Localization and industrial involvement in Jordan NPP project

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Jordan Atomic Energy Commission
Jordan Country Profile

- Total Area: 89,213 Km²
- Sea Port: Aqaba
- Coastline: 26 Km
- Population: 9.5 Million (2.5m gests) 2015 est.
  60% (15-64)
  35% (below 15)
- Climate: Mediterranean & Arid Desert
- GDP: $37.52 billion (2015 est.)
- Per Capita: $3967.04 (2015 est.)
- Annual GDP Growth forecasted: 4.5% (2016-2020)*
JAEC’s Current Activities

Jordan’s Nuclear Projects

HRD
- Education & Training
- Research Reactor
- Subcritical Assembly

Uranium Exploration

Nuclear Power Plant Project
Financing Challenges for Jordan in Particular

- Scale of the investment relative to Jordan’s GDP
- Limited Government financing
- Jordan’s credit rating and the ability to provide sovereign guarantees
- First nuclear power plant – no track record of construction or operation
- Regional issues
Jordan’s Nuclear Power Plant Project

- Two Pressurized Water Reactors (PWR).
- Generation III+
- Output: 2 X 1000 MWe.
- Lifetime: 60 years.
SMR as an Option

- Replace aging fossil plants.
- Can be located close to population areas.
- In-land away from water sources.
- Mid to high seismicity
- Cogeneration of heat & electricity.
- Water and Air Cooled Condensers
- Load following Capabilities
Project Phases

**Phase I**

- Development Phase
  1. Conducting the required Site Characterization and
  2. Environmental Impact Assessment for the Site/Project.
  3. Preparing and finalizing the Bankable Feasibility Study
  4. Finalization of all project agreements and contracts.
  5. Securing the Financing for the project and Finalizing all Phase II related Project Agreements.

**Phase II**

- Implementation Phase
  1. Technical Design and Development including Engineering Survey
  2. Power Plant Construction
**Introduction**

- Jordan has a vast experience in working with foreign companies in Jordan and abroad especially in civil construction.

- The unique industry (nuclear) requirements are slightly different and highly regulated.

- The product’s shelf life is 60 years and requires special manufacturing processes.

- The fact that only 2 reactors are planned to be built in Jordan makes establishing some industries not feasible.

- Localization will boost the public acceptance for the NPP project.
Local supply chains involvements

- The localization percentage has been set to be at a minimum of 20% in (BIS)

- This ambitious localization percentage could be achieved if proper local industry preparation takes place coupled with investment in industry upgrade which might be possible in the 2nd NPP unit

- Local industry should compete in a commercial basis in terms of price and quality

- Incentives and subsides are difficult because of Jordan open trade policy and mutual agreements especially with neighboring countries

- Dialogue between owner/operator /vendors regarding local suppliers should start before Signing of the EPC contract with the vendor
In 2013 JAEC hosted IAEA workshop in national participation
- government institutes and industry regulators were invited
- Exploring other countries experience and lessons learned
- During the workshop, 33 representatives from local industry and construction contractors met with IAEA experts

Workshop recommendations:
- Set-up of localization planning committee
- Start a survey and qualification for Jordanian suppliers
- Set-up policies for promoting national participation & capability
## Localization Planning Committee Members

**JAEC formed a national localization committee headed by JAEC, members from:**

- Related Ministries and government institutions
- Industry regulators (chambers of industry)
- Professional societies (Engineers, Contractors)
- R&D institutions

<table>
<thead>
<tr>
<th>Government Institutions</th>
<th>None-Government Institutions</th>
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<tbody>
<tr>
<td>Jordan Atomic Energy Commission</td>
<td>Jordan Chamber of Industry</td>
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<td>Jordan Nuclear Power Company</td>
<td>Amman Chamber of Industry</td>
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<tr>
<td>Minister of Industry, Trade and Supplies</td>
<td>Jordan Engineers Association</td>
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<tr>
<td>Ministry of Public Works and Housing</td>
<td>Jordanian Constructions Contractors Association</td>
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<td>Ministry of Energy and Minerals Recourses</td>
<td>King Abdullah II Design and Development Bureau (KADDB)</td>
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<tr>
<td>Ministry of Higher Education and Scientific Research</td>
<td>(Other institutes and experts as needed)</td>
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<td>Ministry of Labor</td>
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<td>Jordan Armed Forces</td>
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<td>Jordan Standards and Metrology</td>
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Prior to survey

- A macro-economic study has been conducted that indicates a threefold benefit to the local economy in terms of the localization expenditure.

- Specification, quantities, construction materials, list of equipment, codes and standards were extracted from Bid documents to identify potential areas and opportunities for local industry.

- A general sorting of potential suppliers for NPP projects were completed.
Some expected outcomes for the Survey

After identifying the targeted local industrial and construction companies:

- The results will help the national localization committee for setting up the future localization policy and plans.

- Eventually, several short lists of candidates should be created,
  - suitable to supply without major upgrades
  - required major upgrades to be classified as “qualified suppliers”
  - Cost for upgrading should be agreed upon according to localization policy.

- Assess the capabilities of near to the site communities to promote local economic involvement in the programme during its various phases.
survey and qualification forms for Jordan NPP suppliers

In 2015, JAEC start a survey and qualification activity of Jordanian suppliers for the NPP project

- **Industry, commerce, and services sectors**
- **Construction contractors sector**

The survey forms were uploaded to:

- JAEC web site
  (http://www.jaec.gov.jo/)
- Ministry of Industry, Trade and Supply
  (http://www.mit.gov.jo/)
- Jordan construction contractors association web site
  (http://www.jcca.org.jo/)
- Amman chamber of industry web site
  (http://www.aci.org.jo)
- Advertise on daily newspapers
- Forms are also sent by e-mail
Localization and industry nationalization policy

- Based on the preliminary survey results of the received forms, Jordan perspectives, IAEA guidelines and other countries experiences, the localization and industry nationalization policy has been adopted.

- The existing document represents the position of both government and private related institutions including professional unions regarding localization in future nuclear power projects, to be followed in realistic consideration of the local available capabilities.

- Those positions will be reviewed and finalized when technology/vendor selected.

- The localization and industry nationalization policy will help during contract negotiations with possible vendor.

- The targeted percentage of local participation has been set to be not less than 20% of the value of the project.

- Equipment manufacturer specialization policy will be established based on the selected reactor type in future.
Localization and industry nationalization policy in NPP

- Local participation should not affect the cost of the project, work schedule, delivery, quality or safety

- The main supplier is solely responsible for delivery dates, quality, safety and compliance requirements of regulatory bodies

- Encourage local suppliers to engage into partnerships and cooperation with similar suppliers from the major supplier country or other countries

- Give priority to contractors and local suppliers in case of meeting the quality required and the possibility of completion of work, delivery, quantities and specifications required
Cont…. National policy

- Encourage the development of local suppliers taking into consideration the expected cost, benefit and volume of future work

- Working with the main supplier to transfer the technology, expertise, skills and training of local suppliers, including using intellectual property rights, information gained and licenses

- To establish and maintain a data base of information for capabilities of local suppliers and provide those information on demand
The main supplier should help in identifying
- requirements in terms of quality, management,
- introducing new systems and develop the available ones
- help reduce the cost of manufacturing and
- estimating the cost to make the required changes

Establishing a management system in the project company to:
- Cooperating between vendor and local suppliers
- Work to develop the quality and safety procedures and meet
  requirements of the main supplier and
- Classification of supplies to local or joint or external origin

Encouraging the cooperation of industrial companies with
universities and R&D centers training centers to develop their
products
Cont.... National policy

- Giving priority to the Jordanian worker provided that the percentage of the Jordanian worker is not less than 50%
- Giving priority to suppliers and workers from areas adjacent to the site of the nuclear plant project
- Use a specific type of nuclear reactor technology as possible to accumulate knowledge and adapt to the requirements of the project and specifications required
- Adopting the principle of open and competitive bidding between local suppliers
Cont.... National policy

- Working during the construction phase to develop
  - necessary plans to provide the needed supplies in operation and maintenance phases
  - records of design changes during construction and modifications during operation “Design Authority”

- Encourage the establishment of an association of local suppliers to the nuclear plant as a platform for cooperation and exchange of experiences

- Promoting nuclear safety culture and quality control of local suppliers
<table>
<thead>
<tr>
<th>Construction works</th>
<th>Local Industries</th>
<th>Services and others</th>
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</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</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>Non-safety electrical wires and cables, lighting systems</td>
<td>Security services</td>
</tr>
<tr>
<td>Finishing and decoration works</td>
<td>General safety and fire fighting</td>
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<tr>
<td>Tests for construction materials and quality control</td>
<td>Works of ventilation, air conditioning</td>
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Thank You