



# GNPPO NEWSLETTER

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## In This Issue

Involvement of Local Industries in Ghana's Nuclear Power Programme

- Benefit of local Industrial Participation in Nuclear Power Programme
- Localisation of Ghana's Nuclear Power Programme

## About GNPPO

**T**he Ghana Nuclear Power Programme Organisation (GNPPO) is mandated with the task of coordinating, overseeing and administering the phase-to-phase implementation of the Nuclear Power Programme in Ghana.

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## INVOLVEMENT OF LOCAL INDUSTRIES IN GHANA'S NUCLEAR POWER PROGRAMME

### BACKGROUND

A wide range of materials and services are required to construct a nuclear power plant and to support its operation. Provision of these materials and services comes with strict compliance with high standards associated with nuclear power projects. An active and reliable Involvement of Industries are, therefore, key to the successful implementation of a sustainable Nuclear power programme in any country for clean, reliable and affordable electricity. This is why industrial involvement is very critical to nuclear power programmes. Industrial Involvement refers to the entire industrial capability required to support a safe and reliable nuclear power programme. At the heart of industrial involvement is the capacity and active involvement of local industries.

Local industrial involvement is one of the major areas of concern when developing a nuclear power programme. Countries embarking on nuclear power programmes must make informed decisions about which parts of industrial involvement need to be developed locally and plan for the

development of appropriate local industry, capable of supporting the national nuclear power programme and related projects. This requires countries to

- Formulate policies for industrial capacity and participation in the nuclear power programme
- Identify the current capacity of local industries
- Develop and implement strategies that would build the capacity of local industries to meet the local content requirement as captured in the policy

In most cases, local industrial involvement increases over the lifetime of a nuclear power programme. It is unlikely, for a variety of reasons, that the entire industrial involvement needed for a nuclear power programme especially for the first nuclear power plant will be supplied by local or national organisation. Of all the IAEA Member States that currently operate nuclear power plants none relied completely on its local or national organisation.

One of the most compelling reasons to maintain a portion of the

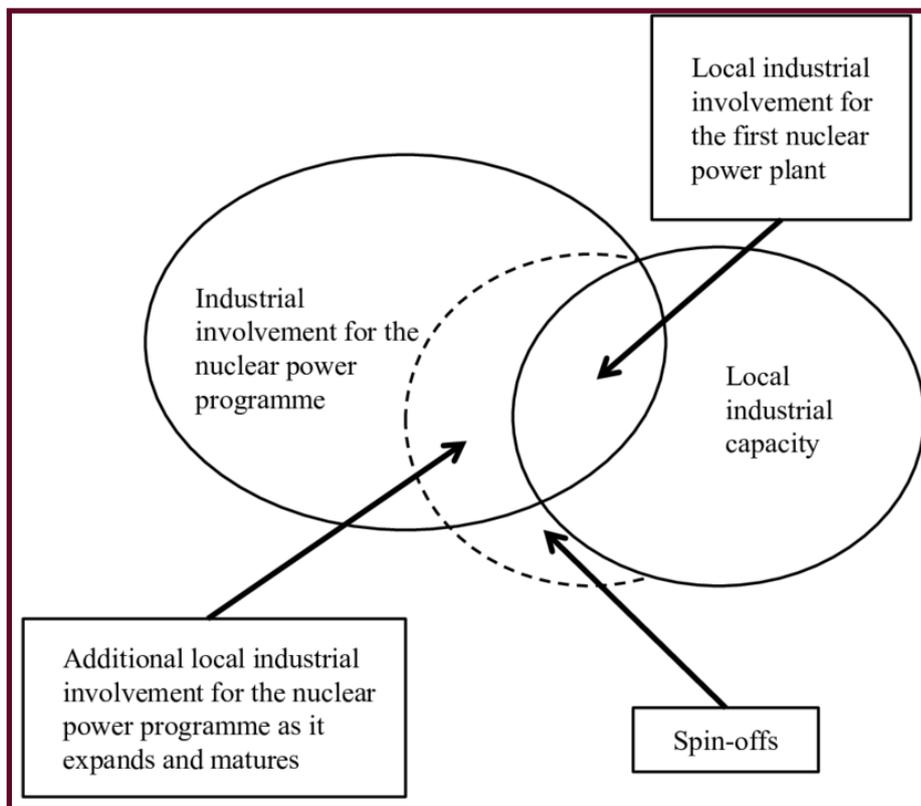
supply of goods and services from outside the country is cost effectiveness.

In some cases, it is less costly to acquire a product or service from a specialised supplier outside the country than it is to develop the capability locally. Another reason may be the inability of local suppliers to meet the high standards and requirements for nuclear components. Similarly, the acceptance of intellectual property agreements as a condition of supply could be imposed by technology vendors and by hardware and software suppliers. Finally, the State's adherence to non-proliferation agreements may limit the involvement of national industries in fuel supply and reprocessing.

The Figure below shows the relationships between the total industrial involvement needed for a nuclear power programme and local industrial involvement. The solid lines show the relationship when the first nuclear power plant(s) is/are constructed and commissioned whilst the dotted lines show the relationship as the nuclear power programme expands.

### **BENEFITS OF LOCAL INDUSTRY PARTICIPATION IN NUCLEAR POWER PROGRAMMES**

Local industry participation in nuclear power programme comes with business opportunities, avenues for job creation and upgrade of local industries and hence present a clear justification



**Figure 1: -Relationship between total industrial involvement and local industrial involvement**

for directing efforts at ensuring optimum and capable involvement of local industries in Ghana's nuclear power programme. From the start of the programme, local industry involvement may be mainly in civil construction, mechanical and electrical installation, plant operation and maintenance, as well as in support services. National investment directed at developing and implementing internationally accepted industrial standards in such areas as, engineering, manufacturing, civil construction, installation, operation and maintenance, service delivery and technical support will inure to the building of a competitive industry with the capability to participate in the nation's nuclear power programme and other international projects.

In a number of countries, increasing national industrial involve

ment in the nuclear power programme developed over time has had spin-off benefits for other industrial sectors. These are attributable to the acquired technological capability for the nuclear power programme. The following are some nuclear technologies that have been applied to areas outside nuclear power programmes:

- Seismic response technology, which is used in base isolated foundations for buildings.
- Remote controlled safety inspection technology used in the maintenance of ships
- Non-destructive inspection technology, such as X ray and neutron radiography
- Gamma ray spectrometry, ultrasonic, acoustic and associated imaging technologies.
- Hot laboratory equipment, such as remotely manipulated robotics and devices for harsh environments.

- Waste management technology used in the solidification of sludge and ashes from incinerators, and high efficiency filters for desalination.
- Laser techniques, such as isotope separation, laser cutting and improving residual stress, can be used in modeling and simulation techniques (fluid dynamics, thermo-hydraulics, and material and component behavior).

Local industry participation in a nuclear power programme also has the great advantage of reducing capital investment and generation cost of power. The use of competent local labour leads to a reduction of dependence on foreign labour and also reduction of imports.

### **Localisation OF GHANA'S NUCLEAR POWER PROGRAMME**

Recognizing the importance of local industrial involvement in nuclear power programmes, the Ghana Nuclear Power Programme Organisation has developed and is implementing an industrial involvement strategy with particular interest in localisation, based not only on greater participation in the construction of Ghana's future nuclear power plants but also on continuous support to the operating plants by manufacturing spare parts and replacement components as well as rendering technical services in fuel management, testing and in-service inspection among others. The long-term expectation

of the localisation strategy is to upgrade local industry standards and technical know-how to better compete internationally.

The strategy underscores government's role in contributing to the efforts of building national industry capacity by providing the enabling environment and implementing incentive programmes. It calls for the conduct of a cost benefit analysis which should guide the decision on the industry sector to develop and the extent of such development. It also calls for active steps to be instituted, as part of any nuclear transaction, to introduce new capabilities and upgrade existing capabilities in the many different areas that a nuclear project will require. National investment should be directed at building artisan skills such as, teamsters, sheet metal workers, pipe-fitters, painters, operating engineers, millwrights, masons, insulators, iron workers, electricians, instrument fitters, carpenters and boiler makers and also all sorts of engineering and layout design professionals.

Building up the appropriate expertise for a nuclear power programme involves many stakeholders in order to develop key expertise in as many fields as possible. It is essential that impetus comes from government and the designated owner/operator. Arrangements as in joint ventures, technology transfer initiatives and financing are among the plausible initiatives needed to support local industry to timely develop the

required capability so that local industry can be ready to effectively participate in Ghana's nuclear power programme.

### **KEY ACTIONS TAKEN BY THE GNPPO**

#### ***Engagement of local industries and Prospective vendors***

A wide range of local industries have been engaged at several gatherings to sensitize them about the diverse roles they can play as well as the benefits they stand to derive from Ghana's Nuclear Power Programme. The GNPPO has, for example taken advantage of the Ghana Industrial summit which has taken place every year in recent times to engage local industries and also facilitated dialogue between local industries and nuclear technology holders such as ROSATOM who attend such summits. Such dialogue are necessary to bridge the gap between required standards and what can be offered by local industries and also reveal areas of participation that require upgrade

#### ***Review of Existing Local Content and Participation Policies, Regulations and Laws***

The GNPPO has identified the legislative Instrument, (LI2354, 2017) as the closest in regulation to the requirements of a Nuclear power programme. The LI2354, 2017 has been reviewed and recommendations have been made for a possible amendment to ensure its suitability for the localisation of Ghana's nuclear power

programme. The legislative instrument in its present state provides an enabling environment to ensure the maximum use of financial capital, expertise, goods and services locally to create employment for Ghanaians, promote businesses in the electricity supply industry and retain the benefit in the country.

Although the LI provides a comprehensive coverage of issues relating to local content and local participation, it mainly focuses on electricity supply and does not provide for capacity addition and generation where the introduction of Nuclear power belongs. The GNPPPO has made specific recommendations to include Electricity capacity addition, generation and supply for all options including Nuclear power and must take into consideration the manufacture of equipment, appliances, components parts and materials for use in power plants including Nuclear power plants. A number of existing institutional and industry specific local content policies have also been identified and are under review to help develop a localisation policy for Ghana's Nuclear power programme consistent with international best practices.

### ***Local industry Appraisal***

The overall plan for effective participation of local industry in the nation's nuclear power programme takes into consideration the determination of localisation provisions, conduct of local industry appraisal, development or review of existing local con-

tent/participation framework to suit the requirements of a nuclear power industry, development of local industry upgrade programmes and ranking of industries based on their potential or suitability to participate in the nuclear power programme.

The GNPPPO has conducted a local industry appraisal to determine the capability and capacity of local industry to participate in the Nuclear power Programme. A four stage approach of rolling out the appraisal process was developed and consisted of, a desktop survey, taking local industry inventory, site visitation, data collection and appraisal.

The following categories of local companies participated in the appraisal: Engineering Companies; Manufacturing Companies; Civil Construction and System Assembly Companies; Electrical/Electronic Instrumentation Companies; Operations and Maintenance Companies; Supply Chain; Heavy Equipment Handling and Transportation Companies.

The study revealed a generally low level (less than 20%) of possible participation of local industries in Ghana's nuclear power project on the basis of project cost.

The results also showed areas of participation as masonry, carpentry, welding, steel bending and fabrication, tile laying, spraying, pipe fitting, plumbing, painting, scaffolding, glazing, rigging and POP installation. Engineering areas of possible participation are

electrical, mechanical, civil, structural, geological, geotechnical and architectural.

However, the results are considered not to be conclusive enough owing to the poor participation of industries in the appraisal and the fact that most industries failed to provide the relevant parameters needed for the estimation of the participation ratio for various reasons.

The GNPPPO therefore intends to fashion out a programme to enhance industry's understanding on the need for the appraisal to be conducted to properly position them to provide the needed parameters to be used to update the present results. However, in the interim, there is the need to consciously direct effort at developing the needed expertise that are presently absent in local industries and enhancing the existing capacity to meet the need for nuclear power projects.

### **PLANNED ACTIVITIES**

The GNPPPO has planned the following activities among other things to best position local industries to take advantage of the benefits that Nuclear Power offers.

- Site visitation and extensive engagement with all the local industries that took part in the local industry appraisal and any other relevant local industries that may be identified. This will offer the GNPPPO the opportunity to be abreast with the current status of local industry capacity and capability.

- Design and implementation of upgrade programmes for local industries taking into account international best practices as well as the codes and standards required for the Nuclear Power Programme.

- Development of a localisation policy for the entire Nuclear Power Programme.

### CONCLUSION

The GNPPPO, in the exercise of its mandate and being aware of the enormous benefits that the

nuclear power programme offers to local industries is committed to exploring all options to allow Government to make and implement policies that will promote efficient participation of local industries in the nuclear power programme.



*Fig. 1: Ghana Industrial Summit & Exhibition (GISE) 2018*