

**INDEPENDENT PANEL OF EXPERTS (POE)
NEW KHANKI BARRAGE CONSTRUCTION PROJECT**

TERMS OF REFERENCE (TOR)

**RECRUTIMENT OF INDIVISUAL CONSULTANT
“GATES AND INSTRUMENTATION EXPERT –International”**

1. Back Ground Information and Objectives

New Khanki Barrage Construction (NKB) Project is going to be implemented by the Government of Punjab, Irrigation Department (PID), under a loan facility from Asian Development Bank (ADB). The project is situated on river Chenab in Gujranwala District of Punjab province. New Khanki barrage will assure sustainable irrigation supplies to about three million acres of very fertile land of the seven districts of central Punjab, through Lower Chenab Canal (LCC) irrigation system having present designed discharge capacity of 11,600 cusecs. Safe passage of floods will also be ensured due to enhancement of design capacity of the barrage from 800,000 cusecs to 1,100,000 cusecs.

The project mainly includes construction of a new barrage at a distance of 900 feet downstream of existing headworks in replacement of 120 years old outdated structure. New head regulator with silt excluder in left pocket will be constructed for Lower Chenab canal and the off-taking canal will be realigned in first 5000 feet to join with existing canal. New barrage with automation arrangement of radial gates for regulation of river and off-taking canal will ensure sustainable irrigation supplies and safe passage of floods. The NKBP will involve 0.82 million cubic meters of concrete, sheet piles, foundation and river training works. The project requires high level of inputs for (i) hydraulic and morphological aspect, (ii) planning and construction and (iii) radial gates with hoisting arrangement and instrumentation for 65 units of each weight 35 ton. Provision of a Panel of Experts (POE) for the project was agreed between PID and ADB during ADB Review Mission (25-27 February 2013).

Overall objectives of the POE are to provide high level and professional independent advices and guidance to support PMO objectivity and ensure safe, economical, state-of-the-art construction / installation, and quality assurance/quality control procedures for successful implementation of NKB Project, as well as minimizing the adverse impacts on public and environment, which might happen due to various construction and water-care-handling activities, canal closures and river diversion.

2. Expert Position and Duration

PMO Barrages, PID intends to appoint an individual consultant—Gates and Instrumentation Expert (International) in an independent POE for NKB Project. The construction period of NKB Project is spanned over 39 months and 12 months for DNP. It is anticipated that POE will meet eight (8) times during the currency of the Project, spending two weeks (15 days) for each meeting. Total input of the Gates and Instrumentation Expert has, therefore, been estimated as four (4) months on intermittent basis.

3. Qualification and Experience

Gates & Instrumentation Expert should have M.Sc in Mechanical or Hydro-Mechanical Engineering and at least twenty five (25) year experience in designing of hydraulic gates, hoisting arrangement, superstructures, design and installation of motorized controls hoisting arrangements and its automation for large scale water resources / irrigation works of similar nature (dams and barrages). Specific expertise in the following fields is required;

- Design and installation of radial gates including hosting arrangements & superstructures.
- Instrumentation / Automation in regulation of gates through local and central control system.

4. Detailed Tasks

Amongst the three members of POE, a chairperson will be appointed by PMO who will coordinate the activities of the POE and chair its meetings. PMO will ensure the participation of members and publish the reviews and recommendations of POE. Members of POE will jointly participate in its pre-scheduled meetings / site inspections for comprehensive and integrated understanding regarding any Project specific issue. POE will undertake an independent review of the project design reports, records, history; planning, designing, scheduling, construction procedures and techniques; canal closure programs and analysis for construction of cofferdam. With such background, the Gates and Instrumentation Expert shall:

- a) Review the adequacy of the Mechanical design of hydraulic / radial gates, hoist machines and its automation.
- b) Review electrical design of gates regulation system through local control and central control system and suggests any improvements / changes required for proper functioning of the hydraulic gates.
- c) Review the O&M plans for construction activities.
- d) Assist in preparation of Operation and Maintenance Manual of the Barrage

5. Reporting Requirements

The details regarding the meeting and deliverables by the POE are as under:

- i. POE meetings are required to be held during the design, implementation and post construction stages. These POE meetings will review the respective reports and plans prepared by the consultants and the client. Necessary site inspections and investigations may be conducted by POE depending upon the nature / severity of the issues.
- ii. At the end of each meeting the scheduled dates for the next meetings and tentative timing for the subsequent meeting will normally be fixed, to enable Panel members to arrange their individual schedule. Extraordinary meetings of the Panel members may be also called in critical situations, if considered necessary or desired by PMO.

- iii. The POE shall document the result of each of their meetings and overall conclusions and advices / recommendations following the field inspection(s) and their deliberation(s). The reports on the meetings shall be prepared, signed by all the members and presented to the PMO/higher authorities, prior to departure of the members. The reports shall briefly outline areas of concern, requests for additional analysis and present recommendations for action (if required).
- iv. Within two weeks the reports may be supplemented by the field inspection checklists and records of the interviews with field staff analysis, discussion or reference materials provided by the POE members. Any item urgent to the Project / barrage should be brought immediately to the attention of the PMO, in writing, prior to the recording the reports of the meeting. All reports will be presented and submitted to PMO.

6. Support Services

- a) The PMO shall assure availability of the designers, consultants or operators for discussions with POE, if desired by the POE. The POE will be provided with the necessary background information, relevant data, design, construction and operational records that relate to the barrages as well as proposed construction procedures and schedule of works. The POE shall also be free to ask the designers or other experts to conduct additional studies relating to the safety of the barrage.
- b) The PMO shall provide clerical, drafting and reproduction services for the preparation of the POE reports at Lahore, Pakistan. The PMO will take necessary actions to allow prompt travel clearance of POE members on their requests and arrange access to the project site.
- c) The PID shall assist in arranging for accommodation and travel for the members of the POE within Punjab, including the project area. The PID shall provide all other reasonable support to the POE during the site visits, the meetings and for the preparation of the Panel's reports.