

Consultancy Services for the Design, Supervision and Project Management of Weather Surveillance Radars and Works of PIU-PMD

Procurement Category:	Consultant Services
Procurement Method:	Consultants Quality and Cost Based Selection (QCBS)
Contract Type:	Time Based
Market Approach:	Open – International Competitive

Terms of Reference (ToRs)



**Modernization of Hydromet Services of PMD in Pakistan (MHSP)
Integrated Flood Resilience and Adaptation Project (IFRAP)
(Component 2: Strengthening Hydromet and Climate Services)**

**Pakistan Meteorological Department (PMD)
Ministry of Aviation (Aviation Division)**

Terms of Reference (TOR) for Consultancy Services for the Design, Supervision and Project Management of Weather Surveillance Radars and Works of PIU-PMD

1. Introduction

The Pakistan Meteorological Department (PMD) through Project Implementation Unit (PIU), seeks the services of a qualified consulting firm to provide Design Review and Supervision for the installation and commissioning of Weather Surveillance Radars at five strategic locations across Pakistan. These radars aim to enhance weather monitoring, early warning systems, and climate surveillance to improve disaster management, weather forecasting, and agricultural productivity.

2. Project Locations

The radar systems will be installed at the following locations:

- i. Gwadar (S-type)
- ii. Lahore (S-type)
- iii. Dera Ismail Khan (C-Type)
- iv. Cherat (C-Type)
- v. Quetta (X-Type)

3. Objectives of the Assignment

The main objectives of the consulting services are:

- i. To review and validate the design, specifications and technical aspects of the weather surveillance radars and associated infrastructure.
- ii. To supervise the installation, testing, commissioning, and integration of the radar systems (both new and existing radars).
- iii. To perform the role of Project Manager as defined in World Bank Standard Bidding Document and assume the overall responsibility for implementation of the Contract for 'Supply, Installation and Civil Works of Weather Surveillance Radars (Fixed and Mobile) with Power Backup System'.
- iv. The Project Manager shall represent and act for the Employer at all times during the performance of the Contract.
- v. All notices, instructions, orders, certificates, approvals and all other communications under the Contract shall be given by the Project Manager, except as herein otherwise provided.
- vi. To ensure the project meets the required technical, environmental, safety, and operational standards.

4. Scope of Work

The scope of the consulting firm's services includes, but is not limited to, the following:

4.1 Design Review

- i. Review of the design and technical specifications / standards of the radar systems submitted by the Contractor.
- ii. Revalidate the adequacy of the proposed site locations in terms of radar performance, environmental impact, and accessibility.
- iii. Review of the design of radar site infrastructure, including foundations, towers, communication systems, power supply, and backup systems.
- iv. Validate the compatibility of radar systems with existing meteorological networks and systems.
- v. Propose any necessary modifications or improvements to the design, without any substantial cost implications.

4.2 Supervision of Construction and Installation

- i. Provide oversight during the construction of site infrastructure and installation of the radar systems.
- ii. Approve the design and other technical specifications / standards submitted by the Contractor as defined in duties of Project Manager.
- iii. Prepare Quality Assurance Plan (QA/ QC Plan) including a detailed description of the Contractor's required organization, procedures facilities proposed to ensure that the construction is carried out in accordance with the Contract, Specifications and Drawings in accordance with modern concepts of project management.
- iv. Supervise the contractor's work to ensure it is in line with the approved design, technical standards, and project timelines.
- v. review and up-date the Contractor's program for implementation of various phases of the project and revise critical path analysis, if necessary.
- vi. Ensure compliance with environmental, health, and safety standards during construction and installation.
- vii. Monitor the quality of materials used in construction and ensure compliance with the specifications.
- viii. Validate the payments invoice submitted by the Contractor.
- ix. Attend, relevant project level meetings as required by the PIU.
- x. Carry out dispute resolution, as per provisions of the Conditions of Contract.
- xi. In the event of contractual dispute which may result in legal action, adjudication or arbitration between the Contractor and the Client, the consultants will, on the instructions from the Client, collate and prepare factual documentation describing the circumstances of the dispute. If required, the consultants will attend hearings and provide all legal and other support to the client.

4.3 Commissioning and Testing

- i. Supervise the testing, commissioning and integration of the radar systems along with the nominated team of PMD. The consultants along with PMD team will ensure that the final product meets the requirements given in the respective contract.
- ii. Ensure all components (hardware and software) are properly installed and functional.

- iii. Assist in the development and review of testing protocols and procedures.
- iv. Supervise and assist in integration of radar data with the national meteorological network and provide the required support to SI Consultants.

4.4 Training and Capacity Building

- i. Design the requirements and contents of the trainings to the Client's personnel on the operation, maintenance and troubleshoot of the radar systems. These trainings are included under the "Contract for Supply, Installation and Civil Works of Weather Surveillance Radars (Fixed and Mobile) with Power Backup System."
- ii. Review the user manual and maintenance guide for the radar systems submitted by the Contractor.

4.5 Project Reporting

- i. Provide regular progress reports to the client, including details on any issues, risks, and deviations from the project plan.
- ii. Ensure timely completion of milestones and final project completion.
- iii. Prepare final project close-out reports including performance assessments and recommendations for future projects.

5. Key Deliverables

Inception Report: will include the Consultant's Work Plan, detailed assignment of functions for the Consultant's personnel involved in the Component preparation and implementation, including any changes or additions agreed during negotiations prior to signing of the Contract and the proposed procedures for the Consultant's interactions with PMD. This Report must also clearly specify all risks and issues, which may negatively affect Project deadlines and effective execution of all works.

Design Review Report: Detailed analysis and recommendations on the radar system design submitted by the Contractor and site locations identified by PMD.

Monthly Progress Reports: Monthly Progress Reports shall be prepared on regular basis. The report shall indicate progress of execution of works required under the consulting assignment. The progress reports shall detail progress under the works contract. The issues that may hinder the planned implementation shall be flagged in these reports along with suggested remedial measures.

Final Commissioning Report: Complete documentation of radar system installation, testing, and commissioning.

Training Manuals and Documentation: User manuals and training materials for radar system operators. The Training and operation manual shall give the nature of periodic inspections to be made, physical interventions to be enforced by way of preventive and curative maintenance to be carried out every year and data to be collected and records maintained. The O&M procedures should be described in detail and should be "do-able" to maintain integrity of structures for their designed life.

Project Close-out Report: Final report summarizing project outcomes, listing up major problems encountered and actions taken besides including review of training needs for operational staff and making appropriate recommendations. It shall also summarize the final quantities and financial statement and give a resume of (i) project implementation experience; (ii) suggestions for improvement, sustainability and exit strategy; and (iii) impact assessment.

6. Consulting Team Requirements

Following matrix represents the Client's reflection on the Consultant's team composition and tentative estimation of person-months for project management, design review, construction management and other field staffing for performance of the assignment. However, the prospective consultants should propose their own breakdown of staffing and level of effort / staff work based on their own experience and evaluation of the proposed services.

INDICATIVE STAFFING REQUIREMENTS FOR DESIGN REVIEW AND SUPERVISION

Sr #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)	Tentative Input of Experts (Months)
KEY STAFF					
KEY EXPERTS (INTERNATIONAL)					
1	Project Manager / Team Leader	Master's degree or equivalent in Meteorology, Atmospheric and Earth Sciences, Engineering, Physics, Project Management, IT or any other relevant filed from a reputable university.	20	15 years' professional experience in planning, designing and construction supervision management of Weather Surveillance Radars including 05 years of specific experience in World Bank funded projects using ICB procedures.	12 in 24 months
2	Radar System Engineer	Master's Degree in Electrical Engineering, Computer Science, Computer Engineering or any other relevant filed from a reputable university.	20	12 years' professional experience in analysis, design, development and implementation of new and/or existing radar systems/sub-systems which may include Architectural Design, Requirements Engineering, or others and Support acquisition of hardware and software.	4 in 24 months
3	Contract Management Specialist	Master's degree or equivalent in Meteorology, Atmospheric and Earth Sciences, Engineering, Project Management	20	12 years' professional experience in the procurement of works/goods/services, contract management and processing of contractors'	3 in 24 months

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		or any other relevant filed from a reputable university.		claims including 05 years specific experience related to contract administration and claim handling on projects under World Bank financing, using ICB procedures.	
Sub-Total (International)					19
KEY EXPERTS (NATIONAL)					
1	Electrical and Communications Engineer	Master Degree in Electrical Engineering, Computer Science, Computer Engineering or any other relevant filed from a reputable university. An additional Master's degree in relevant field is preferable and would be rated higher.	15	10 years' professional experience in design, supervision and installation of radar systems and other allied works.	15 in 24 months
2	Design Engineer - Civil Structure	B.Sc. Civil Engineering and M.Sc. Structure Engineering.	15	10 Years' professional experience in design of buildings including 05 years specific experience in structural design of large infrastructure works	6 in 24 months
3	Environment and Social Safeguard Specialist	Master's degree in Environmental Sciences / Environmental Engineering, Sociology / Rural Sociology / Social Work / Social Sciences or equivalent	15	10 years' professional experience in conducting environmental screening/ assessment of large construction projects including 05 years' specific experience in similar position in accordance with GoP and World Bank's Environmental Guidelines	9 in 24 months
4	Training and Capacity Building Specialist	Master's degree or equivalent in Meteorology, Atmospheric and Earth Sciences, Engineering, Project Management or any other relevant filed from a reputable university.	15	10 years of professional experience in capacity building in relevant field.	6 in 24 months

Sr #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)	Tentative Input of Experts (Months)
5	Contract Management Expert	Master's degree or equivalent in Meteorology, Atmospheric and Earth Sciences, Engineering, Project Management or any other relevant filed from a reputable university.	15	10 years' professional experience in the procurement of works/goods/services, contract management and processing of contractors' claims including 05 years specific experience related to contract administration and claim handling on projects under World Bank financing, using ICB procedures.	15 in 24 months
Sub-Total (Key Experts)					51
Total (Key Experts) (International and National)					70
NON-KEY STAFF					
1	Office Coordinator	Bachelor's degree or equivalent in Meteorology, Atmospheric and Earth Sciences, Engineering, Project Management or any other relevant filed from a reputable university.	12	07 years' professional experience in relevant field	12 in 24 months
2	Assistant Resident Engineer Electronic	B.Sc. Electrical Engineering, Computer Science, Computer Engineering or any other relevant filed from a reputable university. An additional Master's degree in relevant field is preferable and would be rated higher.	12	07 years' professional experience in design, supervision and installation of electronic part of radar systems or other allied works.	18 in 24 months
3	Assistant Resident Engineer Electrical Power	B.Sc. Electrical Engineering, Computer Science, Computer Engineering or any other relevant filed from a reputable university. An additional Master's degree in relevant field is preferable and would be rated higher.	12	07 years' professional experience in design, supervision and installation of electric power part of radar systems or other allied works.	18 in 24 months

Sr #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)	Tentative Input of Experts (Months)
4	Assistant Resident Engineer Civil (Buildings)	B. Sc. Civil Engineering. An additional Master's degree in Construction Management is preferable and would be rated higher.	12	07 years' professional experience in construction supervision of civil works and allied civil infrastructure works.	18 in 24 months
5	Quality Control Engineer	B.Sc. Civil Engineering and preferably M.Sc. concrete structures/ Construction Management/ Geo-tech. Engineering	15	10 years' experience in quality control on construction of large construction projects. Also 5 years' specific experience in similar position on dams / barrages hydraulic structures on major rivers. He should be well versed with testing requirements for enforcing quality control on water resources projects.	12 in 24 months
Sub-Total (Non-Key Staff)					78
Total (Key and Non-Key Staff)					148

Notes:

- (i) *The above-mentioned person-months include Consultant's professional input only. The total person-month requirement for professional staff is 148 i.e. (Key Staff: 70 + Non-Key Staff: 78 person-months).*
- (ii) *All support staff will be provided by the Consultants who are required to include cost of such support staff in the Reimbursable Expenses items.*

7. Duration of the Assignment

The total duration of the assignment is expected to be **24 months for Construction Period and 12 months for Defect Liability Period**, starting from the date of contract signing. This includes the design review, supervision of construction, testing, commissioning, and handover.

8. Firm's Qualifications

The consulting firm should meet the following criteria:

- i. At least 10 years of experience in similar assignments related to weather radar systems or other large-scale meteorological projects.
- ii. Demonstrated experience in the supervision of installation and commissioning of weather surveillance radar systems.
- iii. Proven track record of project management in similar environments.

- iv. Experience working with government agencies and adherence to local and international standards.
- v. Understanding of radar principles, such as Doppler radar, dual-polarization radar, and phased array radar.
- vi. Knowledge of radar data processing techniques for weather information extraction.
- vii. Experience with radar calibration, maintenance, and quality control.

9. Client's Input and Counterpart Personnel

The client will provide:

- i. Access to all reports, studies, data, photographs, maps, and institutions relating to the works, access to all sites for surveys and investigations.
- ii. Assistance to procure all necessary administrative documents including but not limited to visas, exchange control documentation, import licenses, exemption certificates, work permits, driving licenses, resident visas.
- iii. System Integrator shall arrange their own office space and accommodation. However, client shall provide necessary space at Project Office / sites for mutual interaction.

10. Reporting and Coordination

- i. The consulting firm will report directly to the Project Implementation Unit (PIU PMD), the client.
- ii. Regular coordination meetings will be held to review progress and address any emerging issues.

11. Selection Method

The Consultant(s) will be selected in accordance with the World Bank's Procurement Regulations for IPF Borrowers" dated November 2020, following Quality and Cost Based Selection (QCBS) procurement method.