

International Atomic Energy Agency

**Workshop on IAEA Tools for Nuclear Energy System Assessment
for Long-Term Planning and Development**

IAEA, 20-23 July 2009

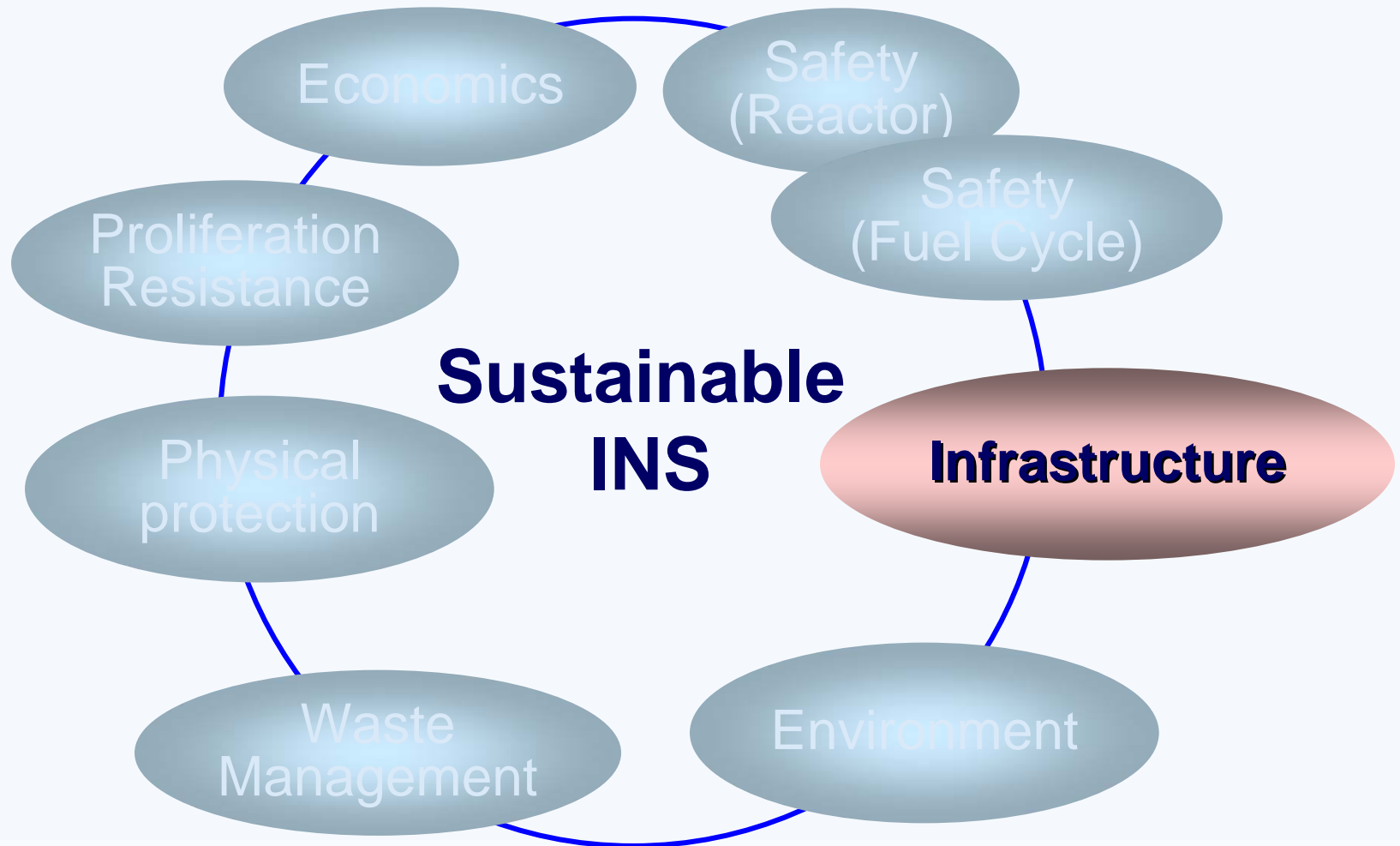
Assessment on the area of **Infrastructure**

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**IAEA TC Project INT/4/142: Promoting Technology Development and Application
of Future Nuclear Energy Systems in Developing Countries**

INPRO and Sustainability



Overview

- The Manual (TECDOC-1575, Vol.3) focuses on assessing the status of an infrastructure - planned or existing - in the context of a **holistic assessment of the INS** and its long-term sustainability
- The Manual was **frozen in 2006** and since then three IAEA documents dealing with Infrastructure have been published:
 - Milestones in the Development of a National Infrastructure for Nuclear Power (IAEA NE Series No. NG-G-3.1)
 - Evaluation of the Status of National Infrastructure Development (IAEA NE Series No. NG-T-3.2)
 - Integrated Nuclear Infrastructure Review Missions (INIR)
- This presentation is primarily based on TECDOC -1575 since it was the document used in the AS.



Basic Principle on Infrastructure

One Basic Principle

“Regional and international arrangements shall provide options that enable any country that so wishes to adopt, maintain, or enlarge an INS for the supply of energy and related products without making an excessive investment in national infrastructure”.



BP Justification

To establish the infrastructure necessary to **plan** for and then **acquire** and safely and securely **operate** a NPP, a country requires a significant **investment** on time and effort by a number of organizations (government, owner/operator, regulator, industry, etc.).

The BP calls for innovations in institutional arrangements to provide options in implementing the necessary infrastructure to reduce the infrastructure burden



User Requirements

Four URs have been set out to ensure that the various factors that need to be taken into account, have been evaluated.

These are grouped into:

- Legal and institutional considerations, UR1
- Industrial and economic considerations, UR2
- Political support and public acceptance, UR3, and
- Human resources, UR4.

For each UR, one or more criteria have been defined, and, in general, for each criteria, one or more evaluation parameters have been specified



Assessment (1)

- The assessors job is to determine if the Evaluation Parameters for a given Criteria are satisfied and hence the Criteria and the URs
- The Manual discusses options to reduce the investments required to satisfy each of the UR

Note: To **establish** a nuclear infrastructure, a new comer country is directed to **NPES** and to the guidance provided in the **IAEA documents**,



Assessment (2)

- To **establish** and **assess** progress regarding development of its nuclear infrastructure, a **newcomer** country should use the guidance provided in:
 - Milestones in the Development of a National Infrastructure for Nuclear Power (IAEA NE Series No. NG-G-3.1)
 - Evaluation of the Status of National Infrastructure Development IAEA NE Series No. NG-T-3.2)
 - Integrated Nuclear Infrastructure Review Missions (INIR)
- Once a newcomer country has its first NPPs in operation and its national infrastructure in place to support its nuclear power programme, the INPRO Infrastructure Assessment would be relevant.



Legal and Institutional Considerations

- **Prior to deployment of an INS/installation, the legal framework should be established to cover the issues of nuclear liability, safety and radiation protection, environmental protection, control of operation, waste management and decomm, security, and non-proliferation.**
 - **Legal framework established in accordance with international standards – four evaluation parameters covering scope and adequacy of nuclear law, international conventions and treaties, and regulations and guidelines, including relevant references**
 - **State organizations established in accordance with international standards – regulatory regime, etc.**



Industrial and Economic Considerations

- The industrial and economic infrastructure of a country planning to install an INS should be adequate to support the project throughout the complete lifetime of the NP program, including planning, construction, operation, decomm and related waste management activities.
 - **Credit lines sufficient** to cover infrastructure component of program – financing of plants covered in economics
 - **Demand for and price of** products adequate to enable a satisfactory financial return – covered in economics
 - **Size of installation** matches local needs - uses output from energy planning study



Industrial and Economic Considerations

- **The industrial and economic infrastructure of a country planning to install an INS installation should be adequate to support the project throughout the complete lifetime of the nuclear power program, including planning, construction, operation, decommissioning and related waste management activities**
 - **Infrastructure to support owner/operator is available, domestically or externally – survey of national capacity and plan /policy for national participation**
 - **Overall added value of installation exceeds investment in infrastructure – cost benefit studies justify government and industrial investments, may be qualitative**



Political Support and public acceptance (1)

Adequate measures should be taken to achieve public acceptance of a planned INS installation to enable a long term government commitment to support the deployment of INS to be made and then sustained

- **Sufficient information provided to public, according to national requirements, taking into account international practice – national energy policy exists, benefits of nuclear power conveyed, public information programs in place and effective, public communications address issues of concern, and information is matched to needs of public**



Political Support and public acceptance (2)

Adequate measures should be taken to achieve public acceptance of a planned INS installation to enable a government commitment to support the deployment of INS to be made and then sustained

- **Participation of public in decision making process is sufficient according to national requirements – process used involves broadly representative sample of affected public, the process is conducted in an independent and unbiased manner, public is involved early, public involvement has an impact on policy**



Political Support and public acceptance (3)

Adequate measures should be taken to achieve public acceptance of a planned INS installation to enable a government commitment to support the deployment of INS to be made and then sustained

- **Public acceptance should be sufficient** to ensure there is negligible political risk to policy support for NP – public surveys are performed on a regular basis to gauge public acceptance and results indicate a majority of the public support, or at least, do not oppose, NP and the trend with time is satisfactory (improving or remaining stable)
- **Government policy is supportive of nuclear**



Human resources (1)

The necessary human resources should be available to enable all responsible parties involved in a NP program to achieve safe, secure and economical operation of the INS installations during their lifetime. The owners/operators should have enough knowledge of the INS to be intelligent customers and keep a stable cadre of competent and trained staff



Human resources (2)

- Sufficient human resources should be available according to international practice – effective educational and training system in place, NP sector is an attractive sector, and sufficient resources can be made available (domestically or internationally) without undue negative impact on other industries
- Evidence should be available that a safety and security culture prevails



Summary re Assessment of Infrastructure

- NESAs using the INPRO methodology is suitable for assessing infrastructure for established or expanding INS
- Newcomer countries should use the Milestones approach for the initial development and assessment of their progress in developing a national infrastructure.





...Thank you for your attention!