HPOIL GAS PRIVATE LIMITED

(A Joint Venture of HPCL & OIL)

TENDER FOR

SUPPLY & IMPLEMENTATION OF GIS BASED CGD PLANNING, OPERATIONS AND MAINTENANCE MANAGEMENT SYSTEM FOR PIPELINE & ASSOCIATED ASSETS FOR GEOGRAPHICAL AREAS OF HPOIL GAS

TECHNICAL VOLUME

TENDER NO. HOGPL/2025-26/C&P/027

DATE: 06.12.2025

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1. INTRODUCTION

HPOIL Gas Pvt Ltd (HOGPL) is a 50:50 Joint Venture Company (HOGPL) of Hindustan Petroleum Corporation Limited (HPCL) and Oil India Limited (OIL). HOGPL is authorized by Petroleum and Natural Gas Regulatory Board (PNGRB) for developing and operating City Gas Distribution network in districts of Ambala-Kurukshetra, Kolhapur and Entire State of Nagaland.

2. PROJECT BRIEF

M/s HPOIL Gas Private Limited intends to Integrate its existing GIS Hexagon Solution into Open Source GIS based CGD Planning, Operation & Maintenance Management system for Pipeline & Associated Assets of Three GA's for a period of five (05) years.

3. SCOPE OF WORK

- Scope of work includes supply & implementation of Web & Mobile app based GIS based CGD Planning, Operation & Maintenance Management system within 3 months (Go Live) from the date of LOI/PO which includes 5 Years AMC (first year AMC cost included with software supply and 4 years AMC cost shall be paid through Line Item No. 4 on monthly basis) that includes remote software maintenance support, development & service cost including support for updating of various pipeline associated assets i.e. valve chambers, service regulators, CNG equipment's, etc. in the GIS Solution after Go-Live.
- Integration of existing GIS data of Steel and MDPE pipeline network & associated facilities for 3 (Three) GAs which is currently stored on HPOIL Gas cloud storage.

Detailed Scope of Work are as follows:

HPOIL GAS GEOGRAPHICAL AREAS:

S.No.	GAs	State	Activities
1	Kolhapur	Maharashtra	Supply & implementation of Web & Mobile app based GIS based CGD Planning, Operation & Maintenance Management system
2	Ambala-Kurukshetra	Haryana	
3	Dimapur, Kohima, Chumukedima, Niuland and other districts	Nagaland	

The scope of work of contractor specified in this document shall include, but not limited to the following. In case of conflict of this document with enclosed technical specifications, requirements mentioned in this document shall be governing.

The solution must have a robust data model and linear referencing capability for configuring a plan and approach methodology to carry out the work keeping in mind/ account the needs of pipeline data management, operation, maintenance, and safety.

The pipeline data model should have all the attributes and references for Steel and MDPE. Also, each feature class must have appropriate data types (Both Vector and Raster data types), Spatial data type, input forms and report generating forms.

The following works must be performed.

I. Supply & Implementation of Web based GIS CGD Planning, Operation & Maintenance Management system integrated with real time (with offline mode) mobile application (android and iOS).

II. Supply & Implementation of mobile application to capture day to day real time activities.

III. Integration of existing GIS database to the newly implemented solution.

IV. Annual Maintenance of the Web and mobile application that includes remote software maintenance support, development & service cost including support for updating various pipeline associated assets i.e. valve chambers, Service regulators, CNG Equipment's etc in the GIS Solution for period of 5 years (initial 1 year AMC included in line item 1) after go-live.

V. Training on implemented solution and data integration.

- **Detailed Scope of Work for Supply & implementation of Web & Mobile app based GIS based CGD Planning, Operation & Maintenance Management system.**

  Web Application Dashboard:

  - The Dashboard must show the important information related to all activities (Steel, MDPE, LMC etc) at a glance. Dashboard will be available in web application and mobile application.
  - The system should also come with a one-page Dashboard which will throw instant information like length wise pipeline, Nos. Of valves and other facilities, City Gate Stations (CGS), SV Station, Pipeline network, District Regulating Station (DRS), Meter Regulating Stations (MRS), Pressure Reduction Station (PRS), Mother Stations, CNG Stations, Control Rooms, Isolation Valves, Transition fitting, PNG Meters etc, Nos. of ongoing O&M activity, Nos. of inspection, incremental changes, newly added customer etc. Each feature must be available in Digital GIS Twin so as to show the fittings attributes and location.
  - Dashboard should be customizable as per HOGPL's need.
  - The analysis in graphical and chart format should be automatic and depends on the data that has been entered in the system.
  - The Charts can be printed/downloaded.
  - The Data should be downloadable in Excel/ CSV/ PDF formats.
  - A particular pipeline stretch, which is falling under which statutory body/charge area/municipality etc will be shown in this module.
  - Tagging/uploading of document with relevant features should be implemented in the application.

Web Application Features:

- Entire network view ability on one platform to manage database.
- Database of existing network may be shared by HOGPL in .shp/kml format.
- The system should be able to migrate the newly added maps/updated base map of area of interest (AOI) and provide seamless integrated view to the users.
- The solution must provide options for filtering the data on specific attributes of HOGPL's requirements. Filtering options must include the following:
    - Pipeline by route name/stretch
    - Pipeline passing through the area
    - Network size
    - Network Facilities like City Gate Station (CGS), Mother Station (MS), District Regulatory Station (DRS), Meter Regulatory Station (MRS), CNG Station etc.
    - Each valve of the Network shows clearly the network that is controlled by the subject valve. The feed area from each valve shall be filtered out when the option is selected and indicated separately.
- Display the GIS data layer wise i.e., showing with different symbols/ colors.
- The web GIS solution must have the specific tools in web application as mentioned below,
    - Layer visibility On/Off
    - Pan/Move, Zoom In, Zoom out tools.
    - Identity tool to find out attributes of a feature.
    - Measuring tools to find out distance and area measurements.
    - Get coordinates by clicking on the map.
    - Dynamic Query builder tool to see the results.
    - Search criteria.
    - Buffer region selection with BOQ generation.
    - Map printing and export into PDF/JPG.
    - Locating assets by entering latitude/longitude values or Asset ID.
- Displaying dia. wise pipeline layers with different color code.
- Hyper linking of existing documents such as as-built sketches, test commission reports can be attached to the pipeline/CGD assets.

Map View

The application will be designed to provide comprehensive information about a pipeline network.

The system will display various details related to the pipeline coverage, as-built pipeline network, pipeline type, thickness, grade, size, and important landmarks within a buffer region of the pipeline. Additionally, it will identify residential and commercial buildings in the vicinity of the pipeline network.

It will provide an overview of the pipeline's geographical distribution and relevant attributes.

- Pipeline Coverage Display:
  The system shall display the geographical representation of the pipeline network, indicating its coverage and geographical extent.

- As-Built Pipeline Network:
  The system shall present information about the as-built pipeline network, showing the actual layout (pdf/jpeg) and configuration of the pipelines.

- Pipeline Type Identification:
  The system shall identify and display the type of pipeline, whether it is made of steel or Medium-Density Polyethylene (MDPE).

- Pipeline Attributes:
  The system shall provide details about the pipeline's characteristics, including thickness, grade, and size.

- Landmarks within Buffer Region:
  The system shall identify and display important landmarks located within a buffer region of 20 meters from the pipeline network. Landmarks may include schools, fire stations, hospitals, police stations, state offices, etc.

- Industrial, Residential and Commercial Buildings:
  The system shall identify and display residential and commercial buildings present near the pipeline network.

The web application will include the following specific tools to enhance user interaction and provide comprehensive information about the pipeline network:

- ✓ *Layer Visibility On / Off:*
  This tool allows users to HOGPL, the visibility of different layers of information on the map. Users can select which layers, such as pipeline network, landmarks, buildings, etc., they want to display or hide.

- ✓ *Pan/Move, Zoom In, Zoom Out Tools:*
  These basic navigation tools will enable users to pan or move the map in different directions and zoom in or out to view specific areas in more detail.

- ✓ *Identity Tool:*
  The Identity tool will allow users to click on a specific feature or point on the map to retrieve its attributes or properties. For example, users can click on a pipeline segment to access information such as material type, diameter, age, etc.

- ✓ *Measuring Tools:*
  The application will provide measuring tools to calculate distance and area measurements on the map. Users can draw lines or shapes to measure distances between points or calculate the area of a selected region.

- ✓ *Get Coordinates by Clicking on the Map:*
  This tool will allow users to obtain the latitude and longitude values of a specific location by clicking on the map.

- ✓ *Query Builder Tool:*
  The Query Builder tool will enable users to define specific search criteria and filters to obtain relevant information from the database. Users can create custom queries based on attributes like pipeline material, size, proximity to landmarks, etc.

- ✓ *Search Criteria:*
  Users can input search criteria such as pipeline ID, location name, landmark type, or any other relevant parameter to quickly find specific information on the map.

- ✓ *Buffer Region:*

The Buffer Region tool will enable users to create a buffer around a selected point, line, or area on the map. This feature will help identify and display landmarks and buildings within a specified distance from the pipeline network. Also give counts of Pipeline length, number of each fittings / assets installed.

✓ *Map Printing and Export:*

Users will have the option to print the map view or export it as a PDF or JPG file for offline use or sharing with other stakeholders.

✓ *Locating Asset by Entering Latitude/Longitude Values:*

Users can enter latitude and longitude values to locate assets or specific points on the map.

✓ *Displaying Pipeline and ROW/ROU Information on open-source Imagery google earth imagery with API and Maps:*

The application will overlay pipeline and Right-of-Way (ROW)/Right-of-Use (ROU) information on top of maps from various sources such as Open-Street Maps or similar. This will provide a visual representation of the pipeline network in its geographic context.

Task Creation and Field Data Approval Module:

- Job/Task can be created from the system based on defined activity.
- Assigning a task to a field staff/construction contractor should be done from the application.
- Stretch wise information and name of patrolling staff should be stored in the system and selecting of drop-down menu, the name will be appeared.
- This module should help the admin to know the exact real time scenario of the field data, time to time updates about the pipeline data, location and O&M activity.
- All pending inspection/ O&M activity report list with basic details must be shown in a single window.
- User must be capable to View the photographs and data sent by field officials during inspection/O&M activity.
- User should able to view the details of inspection data. Like Inspection date/time, location, form details and the inspection officer's name etc.
- User should be able to give approval or rejection and special note based on the submitted inspection/O&M data

Task Create:

The task creation form should be the starting point for adding new tasks to the system. Through this module, user can create different tasks with a unique system generated Task ID.

- User must create a Task Name related to the subject.
- User will be able to provide a brief description of the task to be performed or any specific details or requirements for the task.
- User needs to enter Chainage details or relevant information about the location or position of the task.
- User should be able to provide the name of the location where the task was performed
- With the help of this module, User can also type the name of Station if any.

Task List:

After tasks are created, it should be listed in a tabular view within the module. The list must include columns for the relevant information, such as Task Name/Title, Pipeline Inspector, Supervisor, contractor name, Location Name, Station, Chainage, and Task Status.

- The task list view should provide options to filter and sort tasks based on various criteria, such as assigned Pipeline Manager, Supervisor, Task Status, etc. This will help users quickly find specific tasks or prioritize their work.
- Authorized users, such as supervisors, can assign tasks to Pipeline Inspectors directly from the task list view. They should be able to select a task, choose the appropriate inspector from a list, and set a due date for completion.
- In this listing page, user may search name of all Tasks by providing name of Supervisor.
- User should be able to filter any Task by Location details or pipeline inspectors.
- Clicking on a specific task in the task list view should open a detailed view of the task, showing all the input fields and additional information. This view should allow users to review the task's description, assigned inspector, supervisor, location, station, chainage, and any uploaded photos.
- Below is the sample task list:
  - Customer Registration
  - Meter Replacement
  - New Meter Installation
  - Route Diversion
  - Excavation
  - Incremental Changes in Network
  - Station wise Installation etc.

Task Assign:

This module must handle the task assignment process. Once a task is created using the form, it should be listed in the task assignment module.

- User can select the name of pipeline supervisor who conducted the observation (Select from a list of available supervisors).
- The pipeline supervisor will have access to this module and can review the tasks awaiting assignment.
- They can select a task and assign it to the appropriate pipeline inspector, name of the person responsible for executing the task (Select from a list of available inspectors).
- In this page, user can assign different types of Tasks to different pipeline inspectors.
- User can enter start date and end date of a particular task.
- The supervisor can also set a due date for the task's completion.
- Once the task is assigned, the pipeline inspector must be notified through the system.
- Once the assigning task is approved, it should mark as "Approved" in the system.
- By implementing a task management module with the specified input fields and functionality, user can streamline task assignments, improve collaboration between team members, and maintain relevant documentation, for each task.

Task Reporting:

- In web application, through this module user should be able to view the whole list of reporting against tasks which is entered already through Mobile Application.

- In this page user must be able to view all details and descriptions of any particular Reporting against a task.
- Whenever the assigned pipeline inspector should be able to update the task's status as they progress by the mobile application, user will view the current status of the task (The available task status could include: 'Not Started', 'In Progress', 'On Hold', 'Completed').
- Once the task is completed, the pipeline inspector should mark it as "Completed" (With the help of mobile application).
- The system should send notifications to the respective pipeline inspectors and supervisors when a task is assigned, updated, or completed.
- The supervisor must review the task and ensure it meets the required standards and expectations. If necessary, they can provide feedback or request revisions.
- User should be able to view all observation/findings including photographs.
- User should be able to view the date when the observation took place

Incident Management Module:

- Facility/asset-wise special incident data should be visualized on a GIS map
- History incidents should be stored in the module for further guidance to the employee
- This module should show the incident information like leakage, equipment failure, damage by third party etc.
- Facility to approve incident inspection data after resolution should be there in the system.
- Incident-wise Job creation and assignment of Job to the area wise patrolling staff.

Incident Reporting:

The Incident Reporting System must be a standalone application accessible to pipeline inspectors. It should facilitate the reporting of incidents and support photo uploads for additional evidence. Supervisors must have access to review and respond to reported incidents.

- The system shall store and manage incident data securely.
- Incident data shall be time stamped upon submission by mobile application.
- The system shall allow supervisors to access and review reported incidents.

Incident Listing:

- In web application with the help of this module, user can able to view the all list of incidents which are entered already through Mobile Application.
- In this listing page, user will search any incident with chainage details, location of the incident, Name of reporting Pipeline Inspector & name of supervisor.
- User must be able to view the category of Incident, date of incident, Type of Incident and the specific observations or findings made during the inspection with photographs which are already entered by inspector through mobile application.

Incident Update:

The Incident Update Module must be an integrated part of the existing Incident Reporting System. It will enable pipeline inspectors to provide updates on reported incidents and log actions taken to address them. Supervisors will have access to review and respond to the incident updates.

- In web application, with the help of this module user can update or edit any incident records.
- User should update chainage details, location of the incident, Name of reporting Pipeline Inspector & name of supervisor.
- User can add or edit any specific observations or findings made during the inspection with photographs and description of incidents.
- User must be able to view the date when the observation took place.
- There should be an option to select 'Incident category' from the drop-down list. The items listed in drop down list are 'Injury to personnel', 'Damage of Equipment', 'Gas Leakage' and 'Others'. User will select any of them from drop-down list.
- There should be another option to choose 'Type of Incident' from the drop-down list which consists of 'Major', 'Minor' and 'Near Miss'. In that case User will have to select one option from drop down menu.
- User can enter his/her comments and suggestions regarding the incident in 'Remarks' field with what kind of action has been taken.
- The module should store and manage incident update data securely.
- Incident update data should be time stamped upon submission.
- The module should allow pipeline inspectors to view photographs/images related to the incident update.
- The module should allow dedicated mechanism for broadcasting of information to the incident update.
- The GPS coordinate of incident must be captured when reported by HPOIL officers through mobile app.
- The incident must be automatically mapped on Web GIS and Mobile GIS, so as to get shortest route to reach the incident location.
- Pre configured incident mitigation steps must be visible to the Maintenance/repair staff mobile app, so as to submit the status at each stage of mitigation.

<u>Field/Patrolling Staff Activity Tracking Module:</u>

- A Web based Tracking module should be implemented from where HQ official can track the following:
  - Track the Live location of all staff
  - Track the travel Path individually
  - Track the location of any mishap with a photograph
- The Admin Officer shall be able to register the mobile users based on Name, Mobile Number and Photograph and assign the user as Patrolling staff.
- The application shall provide real time report of the movement of the GPS devices on the map to the web users based on their privileges.
- Functionality & Tools for controlling officer to assign a pipeline section to a particular patrolling staff.
- Ability to create Patrolling Task - Define Pipeline section to be patrolled.
- Assign Created task to a particular patrolling staff on a particular date/schedule etc.

- The user shall be able to view the nearby available staff from a particular location of the stretch.
- The application shall have to be in real-time sync with the central server and the mobile applications.
- The system should automatically refresh in short periodic intervals.
- Recording of Idling & Stoppages.

Patrolling:

Pipeline patrolling modules refer to the various components or technologies used for monitoring and inspecting pipelines. These modules are designed to ensure the safety, integrity, and efficiency of pipeline operations.

- In web application, through this module user can view the patrolling report of pipelines crossing like canal, main road, highway, railway which are entered already through Mobile Application.
- User shall view the detail records of date of patrolling, details of pipeline section, Network/Area, Size & Length of pipeline, Name of walker with photograph.
- User can view location wise some observations based on different check points (i.e. Excavation Work on/Near Gas Pipeline, Civil/Construction work on/Near Gas Pipeline, Erosion Soil, Encroachment, Surface subsidence (Flooding), any other potential hazard, Damage of OFC Chamber) day-to-day.
- User shall be able to trace the current status & condition of different Marker Posts/Boards (i.e. TLP Box, Warning Sign post, Boundary Marker, KM Post, Aerial Marker, Vent Line etc.) routinely.
- In this application, user will tracking the condition of pipelines on Road Crossing, Rail Crossing, River/Nallah/Pond crossing areas. User can view the status of crossing areas briefly.
- User will trace the all observations/findings of patrolling inspector regarding any suspected gas leakage, change in soil/crop colour, suspected movement of personnel/equipment nearby ROU etc, different location wise.
- User can view patrolling related any check list including comments & suggestions of reporting inspector.
- User can also view the comments & suggestions of Supervisor on check list forwarded by inspector.

Network Tracing Management Tool

- User should be able to trace the network using "Stream Analysis" and "Network Tracing" tool.
- Stream analysis shall be initiated by selecting any of the facility/asset of the entire network which is logically connected.
- Upstream or Downstream analysis should be the two option to visualize the network loop from the location of selected asset either to the source or to the last point of the network. i.e; SR/TLP's/Consumer meter based on the available GIS data and connectivity.
- After initiation of analysis the network loop should change into a different color for better identification.
- Network tracing tool should help the user to identify the network which is a connected network and which is a broken network.

Admin & User Management

- The user management module should be present for complete system handling along with the permission role management of every user of the web application. The functions of this module shall be as follows:
  - Manage mobile users.
  - Manage web users.
  - Manage role and permission of the mobile users.
  - Manage role and permission of the web users.
  - User can manage their own profile.
  - Change password option for the user.

User Characteristics

There shall be different types of users interacting with the Web Application & Mobile application. There are single users or a group of users with specific roles.

Super admin should have the right to change the access of a concerned user in accordance with the roles and responsibility of the user, in line with the approval from the management.

The initial list of the users / user groups should be: (the users / user groups will be finalized as the software concludes)

- **Level 0**

  Level 0 especially IT of the System shall have complete authority of the system and shall be able to make any changes to the system at any point of time. They can edit any data which may be restricted to other users. Level 0 shall be responsible for User creation, Layer Viewing, Layer Edit, Task creation, All Approval and Role assignment also.

- **Level 1**

  Level 1 shall be responsible for Layer Viewing, Layer Edit (only the concerned personnel), Task creation, Selected Approval and Data Entry.

- **Level 2**

  Level 2 shall be responsible for Layer Viewing, Layer Edit (only the concerned personnel), Task creation and Data Entry.

- **Level 3**

  Level 3 shall be responsible for Layer Viewing and Data Entry.

User Management:

The Web-Based Application must include functionalities that allow the Admin Officer to register mobile users and assign them as field staff. The registration process shall involve collecting essential information about the mobile users, such as Name, Mobile Number, and assigning them specific roles. Here's a detailed specification:

User Registration Form:

The Admin Officer shall have access to a user registration form where they can input the following details for each mobile user:

- ✓ Name: Full name of the user.

- ✓ Mobile Number: Contact number of the user (to be used for communication and login purposes).

- ✓ Validation and Error Handling:
  The registration form should include validation checks to ensure that required fields (Name, Mobile Number) are filled, and the mobile number is in a valid format.
  Appropriate error messages should be displayed if any required field is missing or if there are validation errors.

- ✓ Mobile User Database:
  The application shall maintain a database to store the registered mobile users' information, including their Name, Mobile Number.

- ✓ User Role Assignment:
  The Admin Officer should have the authority to assign specific roles to the registered mobile users. In this case, the role assigned shall be "Field staff."

- ✓ User Authentication:
  Once registered, each mobile user should receive login credentials (username and password) or a unique authentication token to access the application securely.

- ✓ Edit and Delete User Profiles:
  The Admin Officer should have the option to edit user profiles in case of any changes to Name, Mobile Number. They should also be able to delete user profiles if necessary.

- ✓ Data Privacy and Security:
  The application shall implement robust data security measures to protect sensitive user information, adhering to privacy regulations and best practices.

- ✓ Push Notification to Mobile Users:
  Upon successful assignment as field staff, mobile users should be notified about their roles and provided with necessary instructions for using the application.

- ✓ User Listing and Search:
  The application should offer a user listing view, where the Admin Officer can see all registered mobile users along with their assigned roles.
  A search functionality should be available to quickly find specific mobile users based on their Name or Mobile Number.

- ✓ Mobile User Registration Limit:
  The Admin Officer may be able to set a limit on the number of mobile users that can be registered as field staff, depending on the organization's requirements.

- ✓ User Activity Logging:
  The application may log user registration and role assignment activities for auditing and tracking purposes.

- ✓ User Registration Reports:
  The application may include reporting features to generate reports related to user registration, showing the list of registered mobile users, their roles, and timestamps of registration.

With the help of this module Admin user must be able to view the User List which contains the necessary information about user i.e., User id, Full Name and Contact Number. Admin User should be able to add new users in the user list. This module also provides the option to change the status of user. This Module also describes the role of each user and their area of access and rights.

- Web user shall create, edit or delete by admin user.
- Mobile user shall create, edit or delete by admin user.
- Admin user shall update the user details when necessary.
- Dynamic filtering of user is possible.
- User can update or change own profile password.

Mobile Application Basic Features:

The Mobile App should be a Native App, i.e; this application has to be implemented in compatibility to Android and iOS Platform. The Mobile App must run on latest Smartphones and tablets.

- Mobile app should be able to run on low bandwidth (minimum on 4G)
- There would be separate login id and password for every user to enter into the application.
- Each Device, on which the mobile app will be used, will have to be registered (using IMEI number) with the mobile platform web component.
- Each time the Mobile App is opened/accessed, it should check whether the device is registered or not.
- Role based access should be given to the mobile user by the Admin.
- Application should capable to send data online to the web portal directly through GPRS, i.e; Real-time connectivity to the central servers should be there.
- Authorized user should able to view the map of the command area/AOI, facilities and attribute details etc.

<u>Mobile app for Inspection and O&M Data collection</u>

- Assigned job should be viewable from the field staff mobile application.
- Routing to the job location from the mobile application should be performed.
- Separate forms should be created for Inspection and O&M Data collection.
- The field officials may use their own android smart phones and installed the mobile application which will enable them to collect the latitude longitude of the place of incident and O&M activity and its attributes, based on pre-defined form.
- Activity should be closed by field official after completing the inspection.
- Alteration of pipeline network, new pipeline network and other facility survey and mapping should be done from the mobile application.
- User must be able to plot different facilities/installations of pipeline on the map and submit attribute information accordingly.
- Mobile user can select the stretch within the jurisdiction and previously assigned to him/her.
- User should capture the image only as there will be no option to upload any image from the gallery.
- User can also capture small videos through this app and update it into the system.

- The mobile application consists of a login and password with fingerprint authentication after that the users can login in the mobile app.
- There should be separate login id and password for every user to enter into the application.
- Application should have the facility to authenticate with pin code and fingerprint.
- Application should have the facility to sync the Stations and pipeline data with the server.
- After syncing with the stations and pipeline details with graphical view will be displayed on the dashboard.
- Users shall have to select that particular stations and pipeline.
- After clicking on map view page will open. In this page users can see these options i.e., current location, station's location, installed asset, pipeline connectivity map location and save button.
- After clicking on the particular asset on map page, a form page will open where they can fill all the necessary details and can and there is a provision of taking picture of asset. Finally click on the submit button to save the data.
- After clicking on the save button, user shall have to come again on the sync the data with server option and click on the upload button which they can upload the details in the server and view the whole details on the web application.
- In the mobile app a provision to store all the patrolling data in offline mode during lack of internet connection.
- In this module, users should be able plot the new/updated facility installations related to CGS, DRS, MRS, CNG stations and pipeline data. User should be able to visualize the data on the map view page by clicking on the asset icon.
- Cathodic Protection Data Collection
- Service Regulator Maintenance
- Gas Leak Reporting
- Incident Reporting
- Pressure monitoring

Patrolling Mobile Application:

The application features for a patrolman bike tracking for gas pipelines should be designed to ensure the safety and security of the pipeline infrastructure, as well as the personnel shall responsible for its maintenance and protection. Here are some key features of the solution:

- The application must provide real-time GPS tracking of the patrolman's bike, allowing the user to monitor its location and movement at all times through asset management dashboard.
- Complete travel path of individual patrolling staff to be visualized through the portal. Indication of "Halt Location", "Excavation Site" with separate color coding on the map.
- Geo-fencing features should allow the user to create virtual boundaries within allocated corridor and sensitive pipeline sections or restricted zones. If the patrolman's bike enters or leaves these boundaries, an alert would be triggered.
- By using of mobile app, the patrolman should be able to report incidents such as leaks, vandalism, or unauthorized access/digging. These reports will include details such as the location, time, and nature of the incident, as well as any relevant photos or videos. The reporting details should be shown in the control centre dashboard as an immediate intimation.

- In the event of an emergency, the system shall quickly alert/notification the supervisor and provide the patrolman's location, allowing for a rapid response.
- The solution should analyse patrol data to identify patterns or trends that may indicate potential issues with the pipeline, allowing for proactive maintenance and risk mitigation.
- Integrated mobile app should allow the patrolman to access key features such as incident reporting, route planning, and communication with the asset management system from their smartphone or tablet.
- User should also be able to download the full report in the form of excel format.
- User shall also be able to search a particular patrolman from the list page under the search text box.
- In this module, officials shall also be able select the various type of incident from the drop-down menu and the location of all history incident would be plotted on the map.
- Also, user must be able to do proximity analysis based on historical data.
- By clicking on the particular incident icon on the map, new window should open, users shall be able to view the detailed description of the incident along with the date.
- Corridor/sub corridor wise observation and excavation report must be be submitted using mobile app.

All the above-mentioned modules and features shall be customizable as per HOGPL's requirement.

Training & Support

Training:

The aim of this project is to give stakeholders the capacity and knowledge to guide all aspects of the application in future. Therefore, the training elements of this project are a vital aspect.

General approach to training:

- In all cases the relevant key experts and supporting experts should develop the training materials depending on the subject technical area.
- The specialist trainer shall review and enhance the materials so that they shall be as clear as is possible to those receiving the training.
- Structured feedback from the trainees shall be sought for all training sessions so that materials can be further improved.
- Total 3 days onsite training program must be provided at all 3 (Three GA's).
- Training Requirements are as follows:
  - Day 1: Classroom training for HOGPL, TPI's, and vendors
  - Day 2 & 3: On-field demonstration and application walkthrough
- Contractor must provide online training in case-to-case basis during support period.

Support:

On-call support should be provided after go-live of both the web and mobile app for 5 years.

Annual Maintenance Contract (AMC) of the Application:

- 5 years Annual maintenance of the application after go-live. The core web portal including the mobile applications may come with yearly maintenance immediate after the day of Go Live (initial one years included in software cost i.e. line item no. 1)

- The maintenance may primarily long-distance maintenance from contractor's offices through VPN or remote access to the server. In-case of any issue arise during AMC.
- Provision of telephonic support and support over the web for the maintenance of existing modules. The Annual Maintenance includes the followings:
  - Remote Technical Support via email, phone, and fax
  - System Support Maintenance
  - Re-installation of the software remotely
  - Software Bug fixing
  - Trouble Shooting
  - Support for updating various pipeline associated assets i.e. valve chambers, Service regulators, CNG Equipment's etc in the GIS Solution

Schedule Management Plan:

Project schedules for the application implementation should start with the deliverable identified in the project's Work Breakdown Structure (WBS). Activity definition shall identify the specific work packages which must be performed to complete each deliverable. Activity sequencing shall be used to determine the order of work packages and assign relationships between project activities. Activity duration estimating should be used to calculate the number of work periods required to complete work packages. Resource estimating should be used to assign resources to work packages to complete schedule implementation.

Once a preliminary schedule has been developed, it must be reviewed by the project team and any resources tentatively assigned to project tasks. The project team and resources must agree to the proposed work package assignments, duration, and schedule. Once this is achieved the Department will review and approve the schedule and it will then be baselined.

The following will be designated as milestones for all project schedules:

- Project kick-off meeting should be signed off with the concern of EIC HOGPL and Contractor both.
- System Requirement Specification (SRS) must be signed off with the concern of EIC and Contractor.
- Completion of scope statement and project schedule and an approval must be taken from HOGPL.
- Hosting of application on HPOIL Cloud Server and User Acceptance Test (UAT) of the final deliverable should be signed off by the HOGPL and Contractor both
- Finally Go-live of the application shall be done in the presence of HOGPL and Contractor.

Quality Management Plan:

All project team members from the contractor will play a role in quality management, it is imperative that the team ensures that work is completed at an adequate level of quality from individual work packages to the final project deliverable. The following are the quality roles and responsibilities for this Project:

Contractor shall maintain files of the Project Plan, associated documentation, including individual responsibilities, deliverables, schedules etc. M/s HOGPL will be responsible for approving all quality standards for this Project. The department will review all project tasks and deliverables to ensure compliance with established and approved quality standards. Additionally, HOGPL will sign off on the final acceptance (UAT) of the project deliverable.

The Project Manager of the contractor shall be responsible for quality management throughout the duration of the project. The Project Manager shall be responsible for

implementing the Quality Management Plan and ensuring all tasks, processes, and documentation are compliant with the plan. The Project Manager should work with the project's testing specialists to establish acceptable quality standards. The Project Manager should also be responsible for communicating and tracking all quality standards to the project team and stakeholders.

The Quality Specialists will be responsible for working with the Project Manager to develop and implement the Quality Management Plan. The Quality Specialists will create and maintain Quality Control and Assurance Logs throughout the project.

The remaining members of the project team, as well as the stakeholders, will be responsible for assisting the Project Manager and Quality Specialists in the establishment of acceptable quality standards. They will also work to ensure that all quality standards are met and communicate any concerns regarding quality to the Project Manager.

Data Security:

The Application should be focused on Data Security for the following threats.

- Injection
- Broken Authentication and Session Management
- Cross-Site Scripting (XSS)
- Insecure Direct Object References
- Security Mis-configuration
- Sensitive Data Exposure
- Missing Function Level Access Control
- Cross-Site Request Forgery (CSRF)
- Using Components with Known Vulnerabilities
- Invalid Redirects and Forwards

4 Penalty Clauses

a) During the implementation period, vendors must adhere to the timeline/schedule mentioned in the RFP. Failure to comply shall also attract a penalty of ₹15,000 per week for delay.

b) For existing GIS data migration of Steel, MDPE, CGS & CNG Stations using GIS database provided by HOGPL and publishing on Web GIS - Migration is to be completed within 30 days of data availability. Delays shall attract a penalty of ₹15000 per week.

c) Delay in plotting pipeline network shall attract a penalty of ₹5000 per week.

4.1 The Asset Management Application shall be capable of integrating with various tracking devices to ensure that Steel and MDPE pipeline patrolling personnel remain within the designated geo-fencing area. The application shall generate alarms in case of any deviation from the geo-fenced boundary, and such alarms shall require acknowledgment by the concerned officer.

Additionally, the application shall enable patrolling personnel to report any field observations—such as excavation or potential threats—along with geo-tagged photographs. All such reports shall be systematically recorded in the application and shall require acknowledgment and necessary action by the designated officer.

4.2 Data porting/loading to Software shall be completed weekly. Data provided during 7 (seven) days, shall not be left unattended in 7th day. The work shall be done remotely.

5. MANPOWER RESOURCES

5.1 THE REMOTE MANPOWER REQUIREMENT FOR THE PROJECT EXECUTION PHASE WILL BE AS BELOW-

S.no	Position Details	Qualification & Experience	Nos	Period	Location of Deployment
1	Team Leader Cum GIS based Software Development expert	BTech/M. Tech in IT/Computer Science or equivalent with the experience of GIS based software development for at least 15 years	1	For Duration of Project	Remote. (CV to be submitted by the Bidder)
2	Software Developer Cum Asset Management Solution Expert	BTech computer/MCA/M. Tech or equivalent with the experience of development of Asset Management Solution using GIS API's development for at least 10 years Experience of Implementation of large-scale GIS project and Integration with other system such as ERP, SCADA/CRM/ SRM etc. with minimum 5 years of experience	3	For Duration of Project	Remote. (CV to be submitted by the Bidder)
3	Draftsman	Graduate with the experience of plotting network using autocad/As-built drawings for at least 5 years	-	As & When required Basis	Remote. (CV to be submitted by the Bidder)

The Manpower can be increased as per the requirement.

Note: CVs of all the Key personnel (S.No.1, 2,3) to be submitted as per Annexure-I

The selected agency shall not change the Key personnel whose CVs have been given in the proposal in case of any change which is beyond the control of the company and is inevitable, the same will require prior written intimation and consent of the Client.

6. SCOPE OF SUPPLY

HOGPL shall only provide cloud server space for hosting of the application. Bidder must recommend required server specification before Go-live of the application.

HOGPL shall not supply any other material, manpower or equipment for the tendered work. The procurement and mobilization / supply in sequence and at appropriate time of all equipment, data, skills, accessories, materials, software, and consumables etc. required for completion of all works covered under this contract shall be entirely the responsibility of the Contractor.

7. TIMELINE/TIME SCHEDULE:

- supply & implementation of Web & Mobile app based GIS based CGD Planning, Operation & Maintenance Management system Application UAT (User Acceptance Test)

must be completed within 3 (three) month after issuing agreement/purchase order/work order.

- Annual Maintenance Contract (AMC) of the application must be for 5 (Five) years (First initial year AMC cost included in Software cost i.e line-item no. 1 and remaining four-years cost payable through line-item no. 4) immediate after Go-live.

8. PAYMENT SCHEDULE:

Sl. No.	Particulars	As per SCHEDULE OF QUANTITIES (SOQ)
1. For SOR Line Item 1: Supply and Implementation of supply & implementation of Web & Mobile app-based GIS based CGD Planning, Operation & Maintenance Management system for Three Geographical Areas of HPOIL Gas CGD Network with one year AMC through remote support including 5 (five) Days training provided to the users in all 3 GA'S of HPOIL Gas for effective use of the solution.		
a)	System Requirement Specification (SRS) Sign-off.	25% Payment will be made after SRS Sign-off against SOR Nos. 1
b)	User Acceptance Test (UAT) Sign-off	40% Payment will be made after UAT Sign-off against SOR Nos. 1
c)	Go-Live of the Solution	25% Payment will be made after Go-Live against SOR Nos. 1
d)	End of bundled 1 year AMC	10% Payment will be made after end of initial one year AMC, i.e. 1 year after date of Go Live.
2. For SOR Line Item 2: Integration/Migration of existing GIS database of pipeline network for Steel and MDPE along with associated facilities for 3 (Three) GAs which are to be migrated and porting to the GIS.		
a)	Migration of Existing GIS Database	100% payment will be made after complete data migration and approval from EIC.
3. For SOR Line Item 3: One time Security Audit of the Application by Cert-In certified vendor before Go-Live of the application.		
b)	One time Security Audit of the Application by Cert-In certified vendor	100% payment will be made after submission of Security Audit Report
4. For SOR Line Item 4: AMC : Remote Software maintenance support, development & service cost including support for updating various pipeline associated assets i.e. valve chambers, Service regulators, CNG Equipment's etc in the GIS Solution after Go-Live (from the date of end of initial 1 year AMC included in line item 1).		
a)	Annual Maintenance Contract	100 % Monthly Payment will be made after every month against SOR Item No. 4
5. For SOR Line Item 5: Remote Manpower Support for Manual Digitization of Steel & MDPE Pipeline Network from existing As-Build Drawing (ABD)/ Autocad files and Integration with GIS based CGD Planning, Operation & Maintenance Management system.		
a)	Manual Digitization of Steel & MDPE Pipeline Network	100% payment will be made after network plotting in GIS Application and approval from EIC.

9. OTHERS

- Vender will be responsible for connecting the software & solutions as mentioned above in hardware which is used for web GIS system at HOGPL.
- Traveling, Boarding and lodging for all its personnel deployed for the execution of the work is to be arranged by the bidder.
- Right of access to HOGPL or its representative for audit of the quality and accuracy of work done.

- The integrity and confidentiality of the HOGPL information assets are to be maintained by the bidder. And successful bidders is required to sign the nondisclosure agreement with HOGPL after award of job.

- For any third-party services like payment gateway, SMS packages, SIM Card, Mobile Phone, Computer System, Google API services for route tracking, route finding, monitoring of patrolling team etc. the cost would borne by the successful bidder.

- HOGPL will provide cloud storage for installation of software. However, vender has to coordinate & guide to cloud vender for installation, commissioning of hardware & make system compatible with GIS software & system.

- Installation of the software should be done free of cost at HOGPL's premises. The system developed should be Web Based & Network compatible and should also be suitable for continuous updation/ alterations etc. by the Owner. The contractor will install the total system in the owner's server & ensure efficient working to the satisfaction of Engineer-In-Charge.

- The vender warrants that the goods supplied under the agreement are new, unused, of the most recent or current models and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract documents. The supplier further warrants that all goods supplied under this agreement shall have no defect, arising from design, materials, or workmanship (except when the design and / or material is required by the purchaser's specifications and the supplier has given his disclaimer of warranty obligations with respect to such requirement) or from any act or omission of the supplier, that may develop under normal use of the supplied.

10. HANDOVER

- Continuity and performance of the services at all times including the duration of the agreement and post expiry of the agreement is a critical requirement of the HOGPL. It is the prime responsibility of the successful bidder to ensure continuity of service at all times of the Agreement including exit management period and in no way any facility /service shall be affected / degraded. Further, the successful bidder is also responsible for all activities required to train and transfer the knowledge to the HOGPL to ensure similar continuity and performance of the services post expiry of the agreement.

- At the end of the contract period or upon termination of contract, the successful bidder is required to provide necessary handholding and transition support to ensure continuity and performance.

- The successful bidder shall not delete any data at the end of the agreement (for a maximum of 60 days beyond the expiry of the agreement) without the approval of the HOGPL. Further the bidder shall facilitate the DBMS to new contractor at the end of the contractual period. The successful bidder has to ensure that data is not compromised during the exit process. Also, the successful bidder has to provide data in a reasonable format that is capable of being utilized by any new service provider.

- During the exit/transition management process, it is the responsibility of the successful bidder to address and rectify the problems with respect to migration of the applications and related IT infrastructure including installation / reinstallation of the system software etc.

- The ownership of the data generated upon usage of the system, at any point of time during the contract or expiry or termination of the contract, shall rest absolutely with HOGPL.

- During the contract period, the successful bidder shall ensure that all the documentation required by HOGPL for smooth transition including configuration documents are kept up to date and all such documentation is handed over to the purchaser during the exit management process.

11. DEFECT LIABILITY PERIOD OF WEB & MOBILE APPLICATION:

The Contractor warrants that the work carried out under the Agreement are meeting the requirement of the Bid document and will rectify/ resolve any defects on receipt of instructions from Owner/ Consultant.

The Owner shall promptly notify the Contractor in writing of any claims arising under this warranty, upon receipt of such notice the Contractor shall, within a reasonable period will resolve the issues/bugs, free of cost to the Owner. No claim whatsoever shall lie on the Owner thereafter.

The Defect liability period shall be 12 months from the date of Go Live. If the Contractor, having been notified, fails to remedy the defect(s) within a reasonable period, the Owner may proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which the Owner may have against the Contractor under the Agreement.

Annexure – I

CURRICULUM VITAE (CV)

Position Title and No.	
Name of Expert	
Date of Birth	
Country of Citizenship/Residence	

Education:

University/Institute	Degree	Year Joined	Year Completed

Employment record relevant to the assignment:

Period	Employing organization and your title/position. Contact information for references	Country	Summary of activities performed relevant to the Assignment

Membership in Professional Associations and Publications:

Language Skills (indicate only languages in which you can work):

Adequacy for the Assignment:

Detailed Tasks Assigned on Consultant's Team of Experts	Reference to Prior Work/Assignments that Best Illustrates Capability to Handle the Assigned Tasks