility for decision on the establishment of the NPP Owner/Operator in Phase 2 of the program.
- ✓ Government decision should be based on the comprehensive understanding of all related issues and long term commitments associated with a nuclear power program, including the ownership approach (BOO, BOOT, Public Private Partnership) for the first NPP.
- ✓ NPP Owner/Operator organization may be an existing electricity utility, a new created organization (nuclear power utility) or a special purpose vehicle (Project Company).
- ✓ For the new created NPP Owner/Operator organization the Government must assure the funding from the state budget by the beginning of the commercial operation of the first NPP (6-7 years).

NPP OWNER/OPERATOR DEVELOPMENT



NPP OWNER ORGANIZATION IN PHASE 2

- ✓ Main activities of the NPP Owner/Operator are likely to start after Milestone 1 is reached and a formal decision is made to proceed with developing the first NPP project.
- ✓ In Phase 2, no need to have a large or complete organization.
- ✓ NPP Owner usually starts with a taskforce team/core group.
- ✓ NPP Owner/Operator will probably start as a core group of decision makers, managers and experts (medium number 30-40), with expertise in different NPP fields brought together to start the first NPP project.
- ✓ The team will be smaller and less diversified, if a consultant shall be hired (recommended for first NPP).

NPP OWNER RESPONSIBILITIES IN PHASE 2 (1)

- ✓ Provide the relevant technical inputs for the choice of the appropriate nuclear technology for the country.
- ✓ Selection of the contractual approach for the construction of the first NPP.
- ✓ Develop the financial strategy and financial plan in consultation with the government authorities and foreign and local sources of finance.
- ✓ Preparation of the Bid Invitation Specification (BIS).
- ✓ Develop capabilities for NPP bids evaluation and contract negotiations in Phase 3.

NPP OWNER RESPONSIBILITIES IN PHASE 2 (2)

- ✓ Review the NPP Vendors references and qualifications.
- ✓ Establish the applicable integrated management system including the organizational chart.
- ✓ Define the areas of competence to be established in its organization.
- ✓ Develop plans to recruit and train staff for Phase 3.
- ✓ Establish efficient and effective working relationships with the regulatory bodies.
- ✓ Prepare and implement the strategy for dealing with the public.

NPP OWNER RESPONSIBILITIES IN PHASE 3

- ✓ Invite and evaluate NPP bids.
- ✓ Liaise with the regulatory bodies.
- ✓ Place contracts for the supply and construction of the NPP.
- ✓ Prepare all required documentation to obtain the necessary licenses in accordance with the national regulations.
- ✓ Manage and supervise the construction of the first NPP in accordance with design bases, regulatory requirements and contractual provision.
- ✓ Revision of the organizational chart with NPP Vendor.
- ✓ Recruit and train operating personnel, and arrange for them to be licensed where required.
- ✓ Develop its organisation and management system to be suitable for an operating NPP.

NPP OWNER ORGANIZATION BEYOND PHASE 3

- Beyond Milestone 3, when the construction of the NPP is completed and the NPP is commissioned, the NPP Owner/Operator will have the responsibility for the long-term operation, maintenance, plant life management, and decommissioning.
- IAEA had specific documents with recommendations for this period of NPP life:
 - ✓ Conduct of Operations at Nuclear Power Plants, IAEA Safety Guide No. NS-G-2.14, IAEA, Vienna (2008)
 - ✓ Conduct of Operations at Nuclear Power Plants, IAEA Safety Guide No. NS-G-2.14, IAEA, Vienna (2008)
 - ✓ The Operating Organization for Nuclear Power Plants, IAEA safety standards series No. NS-G-2.4 (2002)
 - ✓ Managing the First NPP Project, IAEA-TECDOC-1555, IAEA, Vienna (2007)

NPP OWNER/OPERATOR ATTRIBUTES

Licensable

[legal entity with ultimate responsibility]

Integrated management system

[areas: safety, health, environment, quality, security, economics, commerce, social]

Manages growth and change

[ready for rapid change in size, functions, organization, management techniques]

Learning organization

[structured, continual improvement]

Strong safety culture

[self-disciplined, inherent in actions, enhancement of safety]

Empowers employees

[encourage individuals to take 'ownership']

Assesses of performance

[self/independent, events reporting]

Good communicator

[simple and clear, internal/external]

Effective leader

[managers influence by saying and doing]

Technically competent

[sufficient knowledge, expertise]

Commercially competent

[exercise to control costs, generate a profit]

HUMAN RESOURCES DEVELOPMENT (1)

Phase 2:

- ✓ Recruit, select and hire appropriate staff for the specific activities of the first NPP Owner/Operator organization (BIS, bids analyses, etc.).
- ✓ Appoint key managers/directors with previous experience in the energy/electricity field.
- ✓ Use Systematic Approach to Train (SAT) to provide appropriate and enough training for NPP Owner/Operator staff.
- ✓ Develop the specific program with IAEA assistance and NPP Vendors countries for staff training, including scientific visits in MSs with developed nuclear power program.

HUMAN RESOURCES DEVELOPMENT (2)

Phase 3:

- ✓ Prepare specific training programs using also the reference plant assistance, including training on the Full Scope Simulator.
- ✓ Involve future operation team earlier in the commissioning stage, taking into account that the best training is “on the job” training.
- ✓ Be prepared to select/retain the highly qualified workforce from sub-contractors used during the construction and commissioning of the first NPP.
- ✓ Establish a strategy for preservation of the own staff with experience from first NPP construction and commissioning stages for supervision activities inside the NPP Owner/Operator organization.

INTEGRATED MANAGEMENT SYSTEM

- ✓ Establish a management system and business process inside the NPP Owner/Operator based on the IAEA GS-R3 standard requirements, from the beginning of the NPP Owner/Operator organization (**Phase 2**).
- ✓ Use a document control and management system starting with the initial stage of the first NPP (**Bid Invitation Specification**).
- ✓ After contract for the first NPP become effective (**Phase 3**), review the management system and business process inside the NPP Owner/Operator using the reference plant experience.
- ✓ Make sure that processes like document control, material management and IT used by NPP Vendor/EPC Contractor during construction of the first NPP shall be the same for the operation of the NPP (**Phase 3**).

STRONG SAFETY CULTURE

- ❑ Implement the Safety Culture program inside the NPP Owner/Operator organization from the beginning or at least before nuclear fuel loading by the following actions:
 - ✓ Clearly define the responsibilities of various levels of the NPP Owner/Operator organization.
 - ✓ Hold supervisors and managers responsible and accountable for safety.
 - ✓ Implement risk assessment methods for all activities.
 - ✓ Develop objectives and targets for the organization's safety and health program, after deliberations among all levels of employees.
 - ✓ Substitute fault finding by fact finding.
 - ✓ Develop openness and transparency.
- ❑ Team commitment to safety must become the dominant factor inside the NPP Owner/Operator organization.

OTHERS CHALLENGES

First NPP licensing process:

- ✓ Develop and implement earlier a licensing program for the first NPP, together with Regulatory Authority, to be able to prepare all required support documentation before nuclear fuel load.
- ✓ Maintain good, honest and transparent relationships with all the involved stakeholders.

Stakeholders:

- ✓ Maintain a continuous dialog with local communities and support different programs for their development. Make yourself visible in helping to solve their social issues/problems.

International cooperation:

- ✓ Become member of an international organization or NPP operators (WANO, NPP Owners group, etc) and use their expertise for “peer review”, starting with commissioning of the first NPP.

IAEA ASSISTANCE PACKAGE

- ✓ IAEA assistance package for NPP Owner /Operator
<http://www.iaea.org/NuclearPower/Infrastructure/Package-for-owner/index.html>
 - 1. Workshops (WS)** on the NPP Owner/Operator responsibilities and managerial aspects;
 - 2. Expert Missions (EM)** on the specific aspects of the NPP Owner/Operator activities (Feasibility Study, Bid Invitation Specification, Integrated Management Systems, etc.)
 - 3. Review services and “peer review” missions.**
- ✓ This IAEA assistance package, including others potential IAEA assistance (Fellowships and Scientific Visits in the similar organization of developed MSs), should be available through **IAEA Technical Cooperation program.**

WORKSHOPS (1)

Suggested sequence	When is recommended	Subject of WS
1	Earlier Phase 2	Nuclear Power Program Management, including NP P Owner/Operator interfaces
2	Earlier Phase 2	Establishment of the NPP Owner/Operator organization, including Capacity Building
3	Earlier Phase 2	New Nuclear Power Programs: How to Become a Knowledgeable Customer
4	Beginning of Phase 2	Integrated Management System, Leadership and Safety Culture for the NPP Owner/Operator organization
5	Beginning of Phase 2	NPP Feasibility Study(FS) preparation
6	Beginning of Phase 2	NPP site selection

WORKSHOPS (2)

Suggested sequence	When is recommended	Subject of WS
7	Beginning of Phase 2	Interfaces with NPP Owner/Operator in a BOO/BOOT approach
8	Middle of Phase 2	Stakeholder involvement
9	Middle of Phase 2	NPP bidding process, including BIS preparation
10	Late in Phase 2	NPP Project Management
11	Late in Phase 2 Beginning of Phase 3	Interfaces of NPP Owner/Operator with Regulatory Bodies for the first NPP licensing
12	Late in Phase 2 Beginning of Phase 3	Management of Construction of the NPP Project
13	Beginning of Phase 3	Management of Commissioning of the NPP Project
14	Beginning of Phase 3	Emergency Preparedness and interfaces with stakeholders

EXPERT MISSIONS

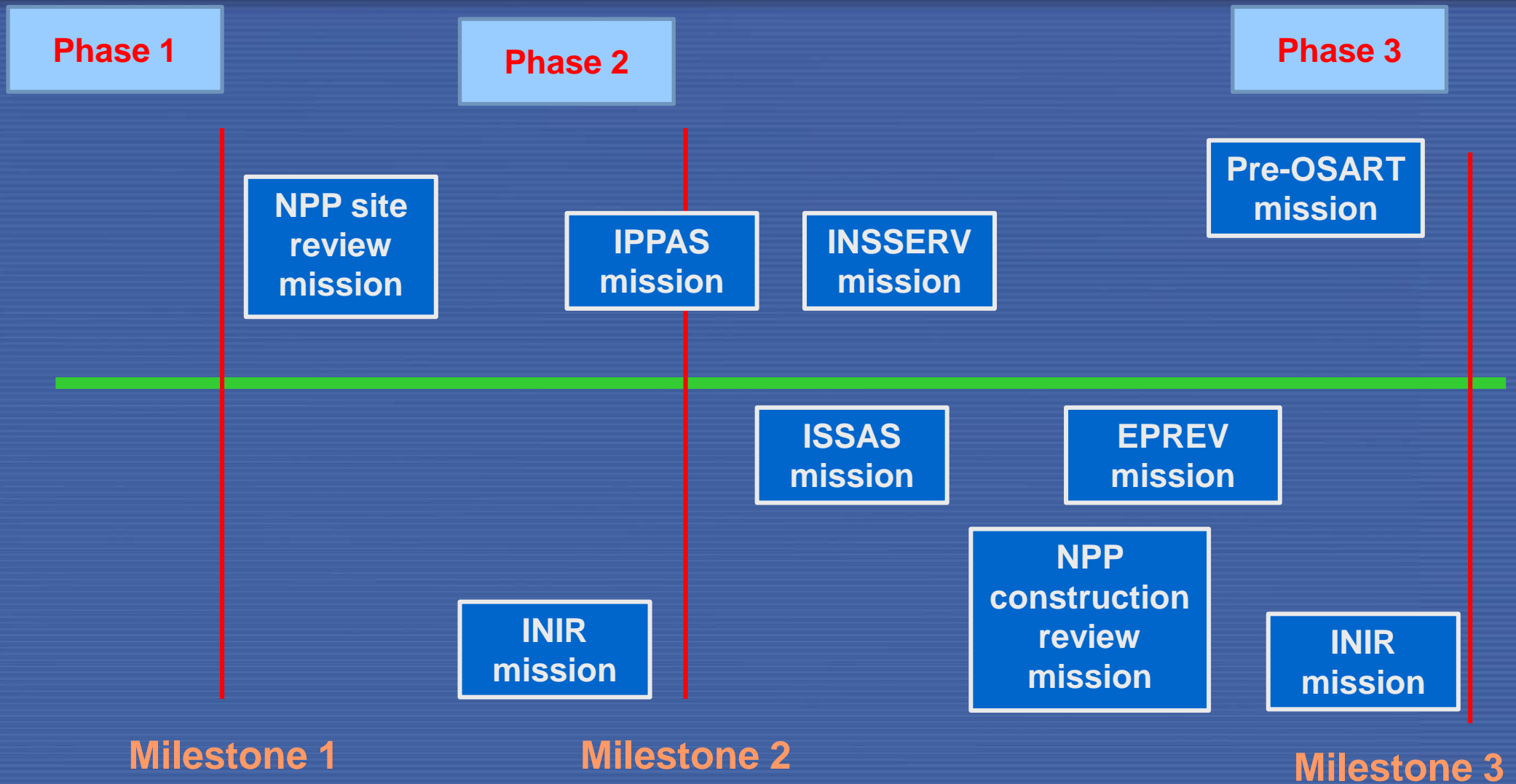
No.	When is required	Subject of WS	Main scope
1	Phase 2	First NPP Feasibility Study (FS) review	To review the draft of the Feasibility Study for the first NPP
2	Phase 2	Review the NPP Owner/Operator Human Resources Development plan	To review the draft of the HRD plan of the NPP Owner/Operator organization
3	Late in Phase 2	Review of the Bid Invitation Specification (BIS)	To review the draft of the BIS for the first NPP prepared by NPP Owner/Operator organization
4	Beginning of Phase 3	Review the Integrated Management System (IMS) of the NPP Owner/Operator	To review the IMS manual and main procedures of the NPP Owner/Operator organization
5	Phase 3	Review construction management process of the first NPP	To review the first NPP construction management process developed by the NPP Owner/Operator organization

IAEA REVIEW SERVICES (1)

Services available for NPP Owner/Operator organization in Phases 2 and 3 :

1. Site and Seismic Safety Review Services
 2. International Physical Protection Advisory Services **IPPAS**
 3. International Security Advisory Service: **INSSERV**
 4. State Systems of Accounting for and Control of Nuclear Material mission: **ISSAS**
 5. NPP Construction Review Services (under development)
 6. Emergency Preparedness Review Services: **EPREV**
 7. Operational Safety Review Team: **pre-OSART** for NPP commissioning
- Note:** Others similar mission should be available from others international organizations (WANO, NPP Owners groups, etc.)
8. Integrated Nuclear Infrastructure Review (**INIR**) missions in Phase 2 and 3

IAEA REVIEW SERVICES (2)



IAEA GUIDANCE DOCUMENT

IAEA Nuclear Energy Series

Technical Reports

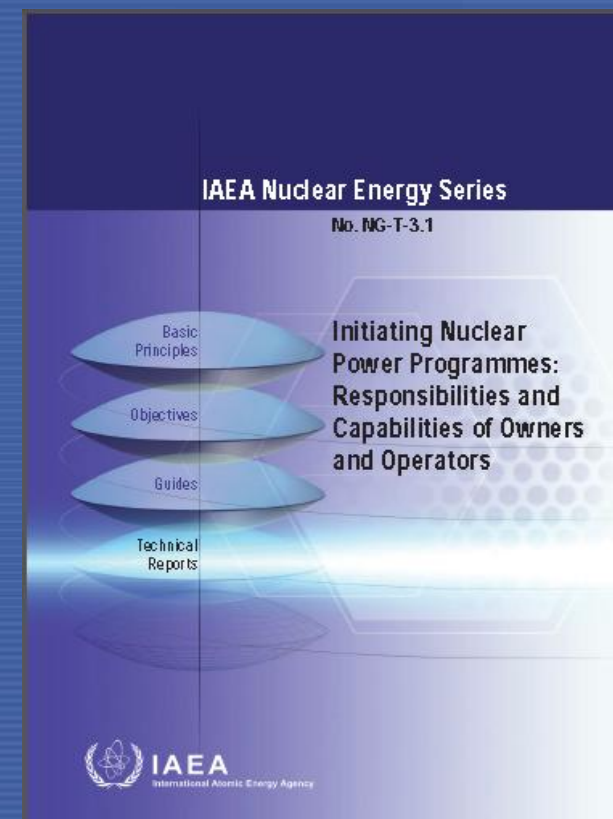
Initiating Nuclear Power Programmes:

Responsibilities and Capabilities of Owners and Operators

No. NG-T-3.1/2009

Content:

- ✓ Main activities and responsibilities of the owner/operator
- ✓ Desirable attributes for the owner/operator
- ✓ Owner/operator organizational aspects
- ✓ First NPP contract structure
- ✓ Interfaces with stakeholders



CONCLUSION

- ✓ Primary responsibility for safety rests with the NPP operating organization.
- ✓ NPP Owner/Operator is on the frontline for guarantying nuclear safety, not the NPP Vendor or various consultants.
- ✓ NPP Owner/Operator responsibilities shall not be delegated to others and this demonstrate the importance and the benefit to have a strong and knowledgeable NPP Owner/Operator involved in NPP building and in the development its skill to run the NPP safely and efficiently.
- ✓ IAEA Assistance Package for future NPP Owner/Operator is an integral part of the IAEA Action Plan on Nuclear Safety and should help Member States embarking on a Nuclear Power program.

International Atomic Energy Agency



Thank you for your attention !