INDEPENDENT POWER TRANSMISSION OPERATOR S.A. (IPTO OR ADMIE)

Asset Management Department

CONSULTANCY SERVICES FOR THE DESIGN OF AN ASSET PERFORMANCE MANAGEMENT SYSTEM

Contents

1. Introduction

The Independent Power Transmission Operator (IPTO or ADMIE) intends to obtain and use an Asset Performance Management System (APMS). The main objective of an Asset Performance Management System is the optimal management of the Transmission System assets through the control and evaluation of their condition as well as through the timely proactive actions for preventing their failure in order to finally increase the system efficiency and reliability.

With the use of appropriate data and with the application of suitable methods and assessment models of asset's condition and of their residual life cycle, new proper maintenance and renovation policies will be issued. The maintenance policies will transform the time based maintenance practices into condition based maintenance. The renovation policies will assist IPTO in the formation of its asset renovation plan.

For this purpose, IPTO needs to cooperate with an experienced consultant firm, which will perform the design of the application of an APMS and will provide all the appropriate specifications to enable IPTO to proceed to the procurement procedure. This will be achieved by taking into account the current status of Asset Management and Maintenance Practices procedures and by proposing new methods and techniques, which will enable the application of an APMS.

2. Asset Portfolio

The term Transmission System Assets, refers to all power and protection equipment of Substations and EHV Substations as well as the equipment of the Transmission Lines. An indicative list of these assets, is the following:

- ✓ Power transformers
- ✓ Circuit breakers
- ✓ Disconnectors
- ✓ Protection equipment
- ✓ Transmission Lines

3. Scope of the consultancy

The scope of the consultancy services is the design of the application of an APMS which will include:

- Collection, recording and processing of all available (structured and unstructured from different sources) data of assets' condition, with the objective of:
  - ✓ Calculation and monitoring of equipment health indexes.
  - ✓ Determination of potential equipment failure modes and its level of service taking into consideration the asset criticality, the operational environment and the significance of the impact of a possible failure of the equipment.
  - ✓ Prediction of the asset condition and of its residual life, using the previous data and through the application of risk-based analysis.

- Monitoring of total asset cost across its life cycle from the procurement until its disposal.
- Issuing of asset maintenance and renovation strategies with the objective of their optimal management and to switch from time based maintenance into a condition based maintenance practice.

4. Project Analysis

4.1. Current assessment

a) Assessment and analysis of the current situation in IPTO regarding:
   - the collection, recording and processing of Transmission System assets' available data,
   - the management, the condition evaluation, the maintenance and renovation practices of Transmission System assets

   and propose:

   - The sectors and actions which should be improved (e.g. development of additional condition monitoring systems, extended use of operational data)
   - The development of new actions (e.g. interface with ERP and EMS-SCADA, calculation of asset health indexes and new methods for maintenance and renovation decision making).

b) Assessment of existing IT systems (e.g. GIS) and telecom infrastructures for supporting APMS.

4.2. APMS Design

a) Design of a roadmap for the development and the application of the APMS. The design should include:
   - The compliance of the proposed APMS with the following ISO standards:
     - ✓55000: Asset Management – Overview, principles and Terminology,
     - ✓55001:Asset Management: System Requirements and
     - ✓55002: Asset Management – Management Systems – Guidelines for the application of ISO 55001
   - The incorporation of the APMS into the IT corporate strategy.
   - The development of a Strategic Asset Management Plan.

b) Proposal of suitable KPIs for APMS evaluation.

c) Definition of appropriate IT tools and telecom infrastructure for the implementation of APMS.

4.3. Specifications for implementing APMS

a) Specifications for the application of online monitoring system on the following equipment:
   - Power transformers

- Circuit breakers
- Disconnectors
- Transmission Lines
- Protection equipment

The specifications will include a proposal for all the required types of data, for the monitoring systems that should be installed and finally the implementation of the collection, recording and processing the data.

b) Specifications for the procurement of an APMS incorporating a Decision Making System, for the Transmission Assets evaluation through the calculation of appropriate indexes and the determination and provision of equipment asset condition by combining data from:

- on-line monitoring systems,
- off-line diagnostic measurements,
- operational data,
- historical data and failure reports

The final objective will be to

1. optimize the maintenance practices considering that the main goal is to switch from a time based maintenance to a condition based maintenance practice and
2. develop a renovation/replacement equipment policy.

5. Deliverables (Documents in hard copies and digital media)

a. Assessment report of current status and proposals and new actions to improve asset management, maintenance and renovation practices.
b. Assessment report on existing IT systems and telecom infrastructures
c. Roadmap for the development and the application of the APMS.
d. Proposal of suitable KPIs for APMS evaluation
e. Definition of appropriate IT tools and telecom infrastructure for the implementation of APMS
f. Specifications for the application of online monitoring systems
g. APMS specifications

6. Project Duration

The candidate will include in its offer a Gant Chart of the project implementation schedule.

Total Duration: four (4) months

7. Meetings (Steering Committee)

During the whole period of the project: every two weeks a progress meeting with ADMIE's project team and a report to be provided.

8. Contents of Technical Proposal – Project Team

The technical proposal should cover all the project requirements that are referred in the "Call for Tender" document and should provide all the information and data needed for its evaluation. The contents of the technical proposal should contain **at least** the following chapters and subsections:

0. **Introduction**: Presentation of the participant and of its competence for the project implementation.
1. **Project background – Special requirements:** Total understanding of the project by the participant and of the project objectives and targets, special requirements and particularities, critical success factors, project risks and proposals for their mitigation.
2. **Implementation methodology:** Work packages and breakdown to actions/tasks, deliverables, timetable.
3. **Organizational scheme implementation:** Project team composition and proposed Project management scheme, roles /responsibilities and correspondence with project team's members, allocation of the proposed manpower per project team member and role and per work package or/and further analysis (e.g. per deliverable).
4. **Communication scheme**
5. **Quality assurance:** Quality control measures for assuring the quality of the deliverables.

For the description of the organizational scheme implementation, the participant should present the composition of the project team and the position/role of each member. Specifically, the participant should submit a list with the Project manager and of all the consultants/experts who will be occupied for the project implementation.

In particular, the project team should **at least** contain the following members:

- 1 Project manager (PM) (holding a University Degree), with at least **five** years' experience in similar consulting services projects or/and in implementing an Asset Performance Management System in Transmission System Operators (TSOs).
- 1 Expert Consultant (EC) (holding a University Degree), with at least **five** years' experience in similar consulting services projects or/and in implementing an Asset Performance Management System in the Electric Energy Sector
- At least 2 Special Experts (holding a University Degree), with at least of total **ten** years' experience in one or more of the following sectors:

Sector	Description of expertise
EEA1	**Transmission Grid System Operation**: Indicatively, SCADA/EMS/AGC.
EEA2	**Transmission Grid Asset Maintenance**: Indicatively, Digitalization of assets, Mobile Workforce Management, Mobile access to maintenance documentation, Autonomous drones for line inspections (air, sea), Sensor data analysis for grid status checks, Spatial imagery for grid infrastructure and environment.

EEA3	**Transmission Grid Asset Performance Management**: Indicatively, Financial performance, Informed asset investment decisions, Risk management covering different aspects, Improved services and outputs, Demonstrated social responsibility, Demonstrated compliance, Enhanced reputation, Organizational sustainability, Efficiency and effectiveness, EHS (environmental, healthandsafety) compliance; Quality of service; Extension of assets' lifespan

The Special Experts should **cumulatively** cover all the above sectors.

- At least 1 Special Expert (holding a University Degree), with an experience in the design and implementation of IT/Telecommunications projects and of at least of total **ten** years' experience in one or more of the following sectors:

Sector	Description of expertise
EEB1	**Information systems**: Indicatively, Service Oriented Architecture, data semantics, studies/analysis of business requirements for strategic projects, interoperability aspects, points of single contact, digita lsingle gateways, European and national digital service infrastructures.
EEB2	**Data science and Data Analytics**: Indicatively, Data management including big and opendata, spatial data, public and scientific data, data interoperability (syntactic and semantic), creation and application of specifications/standards/formats, open data and open data portals, data analytics (including big data), data supported decision making.
EEB3	**ICT infrastructure** (including telecommunication and network services): Indicatively, Data-center organization and management, telecommunication center organization and management, network management, network protocols, provisioning of infrastructure services. Software, Infrastructure and Platform as a Service, cloud interoperability, infrastructure services such as email, telephony, videoconference, multimedia etc.

The Special Experts should **cumulatively** cover all the above sectors.

In order to give evidence for the experience of the Project Manager and of the Experts as well as to facilitate the evaluation of the proposal, the participant should submit extensive curriculum vitae (CV) for each member with detailed description of the special expertise according to the above and to complete the relevant tables in the "Templates" Document 6.