

מכרז פומבי מס' PD25001439 - נספח 6 – מפרטי טכני

Operational Information System Specification Request for Proposal Flow and Inventory Management System for fuel tanks and pipelines of PEI LTD

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1. Introduction

PEI requests a proposal for supply, design, installation, training and service for the Petroleum and Energy Infrastructure (PEI, "the company") fuel inventory management system.

This RFP objective is the execution of a complete project in accordance with the attached technical specifications and bill of quantities.

The document includes the system characterization, pilot phase definition and special technical specifications.

The inventory management system is required at each of the company's Tank farms and pipelines (approximately 24,000 cubic meters), managing the fuel inventory, flows and balances throughout PEI.

There are 8 Tank Farms consisting of 90 tanks, which include 3 main tank farms, 5 secondary tank farms and 2 control centers which manage the system.

The ability of the contractor to perform the project will be tested during a Pilot phase, where it will be required to perform all components of the system for two (2) Tank Farms. In favor of the Pilot phase, the contractor will be entitled to receive an agreed final sum of payment. In case the Pilot phase does not meet PEI requirements, the contractor win of the tender will be cancelled.

Section 2.2 in the technical specification describes the configuration of the tank farms.

The introduction includes the Definition of the work and Requirements from the bidder.

1.1 Definition of the work and requirements from the bidder

1.1.1 General

The purpose of the system is to enable continuous monitoring of the company's fuel inventory, sorted by fuel type and location, in each of the tank farms, and in the KAMAD lines.

The management will include the execution of balances, which will compare the quantity at any given moment to the quantity, at a given previous time, plus the quantity received, and minus the quantity supplied.

The intention is to manage the inventory separately in each of the tank farms, and in KAMAD, and to summarize the quantities of the company's inventory.

1.1.2 Inventory Management at the Tank Farm

At the tank farm, it is required to calculate the fuel inventory at the farm, sorted by fuel type, and perform an hourly/daily balance, which checks that the inventory at the beginning of the period, plus the inventory received at the farm, minus the inventory supplied from the farm, is equal to the inventory at the end of the period. The main amount of fuel at the farm is in fuel tanks, a small amount is in the pipe lines.

1.1.2.1 Inventory management in fuel tanks at a distillates tank farm

The tanks at the farm are fuel type dedicated, each tank contains a specific distillate. Therefore, it is possible to calculate the inventory of each type of distillate in the farm.

The inventory calculation is based on reading the quantity in the tanks, which is done through ENRAF CIU888 type hubs. The inventory in the tanks changes as a result of receiving fuel from fuel lines, or from marine vessels, or dispensing fuel to fuel pipe lines, to road tankers, or to designated pipe lines.

The company request is to:

- Perform an hourly/daily calculation of the total, sorted by type, amount of fuel in each tank, and on the entire farm.
- Perform an hourly/daily reading of the amount received/distributed from the farm using flow meters.
- Perform a balance of the amount at a previous point in time, plus the difference between the receipt, delivery of fuel from the farm and current amount.

1.1.2.2 Inventory management in crude fuel tanks

Crude fuel is stored at the Kiryat Haim terminal tank farm.

Inventory management in crude fuel requires reference to the type of fuel. A tabled list defines the types of crude fuel. At each tank intake, the volume and the type of fuel are updated, and accordingly the percentage distribution of each type of crude fuel in the tank.

Different types of fuel are mixed, in order to achieve a desired composition of fuel oil. The mixing is carried out by flowing between the tanks.

Generally, source tanks contain one type of raw fuel. For the purpose of delivering into the customer tank a predefined composition, the various types of fuel that will make up the required mixture at the end of the process are transferred to a mixture tank, that is used for pumping out the material into the customer tank.

It is required to calculate the stocks and types of fuel, and to perform balances that ensure that there are no unexplained shortages.

1.1.3 Calculating Line Inventory

Line inventory is included in two major types: inventory in national fuel pipeline of KAMAD, inventory in fuel lines that flow to/from marine vessels.

There are also inventory fuel lines within a farm, and inventory fuel in designated lines that flow specific fuel to specific defined customer, which is in the responsibility of the tank farm, (not the responsibility of KAMAD).

National Balance - To the extent that the Commerce Division deems it valuable to calculate the total inventory of the company, the quantities in the tank farms and the fuel at KAMAD can be combined into a total quantity of PEI, sorted by fuel type.

Fuel lines inside farms contain a known amount of fuel. The total volume of the lines could be considered as a tank, which at a starting point, contains defined quantities of each type of distillate. During flow, pushing one type of fuel with another can be calculated based on receiving tank level and volume of flow for marine lines, dedicated fuel type lines and tank farm internal lines.

1.1.3.1 Inventory Management on KAMAD Lines

The national lines contain fuel which connect 8 tank farms, two refineries, and several power generation stations. The lines are always full, except for specific cases where maintenance work is being carried out, or cases of malfunction. The specific cases will require individual manual handling.

The Company proposes to treat the KAMAD lines as a container with a known volume, which remains constant over time. It contains the three types of distillates existing in the company, in ratios that vary depending on the types of fuel being pumped, at a given time. The goal is to continuously monitor the quantity of each type of distillate, within the overall volume of the lines, at any given moment.

It is proposed to begin the calculation at a point in time, at which the quantities of each of the distillates within the KAMAD lines were accurately defined. Starting from that point in time, conduct measurements, using meters installed at the end of pipe lines, of the quantity and type of material entering or leaving at each end point, and thus constantly calculate the quantities of each of the distillates in KAMAD.

In addition, it is needed to perform a balance ensuring that all quantities that entered the system are equal to the quantities that left it. The system will allow for calculations to be performed at any specified time period, and at the beginning and end of each flow from/to KAMAD.

Providing managing fuel volume in KAMAD lines is subject to the bidder's capability and the Company's requests to use this capability, this is intended as an optional provision only, as implied by Section 13 of the proposal and the technical specifications

1.1.3.2 Flowing in marine lines

Marine lines are multi-product, and they are not completely packed at the end of the delivery. The work process is similar to the reception/discharge described for internal fuel lines in a farm.

1.1.3.3 Flowing through dedicated lines

The dedicated lines are always filled with one type of fuel. It is required that the line is fully packed at the end of each flow. When fully packed, the volume is known, and the given volume can be added to the total quantity on the farm.

2. General Characterization

PEI (the company) owns for many years a flow and tank data and inventory management system (ODM) based on Taylor Made software. The ODM software enables the inventory management and the execution of balances on inventories in tanks and pipelines, collects information on inventory of tanks from the central level measurement system, and flow data received from operational controllers via the SCADA system, as well as additional data that is manually defined by users in the system.

PEI is interested in replacing the system with dedicated software that will manage the inventory in each tank farm independently, will collect information from the tanks, will enable flow management in the operational system, and interface securely with the administrative system.

The intention is to use existing off-the-shelf software in the fuel sector, one that was developed for the international market, had undergone quality control and is used by a large number of customers. The software system should include build-in interfaces to existing measuring equipment on the market, issues updates periodically, and is supported by a large and stable backup company that can ensure the existence of several years of support.

In order to fit into the method of working in PEI, the system will allow also working in a way that does not comply with the CUSTODY TRANSFER settings.

The purpose of the system is to enable balances of quantities received from external suppliers (Refineries, EAPC, Marine Vessels), to compare them with the quantities supplied to customers, and to manage the differences in the stocks in tanks and in pipelines.

At any given moment, it will be possible to have a balance and ensure that no fuel loss occurs in the system. It will be possible to know the exact type of fuel for the stock in the tanks and in pipelines

The system is designed with degrees of freedom such as to allow for updating flow and level data manually and retrospectively.

An operational information system regarding fuel stocks in tanks and fuel flows is designed to manage flows to/from tanks, collect information, store information, manage process and retrieve information later in full or while performing various sections. All system data will be available in real time, the data can be changed and edited by system users before, during and after the flow is completed.

It will be possible to edit date data, parameters, quantities, association and grouping of flows, change the flow number, change the type of material in the flow, etc.

Historical data will be available for at least two years for immediate retrieval, and for at least 7 years in archiving.

The system will be built in a way that will allow redundancy for both operation from different locations, and redundancy in the event of a failure in any of the system components.

The system should be available to company employees 24 hours a day, 365 days a year, with hot backup option.

The users of the information and management system according to permission level ranking are:

Viewer - Viewer of the system without permissions to make changes

Operator - Dispatchers can change values before approving them

Inventory Manager - Facility managers or those responsible for inventory management

National Manager - Inventory Manager level + access to editing customized reports and managing users

System - Those who perform system maintenance and updates.

At least 5 permission levels are defined

The main requirements for the system are:

1. Management of fuel flows, including full characterization of the flow (see details in the flow management section).
2. Displaying active flow data and active delivery data and comparing quantities
3. Displaying all streams in different categories
4. Collecting tank data from CIU facilities and displaying tank inventory data
5. Summary of the total amount of fuel of a given type in tank farms
6. Performing a balance on the amount of fuel at the beginning and end of the streaming
7. View, edit, and print reports of streaming data
8. Displaying laboratory data received via communication from laboratory in Prtrolium refineries, Petroleum Institute, Chemical testing laboratory or data manually entered into the system.
9. General settings including parameters, data to be transferred to the customer
10. Option to display meter data
11. Crude oil compositions relevant to some facilities (Terminal for example).
12. Notifications of abnormal data in the system, such as a request for streaming approval, lack of data in the shipment, data inconsistency, closing time/opening time
13. Flexible sorting and slicing options for displaying any data in the system
14. Ability to transfer information from the database or access the database for the purpose of transferring information to other systems
15. Comparing quantities between asource tank and a collection tank

The characterization defines a tool that retrieves and processes data from the field and from various systems, while constantly scanning, calculating, and monitoring.

A variety of screen displays are required for: Dynamic tank levels, tabulated data, density and temperature profiles for graphical trend analysis, tank reports and calculations.

Quantity management and reporting, and compliance with cybersecurity standards.

Accurate and secure inventory data at all times, including overfill warnings, leak detection and alerts to prevent or mitigate potential disasters, while protecting people and the tank farm environment.

The system will present real-time information in a clear and organized manner, with a tool that helps making operational decisions.

Accurate and reliable data delivered in the required formats is essential.

A variety of views will be available for inventory management, including but not limited to bar graphs, tabular data, tank icons, and a variety of optional modules such as trend analysis, report printing etc.

3. Configuration and Requirement Specification

3.1 Data

- The inventory management system should collect real-time information directly from the tank metering heads through ENRAF tank information Unit (CIU) which is the PEI company standard.
- System data must be available and reliable even in cases of communication failure in the national network.
- The system is required to allow the work also not according to the Custody Transfer settings, and enable manual completion of missing data including manual update of parameters, quantities, date and time if deliveries, delivery numbers.
- The system will allow for recording a single flow across multiple shipments, consolidating multiple shipments into a single master flow with automatic updating of physical properties of the selected shipment as the master shipments for all selected subshipments. (Example: A shipment is opened for material that is pushed into the pipeline at the beginning of the flow, an additional shipment is opened for the main contents of the flow, and a third shipment for pushing the pipeline .at the end of the flow Each such shipment receives a unique number, and then operator manually changes the number of all three to the same number).
- The system will also allow manual change of tank levels, amount of fuel in the pipeline before streaming, amount of fuel in the pipeline at the end of process, possibility of changing parameters depending on the material being flowed.
- The system is required to have the ability to receive manually laboratory data into designated field
- Ability to define vehicles for crude oil in tanks (required fro the Terminal facility).
- A meter reading capability is required

ENRAF CIU-888

CIU hubs in the company's tanks are ENRAF.

CIU Coordinator is a Communication Interface Unit that forms the central link between tank level measuring devices and control room systems. The system provides operators with reliable and accurate tank inventory data in real time, 24 hours a day, 7 days a week Continuously.

The CIU scans the data from the level gauges installed on the tanks. The level gauges measure the height of the product in the tank using a Radar or Servo Gauge, and also serve as data hubs for additional sensors such as temperature, pressure, and density.

The hub processes the data and calculates the standard inventory at 15 Degrees Celcius, after corrections for a "thin-walled tank" according to calibration tables, "floating roof", water level at the bottom, temperature, etc.

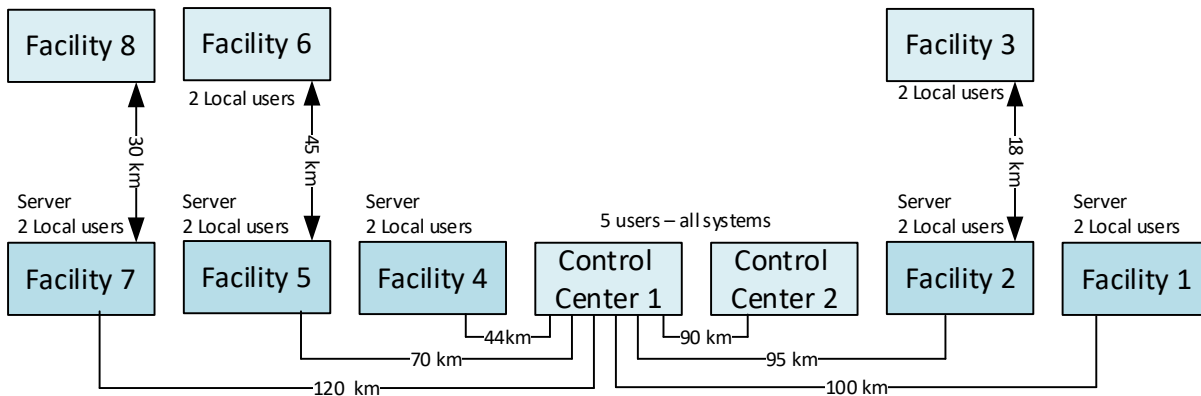
The CIU hubs are equipped with tank calibration tables, physical data of the roof, data reading from the measurement heads for level, temperature at 10 elevation points, and water level

Inventory calculations are made based on this data within the hub. The inventory management system is required to read the data from the hub, and process it into displays and reports that will be used by the company's operations and trading departments.

The inventory management system must connect to the CIU-888 with firmware version R120 and will also need to allow for updates to future versions without changing the configuration.

3.2 Operational Stations

The system will include user stations as detailed hereby:



- In each manned facility, that includes tanks, two users stations will be installed for the purpose of defining the flows and managing the inventory of that facility. There is a total of seven (7) manned facilities and one (1) unmanned, plus two control centers.
- Additional remote user stations will be installed at two (2) of the company's central sites, with access to data from all facilities. The information will be transferred over an operational network TCP/IT.
- The system will be connected to tanks in eight (8) facilities, with the possibility of expansion for additional tanks:
 - Facility 1 – 16 Tanks
 - Facility 2 – 20 Tanks
 - Facility 3 – 9 Tanks
 - Facility 4 – 26 Tanks
 - Facility 5 – 12 Tanks
 - Facility 6 – 5 Tanks
 - Facility 7 – 26 Tanks
 - Facility 8 – 2 Tanks

3.3 Software and Database Configuration

1. WINDOWS 10 AND WINDOWS 11 operating systems.
2. Preference for database based on SQL SERVER with the ability to perform queries on the database.
3. The system should include reporting tools, preferably SSRS

4. The system should include a system interface tool (API) in order to extract data from the system, or as a lower priority, the supplier will be required to develop a mechanism for extracting data according to the company's requirements.
5. The system will have a secure dedicated and intuitive interface, based on permission levels, to allow system administrators to manage and expand the database, add, edit, delete (Tanks, Valves, Materials etc.) independently, without the need for intervention of an implementer on behalf of the supplier. These changes will be documented in a change log mechanism.

3.4 Documentation and Training

The system will be provided with user manuals guiding for basic configuration and setup.

Training sessions will be conducted for system users. Implementation support will be included after installation at each facility.

The software vendor as part of the project scope will provide documentation as detailed below.

3.4.1 Documentation

Documentation will be received as part of the delivery contents:

- System description according to the project and details characterization
- System Configuration
- FDS – Functional Design Specification
- FAT – Factory Acceptance Test Procedure
- SAT – Site Acceptance Test Procedure
- Operation and maintenance manual, including user manual and installation guide

3.4.2 Training

Training courses will be held during the system acceptance test period, or any other time frame coordinated with the supplier:

- Operator training – one day per system.
Training will include system design principles, configuration, data entered into the system, data received from the system, user interface, performing updates
- Inventory managers training - two days.
Training will include system design principles, configuration, data entered into the system, data received from the system, user interface, performing updates, changes and maintenance.
- System Administrators training - the provider will detail the training course offered.
Training will include detailed system structure principles; complete training that includes all system functionality, fault analysis, system health status testing, how to make changes to the system data, trends, reports.

3.5 Upgrades, Technical support and Service, Warranty

The inventory management system that will be provided will include a project warranty period starting from the completion of site acceptance test (SAT) of the Pilot Project and until all sites of the system has been fully installed at PEI. Then, a support and service period will begin.

The hardware and software manufactured by the supplier will be in good working order and free from manufacturing defects during all project period after delivery to the site, as well as during the service and support period.

3.5.1 Upgrade of Hardware and Software

The supplier is responsible for up-to-date hardware and software upgrades at a level of N-1 (N - the latest hardware and software to the supplier) at any time throughout the service support and guarantee period. Hardware replacement and software upgrades will be performed on an ongoing basis by the supplier within the framework of the agreement and without additional consideration.

3.5.2 Warranty

The warranty includes periodic verification of data quality. The system will allow manual data entry for periods of malfunction or inaccurate data updated or read, and will also consider manual data entry for the purpose of performing calculations.

The supplier is responsible for the hardware and software components, and will be required to upgrade or replace in case of need according to the system's current status or in any case of a malfunction based on required service level.

The supplier will be required to maintain available backup equipment in Israel for immediate response in the event of hardware malfunction.

3.5.3 Technical Support and Service

The supplier will work to diagnose and repair the fault according to the following required service levels:

- **Critical Fault**
 - Definition: A bug that prevents streaming deliveries from being opened
 - Support hours: 24/7, every day of the week
 - Treatment begins within two (2) hours.
- **Norman Fault**
 - Definition: A fault that is not a critical fault
 - Support hours: Sunday- Thursday between 7:00 am and 5:00 pm Israel time
 - Treatment begins within six (6) hours.
- A professional technical team located in Israel will provide technical support and service, and in any case, where according to the company, the malfunction or service is required at the company's site, the service will be performed at PEI site.

4. Pilot project and Project Management

4.1 The Pilot Project

In order to demonstrate the capabilities to support the connection and reading of relevant data from CIU888 hubs, the bidder will be required to connect facilities as detailed in the bid documents to the CIU888 hubs. The connection will be performed by a vendor representative, who is a professional expert, with at least 3 years of experience in implementing inventory management systems of the winning bidder.

The vendor will be required to demonstrate inventory management, including: reading and creating trends of level, temperature, gross inventory, net inventory, alerts and morning inventory report.

The project will be carried out on a pilot system defined within the framework of this tender and at the discretion of the company after notification of the winner. As part of the pilot, the following will be required:

- 4.1.1 Connection to the CIU888 hubs. The bidder will be able to obtain details regarding the hardware and software available in the facility in order to carry out the pilot including the necessary preparations
- 4.1.2 Accompanying the offering representative throughout the installation and configuration of the inventory management system
- 4.1.3 A check that the system reads and calculates, at least, the following data: level temperature, density, calibration data for a thin-walled tank, floating roof data, gross volume, volume at 15°C. This should be from all tanks in the facility, correctly and completely.
- 4.1.4 Creation of inventory reports for a specified hour in the morning by the company, for each tank and farm, including sorting by fuel type.
- 4.1.5 Creating an interface for meter data, in order to display quantities received by the facility, and the quantities that were delivered from the facility to customers including

- for distribution, for the purpose of displaying and managing the balance of fuel receive and supply
- 4.1.6 Creating a fault report: Includes faults from the measurement system when reading data from the tank, and faults in the process.
- 4.1.7 Building main screens that describe the farm in an appropriate way and to the satisfaction of the company
- 4.1.8 Creating trends that describe the data, including inventory and temperature variability in tanks
- 4.1.9 Connecting the system to an additional station in the company's offices outside the facility
- 4.1.10 The interface works according to the settings in the Interface section between the inventory management system and the company's systems
- 4.1.11 Performing acceptance tests according to test documents prepared in coordination with the company
- 4.1.12 Running the system for 3 months

The pilot project will be completed within a maximum of 5 months. At the end of the period the entire system will be assembled, and will meet all the requirements described in the above sections. To the extent that the project is not completed within the defined timeframe this will be considered a fundamental breach of the agreement, and PEI will be entitled to cancel the agreement.

4.2 Project Management

4.2.1 Project Manager

The supplier will designate a project manager who will be responsible for managing on behalf of the supplier all phases of the project from the date an order will be delivered until the end of the warranty period for the system and transfer to support services. The project manager will have experience in at least 2 projects of a similar size and is well-versed in the proposed system. The project manager will be approved by the company prior to his appointment as project manager. The supplier will be required to present to the company the professional . experience of the project manager candidate.

4.2.2 Pilot and Pilot Management

Project management will commence with a pilot as detailed herein, at a location defined by the client. Following pilot approval, implementation will proceed to all remaining company sites. Each phase shall be supervised and controlled by the supplier's project manager and will be executed only upon formal approval of each step by the company. The implementation phases are detailed herein:

- A. Formulation of a comprehensive work plan, including a detailed Gantt chart for project implementation
- B. Preparation of Functional Design Specification (FDS) and supporting design documents

- C. Preparing a configuration diagram
- D. Preparing documents for testing
- E. FAT testing station (simulation)
- F. Acceptance test performance (FAT)
- G. On-site acceptance check performance (SAT)
- H. Operating a system on site
- I. Preparation of an operation and maintenance manual
- J. Training of operators and engineers
- K. Start of warranty period
- L. Start of service and support period

4.2.3 Factory acceptance test (**FAT**)

FAT execution process will be documented in accordance with a test document prepared by the supplier prior to the test. All defects will be corrected and, if necessary, an additional test will be performed to verify the implementation of all required repairs

The FAT will be performed according to a procedure determined by the supplier and approved by the company prior to performing the FAT. A system for performing the tests which includes software and hardware, will be installed in preparation for performing the tests.

The supplier will install the system simulation application as well as an image of measured values, the application server and the work console, so that a comprehensive test of all system components will be possible both in the FAT phase of the pilot and in the FAT phase of the project implementation in the company's facilities.

4.2.4 Site Acceptance Test (**SAT**)

SAT testing will be performed by the supplier at the PEI company's facilities, after all hardware and software installations have been performed in the field, all required gauges have been connected for display in the proposed system, and the required interfaces for control and communication equipment have been installed.

A prerequisite for performing SAT is that a FAT inspection has been performed and all subsequent corrections have been made, and the customer has given approval for the completion of the FAT.

The SAT will be performed according to a procedure determined by the supplier and approved by the company prior to performing the SAT. A system for performing the tests which includes software and hardware, will be installed in preparation for performing the tests.

5. Information security

The system will be installed as a closed system and disconnected from the internet.

5.1 Access permission

Permission in the system will be managed using a role-based access control (RBAC) system, which will clearly define the permissions and possible actions for each user according to their position in the organization. This solution will be integrated with advanced authentication protocols, including authentication MFA to ensure maximal security, and to be approved by the company.

- **Permissions setting process**
 - The management system will include a user friendly interface for setting customized permissions for each user.
 - Permissions will be granted based on role, and can be updated or changed as needed.
- **Documentation and access management**
 - Every attempt to access the system will be recorded in a central log system for control and audit purposes .
 - Alert messages regarding multiple unauthorized access attempts will be forwarded to information security team.
- **Permission levels**
 - Viewer : View only of :the system data, without the possibility of changing it Relevant inventory data, such as the status of the tanks and levels in real time
 - Operator : Viewer level + access to ongoing operations, including starting and stopping streams and manually updating shipping and tank.data
 - Inventory Manager : Operator level + approve data feeds and updates, such as updating system settings, changing periodic maintenance data, entering new inventory data, and correcting incorrect values when necessary. In addition inventory managers will be able to create new alerts based on changes in system configuration. . Access to edit customized reports
 - National Manager : Inventory Manager level + In addition, national managers will be able to make structural changes to the system, such as defining new processes or updating global parameters. A national inventory manager sees all facilities, an inventory manager sees only his facility
 - System Administrator Admin Performing maintenance and repairs to the information system software. As well as the ability to manage other users including adding, removing, or changing access permissions for existing users

5.2 Work Environment

- The supplier will make a testing environment available to the company for updates and developments, and for the purpose of troubleshooting and testing solutions without affecting the active system , prior to implementation in the production environment.

- A separate development environment with source code preservation is also preferred
- The supplier will maintain the code used by the company for at least one year and at least 3 versions back

5.3 Software updates

Software updates to the system will be performed in a controlled and secure manner to maintain the integrity of the system and data. Key aspects include:

- **Manual and Controlled Update** : Each update will be performed manually using only secure media, such as encrypted external drives. The process will be fully documented and will be performed under the supervision of authorized IT personnel only.
- **Maintenance and Update Cycles**: System updates shall be performed during pre-scheduled maintenance windows outside of critical operational hours. This approach is designed to eliminate downtime and prevent interference with ongoing operations
- **Pre-Update Testing** : Each software update will undergo a testing process in an isolated environment before being implemented in the production environment. The purpose of the testing is to verify compatibility and proper functioning of the system.
- **Version management** : Maintaining a history of system versions will allow you to revert to a previous version in the event of a problem or incompatibility.
- **Digital signatures** : Each update file will be digitally signed to ensure its authenticity and prevent the installation of fake or corrupted updates.
- **Update reports** : Produce a detailed update report that will include the new version, new features, fixed issues, and update status (success/failure).
- **Integration of update management tools** : Use of dedicated tools for managing and documenting updates, including the option for real-time monitoring of the update process.
- **Documenting actions** : All update steps will be documented for audit and control purposes.
- **Training and education** : Maintenance teams will receive dedicated training to perform and manage updates in a secure and efficient manner.

5.4 **Microsegmentation**

The systems that will be installed in the company's facilities will be separated from each other in a separate segment in order to limit communication according to specific protocols and services required for operation, and the ability to use intrusion detection and prevention systems (IDS/IPS) to identify abnormal activity. As a result, the systems must support a multi-segment environment that will allow, among other things

- Access between components based on predefined permissions.
- Create an IP-based access policy
- Constant monitoring of traffic between network segments to identify and document unauthorized access attempts.
- In emergency scenarios at certain facilities, access policies to certain sections can be disconnected or changed to protect critical information, without affecting the service of other systems at other facilities

5.5 **Security Tools**

To ensure system and data security in a closed environment, the system's workstations and servers will allow the installation of advanced tools and technologies, such as:

- Anti-Virus, XDR, EDR solutions on workstations and servers.
- Ability to transfer logs to information security management systems, such as SIEM (Security Information and Event Management) / SYSLOG.
- Data encryption: Using secure protocols such as SSL/TLS for internal communication.
- Strong authentication processes MFA for all system users.

5.6 **Monitoring and Alert**

- A. Through the system, the supplier will provide the company with a monitoring tool to oversee system performance. This tool will utilize automated features to identify and mitigate potential issues before they occur
- B. Maintenance Reports: The system shall enable the generation of periodic maintenance reports, providing detailed insights into system status, performance metrics, and any identified faults, along with their respective resolution status
- C. The system will issue alerts in the event of abnormal behavior, to identify faults and information security events.

5.7 **Setup and ongoing Support**

- A. The system shall be isolated from the Internet and restricted to internal access only, with no external connectivity outside the company's premises.
- B. System Installation: The system shall be installed at the company's premises by qualified experts designated by the winning bidder.
- C. Support and Maintenance: Support and service activities shall be conducted in coordination with company representatives, including provision for secure remote access if required

6. Backup and Restore

Backup and recovery management in the system will be carried out in a planned and secure manner to ensure data availability and rapid recovery in the event of a malfunction or loss of data.

Notifications, approvals and all tank information will be recorded and retained for future review and monitoring

The system will include tools that will allow for the analysis of historical trends (see Section 7 Reports/Screens).

Historical data will be available at least two years.

Historical data will be kept as an archive for at least 7 years.

- **Automatic backups:**
 - The system will allow automatic backup to be performed independently or by a third party at predefined times
 - The backup will include all system data, configuration settings, and activity logs.
- **Fast data recovery from backup:**
 - The system will allow the ability to quickly restore specific data or the entire system data depending on the user's needs.
 - The recovery process will be carried out through an intuitive, seamless user experience interface and under the supervision of authorized IT personnel only.
- **Historical documentation:**
 - Saving all actions taken in the system for monitoring and auditing (AUDITING LOG).

7. Flow Management

7.1 Activating Flow/Streaming

- Define the flow by selecting source and destination items: Tank, Pipeline, Flow meter, Marine vessel, number of sources or number of destinations.
- For each source/destination a definition will be made by an operator in a dedicated system screen:
 - Flow type: movement (Reception/Dispatch/Simultaneous Reception and Dispatch), Flushing, Pushing, Draining, Dispensing, Transfer between tanks.
 - Delivery Number: Automatically assigned by the system. The operator may change it.
 - Quantity setting: when the end of batch is reached, an alert will be generated.
 - Product definition
- Option to manually enter data (if missing or requires update):
 - Start time, End time (needed in the event that a stream must be opened retrospectively for reasons that prevented it from being defined in real time).
 - Tank Level
 - Temperature
 - Density
 - Water Level
- Flows versus Marine Vessels – enable fields for configuration and display in reports:
 - Name of Marine Vessel
 - Marine Vessel Captain's name
 - Appraiser name
- Raw Materials – enable to define composition of the product to be flowed when it is consisted of more than one raw material. The various components included in the shipment will be selected from a pre-defined database list.

Below is an example of shipment composition:

עריכת הרכבים

%	שם מוצר	קוד קצאא	קוד בז"ח
46.00	CPC BLEND	ספ	73
24.00	PATOS MARINZA	אלבני	121
20.00	GEISUM	cr133	173
10.00	DUSSAFU	cr118	157
100.00			

EXIT

7.2 Flow Process

- Operator types/selects free text related to required information to be recorded, description of data influencing the process as drainage, rain, customer receiving tank, send/receive tank (on balance) etc.
- Receiving real-time data of measurements and values:
 - Flow
 - Level
 - Temperature
 - Quantity
 - Density
- Receiving alerts from the system, processing alarm confirmation and documenting in history:
 - Direction of movement does not comply with selected action
 - Quantity is approaching target
 - Incorrect Level measurement value
 - Incorrect Temperature measurement value
 - Incorrect Density measurement value
 - Gap between the closing Level of an operation in a tank and the Level of the next operation.
 - Communication failure between the system and the tanks

7.3 End of Flow Process

The following operational screens will be available for the system users:

- Flow data screen allows for sorting between active flows, complete flows and approved flows.
- Tank detailed information screen will include data as Max. Tank volume, Tank Temperature etc.
- Facilitate Manual update of tanks data, system flows and data calculation:
 - Start Time
 - End Time
 - Level
 - Temperature
 - Density
 - Water Level
 - Practical Volume
 - Volume at standard conditions (15°C)
 - Mass
 - Product
- Facilitate combining of several flows into one stream/batch. From a selected list of streams, one will be defined as the primary, the other following flows will be assigned as "son" flows, and those will receive the data as material density etc. from the primary flow, so that

a re-calculation will be performed according to the updated values. This procedure is used for the purpose of a flow balance that includes the quantity in the pipeline if the pipe was filled with another material before the flow process.

- Allow for Streaming confirmation
- Display detailed composition of materials in a tank in volume/mass percentage (%), used for crude oil.

7.4 Streaming Confirmation

Permission required by system screens:

- Streaming Screen
 - Operator – Start and Stop
 - Facility Inventory Manager – Flow approval.
(Flow cannot be approved if water level in the tank has not been defined).
- Shipping Screen
 - Facility Inventory Manager, Trade, National inventory Manager – data editing.
- After the streaming is complete, the system will create an updated file/report of the inventory, including the new ratio between the materials. It will be possible to send automatically a partial data report to a relevant party. For example, at a shipping terminal to refineries, a report of the composition and ratios of materials in a tank will be sent. In any case, it will not be possible to send automatically a complete report.
- The system will maintain continuity between shipments so that it will not be possible to confirm shipment 2 before shipment 1 is confirmed.

7.5 User Interface

The user interface will include screens that display objects or groups of graphic objects, windows, dialog boxes, symbols, colors and more.

7.5.1 Tanks Graphical Display

A graphical display of all the facility's tanks on one screen will allow filtering by type and sort by columns. From this screen, it is possible to access an individual display of each of the tanks

The system will allow adjusting the display as follows:

- Selection of table columns from a pre-defined list
- Sort table rows by selected column
- Manual update for each column
- Tank Groups – A screen tailored to each user that will display the tank group relevant to their work.

- Maintaining company standartization in all aspects of data presentation, including colors, symbols etc.

7.5.2 Streaming

- Graphical/Tabular display of all active streams in one tabular screen that can be sorted by columns.
- Graphical/Tabular display of all active flows and completed and approved flows.
- Clicking on the streaming pipeline will open a detailed streaming screen, from which it will be possible to manually update all data, including start date, as long as the streaming is not in the "Approved" status.
- Manually updated data will be displayed next to the original data on the screen
- A search/filter tool will allow to find a streaming/or stramings by: shipment number/flow no. source/destination/material/type/time range of start or end.
- Manually updated data will be displayed next to the original data on the screen
- The screen will include the following columns:
 - o Streaming Number
 - o Streaming Type (Reception, Transfer, Shipment etc.)
 - o Source Tank
 - o Destination Tank or other
 - o Start time
 - o End time
 - o Streaming Status
 - o Approval Status

7.5.3 Materials

At the appropriate permission level, it will be possible to define/add/update the list of materials in the system.

8. Reports

The system will include options for automatic generation of Reports that carry a digital signature or other confirmation of Custody Transfer.

The system will allow for adjusting report fields, and defining additional reports. Report generation will be possible at several definition levels such as regular data report, comparative report, internal report and customer report. Reports will include data of report for inflow, shipment tank movements, etc,

Required reports include:

- **Shipment Report:** For each selected tank specify the source of the flow and the destination of flow for start and end data: start time, end time, Level, Water Level, Temperature, Density, actual Volume, Water Volume, Volume at standard conditions (15°C), and Mass. In addition, document any manual data update, malfunctioning measuring device in the tank, starting the streaming after it had actually started etc. Allow data to be retrieved for a flow meter for a source or destination that is not a tank.
- **Daily Tank Report:** Will be automatically generated at a selected time for the last 24 hours (in most facilities it will be generated at 05:00 am, for distribution at 03:00 am). The report will detail the data for each tank in the facility and includes: Tank no. Product, Level, Temperature, Density, Volume, Volume at standard conditions (15°C), Mass, and Height daily difference. The difference indicates the movement in the tank for the last day.
- **Daily Tank Monitoring:** A report in tabular format records the tank daily data, each row created every hour. The report may be generated for a flexible selection of date and time range. Default – generate a report with data from the last 24 hours. The report will list tank data: Tank no. Product, Level, Temperature, Density, Volume, Volume at standard conditions (15°C), and Mass
- **Manually Update Values:** allow for manually update of all values that appear in the report. The manual update will be documented in a separate pipeline and will only be performed by those with appropriate authorization level. All manual updates are recorded and saved in the system.
- **Tank Farm report –** The amount of each type of fuel that was in the tank farm 24 ago. The report details the amount of fuel that was received at the tank farm in the last 24 hours, the amount delivered to customers and the amount available at 05:00 today. Report includes differences in balance.
- Reports will be prepared in English for the benefit of international suppliers and appraisers. Preferably to have reports also in Hebrew, the native language of most company's employees.