International Framework for Nuclear Energy Cooperation: Localization of Nuclear Capabilities

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15th INPRO Dialogue Forum:
Sustainable Supply Chains for Advanced Nuclear Power Systems
Vienna, Austria
2-4 July, 2018
In Phase 2, the owner/operator should consider:

- Which national or local suppliers can reliably supply commodities, components or services to the nuclear related or non-nuclear portions of the nuclear power plant;

- Which upgrades in skills and capabilities are realistic in the time frame that would be required to support nuclear construction.

Decisions should be made about using national or foreign sources for commodities, components and services, and these should be reflected in any localization criteria in the bid invitation specifications developed in this phase.
London Financing Workshop
London, United Kingdom
May 9-10, 2012
### Key Findings from Workshop

#### Importance of an Effective, Independent Regulatory Body

- An effective, independent regulatory body that is open and transparent is extremely important to the financial community when determining whether or not to lend, the rate at which the lending would be provided, the readiness of investors to invest and risk premiums.
- The regulator increases assurance that the project can be confidently developed in compliance with all safety-based requirements and with effective independent oversight that is directly responsible to the public.

#### Essential Role of Government Commitment and Support

- The depth of commitment and host country support is the starting point for project evaluation by the financial community.
- Commitment of the host country will be evident in the rationale as to why a nuclear project is being proposed rather than other available energy options.
- Without visible and consistent backing of the host government, it is unlikely that the interest and confidence needed in the project from the investor and financial community will develop.
- Long-term government support backing its commitment is essential for any project to go forward as planned.

#### Need for a Sound Business/Project Plan

- There is a need for a clear overall business plan that underpins and helps bound the project.
- The ability to finance a NPP will depend to a large extent on the quality of the project plan that has been developed.
- The scope and content of the plan will demonstrate the extent to which critical issues have been identified and are being managed.
- Broad stakeholder involvement early in the planning process is crucial to project success.
Third African Conference on Energy and Nuclear Power in Africa

13-15 April 2015
Mombasa, Kenya

Assessing African energy needs and planning for the future

The First IAEA-IFNEC Jointly Organized Event
EPC PROJECT EXECUTION SOLUTION?

EPC LOCALIZATION
SKILLS AND KNOWLEDGE TRANSFER (SKT)

- Project is best opportunity
- Plan what must be achieved
- Identify target learners / core competencies
- Share the motives
- Define how SKT is funded

Kusile Power Station
Witbank, Mpumalanga Province, South Africa

Effective SKT during execution, thorough approach
EPC LOCALIZATION
SKT SUCCESS

For programme execution, the objectives should define:

Why?
- Establishes programme foundation

What?
- Includes concrete details / actions

How?
- Defines on-the-job vs. classroom training, discreet project metrics

The programme must start early.
EPC LOCALIZATION, SKT BEST PRACTICES

- SKT Coordinator is needed for a programme with >20 learners or 3 disciplines
- Coaches must understand that SKT is as important as other project execution activities
- Learners must understand their personal gains
- Stakeholders must be patient and encourage participants
- SKT vs. Efficiency, early discrete metrics at Contract

Having realistic expectations is critical for successful programs.
4-6 December 2006 Workshop in Vienna

“Issues for the Introduction of Nuclear Power”
http://www-pub.iaea.org/MTCD/Meetings/Meetings2006.asp

By

- Representatives from Member States without a NPP, who have indicated their interest in using NPP for electricity generation or desalination.
- Representatives from Member States who are supplier countries or other countries with an interest in the future application of NE.
- Level of participation:
  - Senior representatives of responsible energy supply Ministries
  - Senior Executives of power companies
  - Senior Directors of Atomic Energy Commissions or equivalent
  - Heads of Regulatory Bodies (Nuclear, Environmental or Commercial)
<table>
<thead>
<tr>
<th>Plant Year Commissioned</th>
<th>Power Type</th>
<th>Design and Engineering</th>
<th>NSSS (Sub)</th>
<th>Equipment Design &amp; Manufacturing</th>
<th>TG (Sub)</th>
<th>Equipment Design &amp; Manufacturing</th>
<th>Balance of Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kori 1 1978</td>
<td>587 PWR</td>
<td>5%</td>
<td>Westinghouse</td>
<td>0%</td>
<td>GEC</td>
<td>0%</td>
<td>8%</td>
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<tr>
<td>Kori 2 1983</td>
<td>650 PWR</td>
<td>5%</td>
<td>Westinghouse</td>
<td>0%</td>
<td>GEC</td>
<td>0%</td>
<td>9%</td>
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<tr>
<td>Wolsung 1 1983</td>
<td>679 PHWR</td>
<td>15.8%</td>
<td>AECL</td>
<td>0%</td>
<td>NEI</td>
<td>0%</td>
<td>11.3%</td>
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<td>950 PWR</td>
<td>26.8%</td>
<td>Westinghouse (KHIC)</td>
<td>9.7%</td>
<td>GEC (KHIC)</td>
<td>11.8%</td>
<td>40.1%</td>
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<td>Yonggwang 1/2 1986/87</td>
<td>950 PWR</td>
<td>30.3%</td>
<td>Westinghouse (KHIC)</td>
<td>14.7%</td>
<td>Westinghouse (KHIC)</td>
<td>27.6%</td>
<td>45.1%</td>
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<td>Ulchin 1/2 1988/89</td>
<td>950 PWR</td>
<td>46.0%</td>
<td>Framatome (KHIC)</td>
<td>28.2%</td>
<td>Alsthom (KHIC)</td>
<td>41.3%</td>
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<tr>
<td>Yonggwang 3/4 1995/96</td>
<td>10000 PWR</td>
<td>79.0%</td>
<td>KHIC (CE)</td>
<td>68%</td>
<td>KHIC (GE)</td>
<td>82%</td>
<td>72%</td>
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</tbody>
</table>
Equipment Localization Process

Equipment localization would follow the steps described below:

- Preparation of localization Plan
- Survey capabilities of local companies
- Identification of local companies’ needs
- Selection of local companies

- Technical Cooperation Program
  - Facility Upgrade
  - QA Program (ASME Certification)
- Support for Approved Vendor Registration

- Technical support & Transfer of documents
  - Manufacturing
  - Quality Plan
  - Welding requirement
  - Dispatch engineers, etc.
- Training (CRT, OJT)
Localization and Industrial Involvement for the Construction of Jordan Nuclear Power Plant

Dr. Kamal J. Araj, Vice Chairman
Jordan Atomic Energy Commission

Global Supply Chain and Localization Conference

7 November 2017
Paris, France
# Some Localization Opportunities

<table>
<thead>
<tr>
<th>Construction works</th>
<th>Local Industries</th>
<th>Services and others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil, electrical and mechanical construction</td>
<td>Cement, Concrete</td>
<td>Engineering design and supervision</td>
</tr>
<tr>
<td>Site preparation &amp; excavation</td>
<td>Industrial grade tanks and heat Exchangers</td>
<td>Consultations and studies</td>
</tr>
<tr>
<td>Road works and asphalt mixtures</td>
<td>Building chemicals, adhesives and additives</td>
<td>Transportation, Cranes, handling and logistics</td>
</tr>
<tr>
<td>Concrete works</td>
<td>Insulating materials</td>
<td>Field inspection</td>
</tr>
<tr>
<td>Start-up material such as sand, gravel and others</td>
<td>paints and pastes</td>
<td>Qualified labour force in the construction field</td>
</tr>
<tr>
<td>Carpentry, steel and aluminum works</td>
<td>Electrical wires and cables, lighting systems</td>
<td></td>
</tr>
<tr>
<td>Finishing and decoration works</td>
<td>General safety and fire fighting</td>
<td></td>
</tr>
<tr>
<td>Tests for construction materials and quality control</td>
<td>Works of ventilation, air conditioning</td>
<td></td>
</tr>
<tr>
<td>Non-distractive testing</td>
<td>Pipes and air ducts</td>
<td></td>
</tr>
</tbody>
</table>
Summary

- Be able to articulate the costs and advantages of localization in concrete terms
  - Convince your lenders the advantages are worth the costs

- Plan the execution of your localization program
  - Have realistic expectations and participant buy-in

- Identify an achievable result and schedule
  - Don’t do it all and don’t do it all at once

- Use the people you train for national infrastructure development