

DEPLOYABLE, READY-TO-OPERATE PACKAGED PLANT MBR System Supply Asset Management - Digital Operation

Digital technologies are reshaping every business and industry. Consistent and efficient operations are critical. As experienced operators continue to retire, it is necessary to mitigate the loss of institutional knowledge. Operators need a simple and easily accessible guide with information-rich, circumstance-based tools to ensure tasks are completed on time and the right way every time.

Engagements that are focused on using technology to drive business outcomes have a far better chance of delivering improvements in business value and process improvements. It is especially powerful when operators can visualize results — for example, they will be able to instantly locate all of those assets on a map or interactive manuals with links directly to informational videos or manufacture service manuals. Without organized digital information, limited knowledge access could delay required work and impact the operational efficiency of the plant.

A properly managed asset at a wastewater plant and the uptime of the equipment is critical to the operation, process and end-user satisfaction. With this in mind, and with the desire to help the operator maintain their assets and provide results necessary to make good decisions, smart and simple applications allow the operations team to easily manage their asset throughout its entire product lifecycle.

The following is suggested specification language to capture this topic:

Note to design Engineer: Verify values and statements bounded by square brackets, [], and remove highlighted alternates and instructions.

SECTION [XX XX XX] SPECIFICATION - ASSET MANAGEMENT

1.01 MBR SYSTEM SUPPLY ASSET MANAGEMENT, DIGITAL OPERATIONS

A. Definitions

1. MBR System Supplier: The Company responsible for providing all equipment and services as described herein and for providing warranty support.
2. MBR System: A fully inclusive MBR System of equipment, tankage, and controls, pre-engineered to be ready-to-operate upon delivery.
3. Digital Operations: Is specific hardware with a suite of digital training and operational support items. Installed on the very iPad platform, Digital Operations offers a highly customized interactive training environment.

B. Integration and Controls

1. System Control Panel

- a. The PLC shall be provided to control equipment included with the MBR System package. The PLC shall provide the functions described by the P&IDs and control narrative. The PLC program will be thoroughly documented to facilitate future troubleshooting or modifications.
- b. The System Control Panel shall be factory installed on the equipment skids or porches and pre-wired to other components on the equipment skids or porches. Contractor to provide electrical power and conduit to the panel and between the panel and any electrical items shipped separate from the equipment skid.
- c. The System Supplier shall supply all equipment and custom software programming as required for a fully operational system, and shall provide the necessary hardware/software to allow for remote monitoring of the MBR System. The contractor shall provide a high speed network connection.

2. SCADA System

- a. Plant SCADA system shall include the following:
 - i Graphical interface
 - ii Trending capability
 - iii Remote monitoring
 - iv Remote alarming
 - v Remote plant control
- b. Remote monitoring and alarming shall include telephone contact to the plant Operator.
- c. A wireless station shall be factory installed in the panel so that a Digital Operation system may access digital functions within the area of the system.
- d. Plant SCADA system shall be Red Lion software running on a panel mount PC located in the System Control Panel and factory installed.

C. Digital Operation Systems

1. A tablet shall be provided for digital interface. The digital tablet shall be enabled for wireless connectivity through the Control Panel.
2. The tablet shall be configured as follows:
 - a. Screen shall have a minimum 9.4 inch x 6.6 inch display with 2048 c 1536 screen resolution.
 - b. Multi-touch display.
 - c. 64 GB storage capacity.

- d. A8X chip with 64-bit architecture.
 - e. Wireless: Wi-Fi (802.11 a/b/g/n); dual channel (2.4 GHz and 5 GHz); and cellular connection for carriers AT&T, Verizon, Sprint and T Mobile..
 - f. Minimum 1.2 megapixel HD front and 720p HD video Minimum 8.0 megapixel rear camera with f/2.4 aperture, and video 1080p HD recording.
 - g. Bluetooth 4.0.
 - h. Sensors – Three axis gyro and accelerometer.
 - i. Up to 10 hours built in battery time.
 - j. Accessories shall include:
 - i Military grade cover and shoulder strap
 - k. Manufacturer & Model: Apple iPad Air 2, 64GB with WiFi and cellular
3. Digital Operation shall include, with wireless access to:
- a. Remote access to system HMI and SCADA with identical operator interface and functions as the on-board system.
 - b. A MBR System Supplier managed Web Portal for Customer access to asset management. The web portal shall include:
 - i Equipment Information.
 - ii Contact information.
 - iii Maintenance schedules.
 - iv Parts ordering.
 - c. A weekly downloaded system status report that are archived by date and easily accessible containing:
 - i Daily average flow.
 - ii Daily average flux.
 - iii Daily average permeability.
 - iv Daily average TMP.
 - v Daily average turbidity.
 - vi Daily dissolved oxygen.
 - vii Daily average total suspended solids.

- viii Alarms generated
- ix Organized for each parameter with the following:
 - a) Data Table
 - b) Dashboard
 - c) Trend Chart
- d. Digital interactive and searchable Operations and Maintenance manual shall include the following:
 - i Digital links within and between Drawings, PIDs and equipment data sheets.
 - ii O&M with digital links between subsystems, control narrative, data sheets, trouble shooting guidelines, manufacturer service manuals.
 - iii Operational Videos.
 - iv Operation Forms
 - v Downloads of drawings, PIDs, manuals, data sheets and guidelines.
- e. Access to MBR System Supplier technical support website which contains the following:
 - i General technical memorandums
 - ii MBR Forum
 - iii Technical Papers
 - iv Technical Support Blog
- f. Skype
- g. Operator Apps
 - i Microsoft Office Suite
 - ii Pen Ultimate
 - iii Good Reader
 - iv Drop Box
 - v Vibration / Sound Analyzer
 - vi Dirty Power Analyzer

D. System Commissioning

1. The Membrane System Supplier shall coordinate with the Owner for execution of the Digital Operations System Commissioning.
2. The Membrane System Supplier shall provide materials and personnel in support of the commissioning to video, commissioning and site specific videos and editing of those videos, etc.
3. In advance of commissioning the Membrane System Supplier shall perform an offsite acceptance test of the systems.
4. The System Commissioning will consist of the following:
 - a. Connectivity.
 - b. Functionality of all interactive systems.
 - c. Site check out to create video plan.
 - d. Video capture of MBR System Commissioning.
 - e. Training.
5. The Digital Operations Commissioning shall begin, within the limits defined herein:
 - a. Successful completion of a pre-commissioning acceptance test is required.
 - b. Start of commissioning shall be no later than 60 days after completion of acceptance test.
 - c. 2 days onsite shall be utilized to complete commission and training.

E. Training

1. The Membrane System Supplier shall provide Training in the operation of all Digital Operation systems included in the supply.
2. Training shall be completed prior to the completion of the System Commissioning. All training shall be performed by the Membrane System Supplier or a factory-certified representative of the supplier or component supplier. Training is to include:
 - a. Navigation of all apps and menus.
 - b. Review of all applications.
 - c. Trouble shooting.
 - d. Video

END OF SECTION

The following is suggested specification language to capture and evaluate the MBR System Supply Asset Management, Digital Operation:

Note to design Engineer: Verify values and statements bounded by square brackets, [], and remove highlighted alternates and instructions.

SECTION [XX XX XX]
PROCUREMENT BID EVALUATION – ASSET MANAGEMENT

1.01 BID EVALUATION

- A. The MBR System Supplier shall provide all of the information required by the Bid Documents. This information, along with other design and equipment information contained in the Bid Documents or available to the Owner through information included in the Bid will be used by the Owner to determine the apparent successful Bidder. The Owner may verify information and references provided in the Bid as part of the Bid evaluation.
- B. In accordance with applicable law, the Owner reserves the right to reject any or all Bids and to waive any informality in any Bid. By submitting a Bid, each Bidder agrees that the Owner, in determining eligibility for the award, may consider the Bidders conduct and performance under other contracts, financial condition, and other factors, including claims against the Bidder, which could affect the Bidders ability to provide the Goods and Special Services. The Owner may conduct such investigations as the Owner deems necessary to assist in the evaluation of any Bidder and to establish the responsibility, qualifications and financial ability of the Bidder to provide the Goods and Special Services in accordance with the Contract Documents to the Owner's satisfaction within the prescribed time. The Owner shall be the sole judge of responsiveness as well as who is considered a Responsible Bidder and reserves the right to reject the Bid of any Bidder who does not pass any such evaluation to the sole satisfaction of the Owner.

1.02 ASSET MANAGEMENT, DIGITAL OPERATION QUALIFICATION CRITERIA

- A. MBR System Suppliers shall be experienced in providing the Goods and Special Services as described herein. MBR System Suppliers shall possess sufficient equipment, capital and manpower to provide the Goods and Special Services within the time allowed. A Bid may be rejected if MBR System Suppliers cannot show that they have the necessary ability and equipment to provide the Goods and Special Services at the time prescribed and thereafter to prosecute and complete the supply of Goods and Services within the time specified.
- B. Membrane System Suppliers submitted for consideration shall meet qualification criteria as described below. A "yes" answer shall be provided to all questions below to satisfy the qualification criteria for participation in Membrane Bioreactor Equipment Procurement.

1. The Membrane System Supplier shall maintain throughout the life of the2 project a secure web portal for customer access to an asset management tool. The web portal shall include, at a minimum:
 - i Equipment Information.
 - ii Contact information.
 - iii Maintenance schedules.
 - iv Parts ordering.

The Bidder hereby certifies that the above is true.

Yes _____

No _____

The supplier shall provide, with the bid, login access to this portal, with an example facility set up for review or the requirement.

2. The MBR System Supplier shall have as a product, a digitally interactive and searchable Operations and Maintenance manual which shall include the following on a interactive tablet or iPAD:.
 - i Digital links within and between Drawings, PIDs and equipment data sheets.
 - ii O&M with digital links between subsystems, control narrative, data sheets, trouble shooting guidelines, manufacturer service manuals.
 - iii Operational Videos.
 - iv Operation Forms
 - v Downloads of drawings, PIDs, manuals, data sheets and guidelines.

The Bidder hereby certifies that the above is true.

Yes _____

No _____

The supplier shall provide with the bid and example system. This example may be electronically provided through the web portal access noted in #1 above or though a website link.

3. The MBR System Supplier shall provide and maintain an easily accessible weekly downloaded system status report that is archived by date and includes at a minimum the following:
 - i Daily average flow.

- ii Daily average flux.
- iii Daily average permeability.
- iv Daily average TMP.
- v Daily average turbidity.
- vi Daily dissolved oxygen.
- vii Daily average total suspended solids.
- viii Alarms generated
- ix Organized for each parameter with the following:
 - a) Data Table
 - b) Dashboard
 - c) Trend Chart

The Bidder hereby certifies that the above is true.

Yes _____

No _____

The supplier shall provide with the bid an example report and the archive system. This example may be electronically provided through the web portal access noted in #1 above or through a website link.

4. The MBR System Supplier shall maintain a technical support website which contains the following:
- i General technical memorandums
 - ii MBR Forum
 - iii Technical Papers
 - iv Technical Support Blog

The Bidder hereby certifies that the above is true.

Yes _____

No _____

The supplier shall provide with the bid login access for verification and review of this requirement.

5. Digital System Operation Experience - The MBR System Supplier shall have at least four (4) Digital Operation Systems in operation. All of these references must have been a direct complete system supply of the MBR System Supplier.

The Bidder hereby certifies that the above is true.

Yes _____

No _____

List the facilities below used to satisfy the above criteria.

Name of Facility	Design Capacity (MGD)	Start Date Continuous Operation	Contact Name	Contact Phone#
1. _____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____

END OF SECTION