**Concept Number:** IRA2012001

**Title:** Further increasing NPPD's Capability in planning and implementing activities related to design and construction of two new pressurized light water NPP units in Bushehr with emphasis on safety

**Original Language Title:** ?????

**Project Number:** ?????

**Project Type:** National

**Project Class:** Category A

**Submitted By:** Member State

**Field of Activity:** 06 - Nuclear power reactors

**Participating Member State(s):**
Iran, Islamic Republic of

**Project duration (Total number of years):** 4

**Project duration (Start date):** 2014-01-01

**Overall Objective:** To further strengthen NPPD’s capabilities for the effective project management during the design and construction phases of its new two pressurized light water reactors with emphasis on safety.

**Objective Analysis:** In light of the current time-line whereby the contract for the two new units is expected to be signed by the 4th quarter of 2013, and on the basis of results/outputs from the implementation of BNPP-1and accumulated experience therein, it is necessary to address some identified infrastructure gaps and to incorporate feedbacks and lessons learned from BNPP-1 projects to further improve NPPD’s project management abilities with emphasis on time synchronization between the IAEA assistance and the updated national plan for two new units in Bushehr. The following are some of the project’s major areas and milestones for which Agency input (in terms of advice and technical support) are deemed necessary for its successful completion: assistance and technical support for independent review of site specific issues of selected design and contractual documents in order to obtain necessary permissions/licences, seismic safety and environmental impact reports, utilizing latest international practices in seismic design, analyses and testing; assessment of NPP project implementation; workforce planning and enhancement plans for human resource development for different stages of NPP project implementation; nuclear, radiation safety and nuclear security with promotion of ownership and safety culture; configuration management and management of interfaces.

**Gap / Problem / Need Analysis:** The Iranian authorities continue to place high priority on peaceful use of nuclear energy including the contribution of nuclear power generation capacity to the electric energy generation mix of the country. The Council of Nuclear Energy of Iran has decided that the Iranian nuclear power generation capacity should reach 8,000 -10,000 MW by the year 2030. On the basis of a 2005 law that has been ratified by the Iranian Parliament, the share of nuclear energy in the total electricity generation capacity of the country has been set to 20,000 MW for the coming three decades. In view of the above and in light of the lessons learned from the designing, constructing and commissioning of BNNP-1, there is an obvious need to optimize the current organisational structure and to improve the required skills and effectiveness in principal project management of the two new light water NPPs at Bushehr site. Support to the above-mentioned national efforts is currently being provided under TC project IRA4038 which aims at “strengthening the owner's capabilities for the successful implementation of two NPP units with pressurized light water reactors (PWR) in Bushehr for the safe and reliable increase in the country’s electricity generation capacity”. However, due to the re-phasing of the national plan for NPP development, there is a need to synchronize the time-line of TC’s assistance to this high-priority Iranian project with the national NPP development work-plan and financing schedule for the two new units, and for a follow-up to TC project IRA4038 whose work plan in line with milestones of the updated NPPD plan for two new PWR units at Bushehr site. The existing institutional infrastructure in Iran needs further strengthens in some areas to be fully in line with latest international safety requirements and practices.

**Role of nuclear technology:** Nuclear energy provides a sustainable option for generating electricity**.** The design and constructionof the two new PWR nuclear power units is supported by the existing nuclear power infrastructure and valuable experience gained during the period of safe and reliable construction, start-up and commissioning of the first NPP unit in Bushehr.

**Physical infrastructure and human resources:**  The required human and physical infrastructure is available to support the implementation of this project.

**Safety regulatory infrastructure:** Iran Nuclear Regulatory Authority (INRA) as the national nuclear regulatory body has been established and authorized to regulate nuclear and radiation safety and security through regulatory processes including issuing regulations, guidelines and conducting licensing and supervisory processes for sitting, design, construction, commissioning, operation and decommissioning of nuclear facilities and radiation installations or specific aspects thereof. The legal framework within which INRA operates includes the updated Act on Atomic Energy Organization of Iran, the Act in Radiation Protection , their regulations and other legal instruments that require persons or organizations to be licensed for carrying out any activities related to nuclear facilities or radiation installations, unless otherwise exempted. The associated regulations stipulate prerequisites for regulatory process and the obligations of licensee and workers. The national safety infrastructure and associated standards and procedures are in place and adequate to ensure that the project will be implemented in a safe manner.

**Stakeholder analysis and partnerships:** As in all nuclear power programmes of this size, and in the full knowledge of the Iranian government’s evident commitment and financial support to NPPD’s programme, the situation analysis reflects a number of interacting social, political, technical, financial, institutional and legal considerations that constitute a relevant context to this issue.The main national stakeholders are: the Nuclear Power Production and Development Co.(NPPD) as owner of the plant and responsible for planning and implementation of the project for design and construction of new NPP units; the Iranian Nuclear Regulatory Authority (INRA) is responsible for national nuclear regulatory system; the National education and training institutions is participating in NPPD human resource development programme; the Local industry organizations will participate in manufacturing and construction; the main outside partner shall be the Supplier Organization. A risk assessment analysis reflects a number of possible constraints and necessary measures shall be considered and timely implemented in order to monitor, analyse and address the potential risks in order to take necessary mitigation measures to overcome negative impact on project implementation.

**Other considerations, e.g. environment, gender:** The project will contribute to further improvement of project management during the design and construction phases of two new pressurized light water reactors in Bushehr with emphasis on safety which will help to eliminate and/or reduce potential hazards of to the environment and society. As an integral part of the project’s work plan, an Environmental Impact Report (EIR) will address all issues relevant to quality of air, water, land and ecosystem. Both, male and female, will participate in, benefit and make maximum use from assistance provided.

**Implementation strategy:** Project activities are expected to focus the Agency's assistance in further strengthening NPPD's safety and engineering capabilities through technical advice based on international safety standards, codes, and proven practices. Where possible, a train-the-trainers approach shall be utilized in order to maximize the multiplier effect of the support provided to the NPPD human resources and ensure the establishment of a core competent group within NPPD for that purpose. Established with the IAEA assistance a corporate knowledge management process will be strengthened in order to retain and utilize existing knowledge, competence and expertise. The project management approach relies on the strong ownership of the counterpart and the commitment of the project team to anticipate and address (through close monitoring, regular reviews and timely adjustments) the need for intervention and/or additional measures in order to mitigate potential negative impact on project implementation.

**Monitoring and progress reporting:** Through TC’s System for Periodic Reporting, self-assessment and regular reviews of implementation and output delivery will be monitored and used for project's progress and achievements reporting

**Risk management:** While all necessary national policies, financial support and commitments are in place for the construction of two new NPP units with PWR at BNPP site as a part of the nuclear power development programme for the next five years period, there are some potential limitations, that are beyond the complete control of the project team, that might impact the timely delivery of some project activities and outputs and achievement of the project’s objectives. Possible constraints include recruitment of IAEA qualified external experts for implementation of planned activities and the progress/success in placing Scientific Visits and Fellowships as a growing challenge.
Necessary measures will be considered and timely implemented in order to monitor, analyse and address the potential risks in order to take necessary mitigation measures to overcome negative impact on project implementation.

**Logical Framework Matrix (LFM)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Design Element** | **Indicator** | **Means of Verification** | **Assumptions** |
| **Outcome** |  Effective project management processes during design and construction of the two new PWR NPP units in Bushehr, with emphasis on safety. | A comprehensive set of project management processes during design and construction phases of the two new PWR NPP units in Bushehr  | Progress reports of relevant activities; Progress reports of relevant expert missions | Adequate external experts can be recruited for implementation of planned activities and adequate progress is made in finding suitable institutes for hosting Scientific Visits and Fellowships. Adequate resources are available for providing laboratory equipments and improved access to proper computer codes necessary for nuclear safety; Governmental support is provided to promote the programme - National/Local Companies interested and available - Technical Staff is available |
| **Output** | 1 Project Management Team Operational |  |  |  |
| 2 Improved owner’s safety and engineering capacity for planning and construction of two pressurized light water reactor NPP units | Demonstrated reliance on local staff to perform the necessary safety-related tasks and licensing processes | Experts' reports | Adequate external experts can be recruited for implementation of planned activities and adequate progress is made in finding suitable institutes for hosting Scientific Visits and Fellowships. Adequate resources are available for providing laboratory equipment and improved access to proper computer codes necessary for nuclear safety. |
| 3 An increased number of trained staff and implemented improved project management to promote and support strong ownership | Bi-annual lists of trained staff and training/qualifying events aimed at Increasing the capacity, enhancement of owner's competencies and continuous improvement of project management system to promote and support strong ownership with focus on nuclear safety | Bi-annual Progress report | All planned inputs shall be timely available |
| 4 Improved overall Human Resource Management (HRM) for the two new NPP units | Bi-annual report on the implementation of Workforce Plan aiming at Increased capacity and further strengthening the capabilities of the owner organization (NPPD) in improved overall Human Resource Management for new projects with focus on nuclear safety | Progress Report | All planned inputs shall be timely available |
| 5 Increased safety and quality capabilities of local organizations participating in manufacturing and construction of two new NPPs6 Infrastructure gaps identified and addressed including reediness for construction7. Increased public information and awareness  | Draft plan for the "Enhancement of national participation in planning and implementation of the project for the two new NPP units in Bushehr,Draft self-assessment performed and reviewed and action plan for addressing identified gaps developedFinal strategy Documents for owner(NPPD) and the draft plan for the "Establishment and implementation a public information and awareness programme" available for the endorsement of NPPD's authorities by Q4-2014 | Progress Report | All inputs shall be available timely |
| **Activity** | 1.1 Confirming/Setting-up project team (CP, CP team in MS, PMO/TO) |  |  |  |
| 1.2 Conducting project review meetings |  |  |  |
| 1.3 Updating and regular monitoring of project work plan |  |  |  |
| 1.4 Preparing and submitting PPARs (every six months) |  |  |  |
|  |  |  |  |
| 2.1 Thermo- hydraulic and neutronic codes for safety analysis |  |  |  |
|  |  |  |  |
|  (not within IAEA mandate) |  |  |  |
| 2.4 Training on generic reactor safety review |  |  |  |
| 2.5 Spent fuel and waste management programs |  |  |  |
| 3.1 Development of training materials for two new NPP projects |  |  |  |
| 3.2 Risk management during preconstruction and construction phases of an actual nuclear power plant. |  |  |  |
| 3.3 Safety and quality requirements for fresh fuel management for large scale pressurized light water reactors. |  |  |  |
| 3.4 Physical protection and nuclear security during pre-operational phases of two new PWR units in Bushehr |  |  |  |
|  (in the scope of 3.4) |  |  |  |
|  (in the scope of 3.4) |  |  |  |
| 4.1 Human Resource Development (HRD) and Work Force Planning (WFP) programmes for the two new PWR units in Bushehr |  |  |  |
|  (in the scope of 4.1) |  |  |  |
|  (in the scppe of 4.1) |  |  |  |
| 5.1 Safety and quality requirements for participating local organizations in construction of new PWR units at Bushehr |  |  |  |
|  (in the scope of 5.1)6.1 Support in addressing identified nuclear power infrastructure gaps7.1 Support in public information and awareness programmes development |  |  |  |
| **Input****Inputs to be elaborated on the basis of accepted outcome, outputs and activities** | 2.1.1 Providing and Training of Thyrmo hydrolic code |  |  |  |
| 2.2.1 Providing and training of Neutronic code |  |  |  |
| 2.3.1 # expert missions on the technical support to implement |  |  |  |
| 2.4.1 Expert Mission to assist training on generic reactor safety review |  |  |  |
| 2.5.1 Expert Mission |  |  |  |
| 3.1.1 Review |  |  |  |
| 3.2.1 one WS |  |  |  |
| 3.3.1 EM |  |  |  |
| 3.4.1 Workshop can be done. |  |  |  |
| 3.5.1 Evaluation of the system |  |  |  |
| 3.6.1 Expert Mission is suitable. |  |  |  |
| 4.1.1 Evaluation |  |  |  |
| 4.2.1 WP for new NPPs |  |  |  |
| 4.3.1 Review programme to up grade TS |  |  |  |
| 5.1.1 Review the strategy Doc. |  |  |  |
| 5.2.1 Familirization of Safety and security issues is very important for every partner to be involved in NPP design, construction and operation phases. |  |  |  |