

SECTION 02068

SHORING, SHEETING AND BRACING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The construction of the new Battery E at the O'Brien Water Reclamation Plant will require excavation at the project site utilizing Earth Retention Systems (ERS).
1. ERS shall consist of shoring, sheeting and bracing necessary to protect workmen, existing structures, streets, walkways, utilities, pipes, trenches and pits, protecting earth slope, improvement, and excavation against loss of ground or caving embankments.
 2. Contractor shall furnish and install all temporary and permanent earth retention systems as required to perform the work as outlined in the contract documents, whether explicitly indicated or required to perform the work safely per the Contractor's means and methods protecting against displacement of adjacent ground or structures, and to protect against all dangers to passersby and/or workmen.
 3. The Contractor shall retain at his own expense, a Licensed Professional (Geotechnical) Engineer to design the Excavation Plan and a Licensed Structural Engineer to design the ERS. These engineers shall be licensed in the State of Illinois. The District has encountered boulders and other obstructions, such as gravel and concrete, during other construction projects at the facility in various locations. Such obstructions can have varying effects on installation depending on the type of ERS selected as part of the Contractor's means and methods. At the Contractor's discretion, additional borings shall be performed per the Contractor's Geotechnical Engineer's recommendations to verify underground obstructions and complete the design for the particular type of ERS selected. No additional compensation shall be granted to the Contractor for ERS modifications required for obstructions. The Contractor shall locate underground utilities and obstructions in the area using potholing or other exploratory excavation to determine the feasibility of the proposed method of earth removal and earth retention system. Driven or vibratory installed sheet piling shall not be used. Instead, if sheet piles are chosen, they shall be pushed into place using hydraulic methods.
 4. The Contractor shall furnish, install, monitor, and maintain the ERS capable of supporting excavated earth and resisting soil and hydrostatic pressures (including hydrostatic pressures due to perched water tables) and superimposed construction and surcharge loads. The ERS shall also be designed for surcharge from crane, equipment, and truck loading and adjacent roadways. Crane weights and locations surcharging the ERS shall be set by the Contractor. The ERS shall satisfy the deflection criteria provided in this specification. See Structural drawings for additional requirements pertaining to evaluation of existing structure or infrastructure for temporary construction loads.
 5. Protection of the excavation, and adjacent existing facilities is full responsibility of the Contractor. All adjacent facilities must remain fully operational during

construction and protected from any damage or settlement. All work under this specification is related to means and method of construction, and therefore full responsibility of the Contractor.

6. Contractor is responsible for maintenance of shoring, sheeting, and bracing. Removal of shoring, sheeting, and bracing is required unless otherwise noted in the drawings or specifications.
- B. Shoring, sheeting, and bracing shall be required at (but is not necessarily limited to) the following locations:
 1. As shown on Drawing Sheets C-011A and C-011B as well as various structural drawing sections.
 - C. Shoring, sheeting, and bracing shall be used if one or more of the following criteria are met:
 1. There is a grade differential between the new construction area and adjacent area, and there is not sufficient room for an open-cut excavation meeting OSHA requirements.
 2. Shoring, sheeting, and bracing is shown on the construction drawings.
 3. Shoring, sheeting, and bracing is otherwise required to protect existing structures, utilities, pipelines, or right-of-way.
 - D. Selection of ERS type is subject to District approval. Types of shoring and bracing system include, but are not limited to the following:
 1. Soldier Piles and Lagging
 2. Slide Rail System.
 3. Sheet Piling.
 4. Any other system required for completion of work.
 - E. Related Documents
 1. GSS – General Specification Sewers.
 2. Section 02222 – Construction or Demolition Debris & Soil Removal and Disposal.
 3. Section 02230 – Site Clearing.
 4. Section 02300 – Earthwork.
 - F. The ERS shown in the Contract Documents shall be designed and installed as internally braced ERS. All other ERS installed on the site shall be internally braced unless approved in writing by the District to be non-internally braced ERS.
 - G. Contractor shall include, in the lump sum bid all geotechnical engineering services related to site supervision, verification, and testing necessary for excavation work, temporary ERS, monitoring of the water table, field verification of subgrade conditions, identification of soft subgrade during excavation, and providing recommendations for over excavation and backfilling of soft subgrade areas in connection with backfill operations.
- ## 1.02 SUBMITTALS
- A. Photographic and Survey Documentation: Prior to starting the installation of the ERS, the Contractor shall document existing conditions adjacent to the proposed location of ERS.

1. Documentation shall take the form of high-resolution, minimum 24-bit color digital photographs of all visible portions of existing structures and utilities within an area of influence of the installed ERS, but not less than 50 feet. Photographs shall be taken of the entire surface of all visible structures or utility elevations within the range defined above and shall include perspective which clarifies the content and scale of the photo.
2. Each photo file shall be submitted in .jpg format with a consistent file naming convention that includes the date the photograph was taken and a general description of the object of the photo.
3. Photographs shall be taken under clear conditions with the sun in a position which enhances the clarity of the photograph. Substantial portions of the photographed surfaces shall not be in shadow.
4. Documentation shall also include survey of the locations and elevations of adjacent existing buildings and utilities by an independent testing agency at locations directed by the District.
5. All documentation shall be submitted to the District prior to the installation of the Earth Retention System in the given area. Photos which in the opinion of the District do not sufficiently document existing conditions shall be re-taken and resubmitted at no additional expense to the District.
6. Surveys shall also be taken during installation of the ERS when directed by the District, and after installation of the ERS is complete in order to assess whether any damage or settlement has occurred to objects outside the scope of the Contract.
7. The final location of the installed ERS must be surveyed by the contractor and reflected in the As-Built drawings to be submitted to District for records.

B. Shop Drawings and Calculations:

1. Submit Shop and Erection drawings and calculations signed and sealed by a Licensed Structural Engineer of the State of Illinois responsible for their preparation for District approval.
 - a. The design calculations shall include analysis of each stage of excavation with anticipated deflections and ground movements.
 - b. Design calculations shall be provided for all connections between ERS members.
 - c. Design calculations shall address eccentricities where member centerlines do not intersect and localized forces and effects between members such as struts, rakers, and walers.
 - d. Design calculations shall address the structural stability and strength of existing structures and utilities which are surcharged by the ERS and Contractor's equipment.
 - e. The effects of cranes and other equipment loads on existing structures and infrastructure shall be investigated and evaluated by the Contractor's Structural Engineer. The calculations shall be submitted to the District prior to mobilizing equipment at the intended locations. The District Engineer will provide Contractor with drawings of existing structures showing geometry and reinforcement, upon request.

- f. Calculations shall indicate ERS loads do not undermine or add loads to adjacent tank wall and other existing structures.
- g. Design calculations shall be submitted simultaneously with, and shall be fully coordinated with, the ERS Shop and Erection drawings.
2. Shop and Erection Drawings shall show all materials, method of joining, sizes of members, and thickness of materials and shall contain full and complete information regarding joints and fastenings. Shop and Erection Drawings shall show relative layout of existing adjacent structures and utilities, related beams, columns, piles, walers, rakers, and struts, including other supports and all openings correctly dimensioned or sized. Clearly describe the proposed ERS installation sequence in the shop drawings, including reference to other project benchmarks where appropriate. Provide fully developed details for all types of connections between components. All relevant dimensions shall be provided on the shop drawings.
 - a. Furnish ComEd with drawings for excavation, dewatering, shoring and bracing system for portions of work near the ComEd tower.
3. The ERS shall not be supported from any existing or newly constructed permanent structures without the prior written permission of the District.
 - a. Where such permission is requested, submit fully detailed proposed construction sequence and connection drawings of temporary bracing complete with the applied force magnitudes, directions and load cases. Also submit detailed instructions for when temporary bracing shall be removed from permanent structures and how connection points shall be repaired. Submit drawings and structural calculations for any temporary bracing required to facilitate raker or strut removal.
 - b. Structural calculations for temporary bracing shall demonstrate that permanent existing or proposed structures will not be overstressed by the ERS installation or removal. Evaluation of the structural adequacy of the existing or newly constructed permanent structures used to support loads applied by the ERS is the sole responsibility of the Contractor's licensed Structural Engineer designing the ERS.
4. Submit proposed sequence of ERS installation and removal (to include strut/raker installation and removal) for each unique ERS segment.

C. Monitoring Program:

1. Before the start of work, submit a vibration and movement monitoring plan to the Engineer for review.

D. Submit the following information regarding monitoring of ground deformations:

1. Within 14 days of proposed instrument installation, submit a detailed plan for the installation and monitoring of each instrument type as well as a survey control layout showing stable benchmarks and benchlines.
2. Within 24 hours after instrument installation, submit instrument locations, offsets, and as-built elevations as well as as-built installation dates, times and details.
3. A minimum of 5 days prior to excavation, submit initial readings for each instrument. For survey points, the initial readings shall consist of three separate readings from separate transverses to confirm repeatability. The initial reading shall be the average of the three initial readings.

4. Every week until the earth retention system is removed and the excavation backfilled, submit a report containing the date and time of instrument monitoring, construction or excavation activities in the vicinity of the instrument, instrument measure, and differences from initial reading to include both incremental and cumulative. The weekly report shall be signed by qualified on-site personnel.
- E. Submit the following regarding monitoring:
1. Submit a baseline report of vibrations at the site prior to commencement of work. The baseline report shall include the date and time of instrument monitoring and summary of vibrations.
 2. Submit weekly reports of continuous vibration monitoring. Reports shall include the date and time of instrument monitoring and a summary of vibrations at the end of each week, and a schematic plan of excavation and/or relevant construction activities at the time of monitoring.
- F. Submit the following regarding geotechnical investigations in the vicinity of earth retention systems:
1. Prior to work, submit a detailed plan for the geotechnical investigations, to include a boring plan, boring depths, boring details, and proposed laboratory testing.
 2. Prior to work, submit the name of the Contractor's proposed testing laboratory. Laboratory shall be AASHTO accredited for soil testing.
 3. Prior to work, submit the name and qualifications of the Contractor's Geotechnical Consultant, who shall be a licensed Professional Engineer (P.E.) in the state of Illinois. The Contractor shall also submit to the Engineer for the District's records, all calculations and test data for tests performed by the Geotechnical Consultant hired by the Contractor.
 4. All calculations and test data for geotechnical investigations.
 5. A geotechnical report, signed and stamped by the Geotechnical Consultant. The report shall contain soil parameters for use in the design of the ERS.
- G. Submit the name and qualifications of the Contractor's Structural Consultant, who shall be a licensed Structural Engineer (S.E.) in the state of Illinois.
- H. Submit the names and qualifications of firms and/or personnel who will perform surveying and continuous vibration monitoring. Surveys shall be conducted by a Professional Land Surveyor (P.L.S.) licensed in the State of Illinois.
- I. Submit a report of non-destructive detection via ground penetrating radar (GPR) or other means of locating existing underground pipelines and other underground obstructions prior to ERS installation. Report shall include a plan of pertinent areas showing locations and elevations of existing underground elements.
- J. All the field information shall be obtained by the Contractor prior to the beginning of the construction, to verify the existing conditions.
- K. Existing Structure, Utility, and Pipeline Protection Plan: Submit a plan for

locating and protecting existing structures, utilities, and pipelines during construction.

- L. Submit a detailed Excavation Plan. The Excavation Plan shall include, at a minimum, plans, sections, and details identifying the limits and locations of temporary ERS, open cut excavations, excavation procedures, construction sequencing, and backfill procedures. The Excavation Plan shall be stamped by the Contractor's Geotechnical Engineer. If the Excavation Plan contains details of temporary ERS elements, it shall also be stamped by the Contractor's Structural Engineer. The Excavation Plan shall be accompanied by signed and sealed calculations prepared by the Contractor's Illinois-licensed Structural Engineer demonstrating that existing and new permanent structures will not be overstressed due to excavation, temporary support, or backfill operations during all phases of construction.
- M. Submit a detailed Excavation Protection Plan. The Excavation Protection Plan shall include measures necessary to prevent water or ice from collecting in excavations or penetrating footing or slab subgrades before and after placement of concrete. Such measures shall include mud mat details, temporary pumps, insulating blankets, tarps, or similar means. The Excavation Protection Plan shall be part of the Excavation Plan submittal.
- N. Submit plan for determining extent and depths of water table, to include any perched water tables. Submit plan for dewatering within and near excavations. The details shall be part of the Excavation Plan submittal.
- O. Submit plans and details of existing utilities outside the OWRP fence line if any components of the ERS system extend beyond the OWRP fence line, if applicable.
- P. Submit agreement between the Contractor and adjacent property owner stating that the ERS components are acceptable within their property, if applicable.

1.03 QUALITY ASSURANCE

- A. The Contractor shall retain a Structural Engineer licensed in the State of Illinois, who has experience in providing successful engineering services for excavation support systems similar in extent required for this project.
- B. Regulations: Comply with local codes and ordinances of governing authorities having jurisdiction as well as OSHA CFR 1926 Subpart P.

1.04 SUBMITTAL REQUIREMENTS FOR COMPLIANCE WITH BUILD AMERICA, BUY AMERICA (BABA) FOR FEDERAL FINANCING

- A. For District projects receiving federal funding, either through federal grants or SRF loans, the Contractor shall provide a certification letter from the manufacturer for all submittals related to BABA products as specified in Section 11 of Appendix I.
- B. All equipment or material delivered to the project site shall be clearly marked and/or stamped as “Made in the USA”.
- C. In order to demonstrate compliance with BABA requirements detailed in Section 11 of Appendix I, the Contractor shall maintain the document described in the Mobilization section of the Proposal. The Contractor shall use the document to contemporaneously track the status of the certifications for the BABA products. The document, along with all material certifications, shall be saved electronically by the Contractor in the specified project management system. The Contractor shall include an updated document with each monthly application for payment. If the Contractor is allowed to use de minimis waivers for any products required by the Contract, the Contractor shall likewise track the de minimis items in the document and maintain documentation of the waivers electronically in the specified project management system.

1.05 JOB CONDITION

- A. Before starting work, check and verify governing dimensions and elevations. Survey condition of adjoining properties. Take photographs to record any prior settlement or cracking of structures, pavements, and other improvements. Prepare a list of such damages, verified by dated photographs, and signed by Contractor and others conducting investigation.
- B. Survey adjacent structures and improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations. Locate datum level used to establish benchmark elevations sufficiently distant so as not to be affected by movement resulting from excavation operations.
- C. During excavation, re-survey benchmarks daily. Maintain accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if cracks or other damage is evident.
- D. Existing Utilities:
 - 1. Notify the District and service utility companies having jurisdiction. Comply with requirements of governing authorities and agencies for protection, relocation, removal and discontinuing of services, as affected by this work.
- E. Existing Underground Pipelines:
 - 1. The Contractor is responsible for the location and protection of adjacent underground pipelines and the support of the underground pipes during the excavations and installations.
 - 2. The contractor shall use non-destructive detection methods such as ground-penetrating radar as necessary to locate existing underground pipelines and other existing underground obstructions.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified Structural Engineer licensed in the State of Illinois to design shoring, sheeting, and bracing to resist all lateral loading and surcharge, including but not limited to, retained soil, groundwater pressure, adjacent building loads, adjacent traffic loads, construction traffic loads, material stockpile loads, and seismic loads, based on the following:
 - 1. Compliance with OSHA Standards and interpretations, 29 CFR 1926, Subpart P.
 - 2. Compliance with AASHTO Standard Specifications for Highway Bridges or AASHTO LRFD Bridge Design Specification, Customary U.S. Units.
 - 3. Compliance with requirements of authorities having jurisdiction.
 - 4. Compliance with utility company requirements.
- B. Design and construct sheeting, shoring, and bracing systems so that vertical or horizontal movements of existing structures and utilities do not induce cracks, sags, or other damage to the existing structures or utilities.
- C. ERS shall be designed for a minimum surcharge of 300 PSF. ERS shall be designed for additional surcharge as required to accommodate contractor's equipment and vehicles to be used during construction.

2.02 MANUFACTURERS AND MATERIALS

- A. Use manufacturers and materials for shoring, sheeting and bracing as recommended by the Licensed Structural Engineer who designed the shoring, sheeting, and bracing.
 - 1. Use materials that are new or in serviceable condition.
 - 2. Wood Materials: Oak, or pine for wood lagging. Size and strength as required for application.
 - 3. Structural Steel: ASTM A36, ASTM A690, or ASTM A992
 - 4. Steel Sheet Piling: ASTM A328, ASTM A572, or ASTM 690 with continuous interlocks.
 - 5. Corners: Roll-formed corner shape with continuous interlock.

PART 3 - EXECUTION

3.01 SHORING, SHEETING AND BRACING INSTALLATION

- A. The Contractor shall furnish, place, and maintain all sheeting, shoring, and bracing required to properly support trenches and other excavations. Sheeting, shoring, and bracing shall also be placed as to allow the work to be constructed to the lines and grades shown on the Plans and as ordered by the Engineer.

- B. Install sheeting, shoring, and bracing to ensure minimum interference with roads, streets, walks, structures, and facilities.
 - 1. Do not close or obstruct, streets, walks, or facilities without permission from the District and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic if required by the District or by authorities having jurisdiction.
 - 3. ERS installation or removal shall at no time interrupt or interfere with plant operations.

- C. Install sheeting, shoring, and bracing without damaging existing buildings, structures, utilities, roadways, adjacent structures, and site improvements including new construction adjacent to excavation.

- D. Locate bracing struts or rakers to be clear of permanent work. Do not place bracing where it will be cast into permanent work. Maintain bracing until structural elements are supported by other bracing or until permanent construction can withstand lateral pressures.

- E. Prevent surface water including ice and frost from entering excavations by grading, dikes, dewatering, or other means.
 - 1. Design groundwater elevation for permanent structures is shown on Drawing Sheet S-001. It does not represent the actual groundwater level at the site and shall not be construed as a guaranteed or uniform groundwater condition across the project area. Contractor shall perform additional borings or install observation wells as necessary to determine the actual groundwater conditions. Contractor shall develop dewatering means and methods accordingly, based on site conditions, available geotechnical information, and the Contractor's construction approach.
 - 2. Contractor shall place mud mats over entire bottom of excavation areas, including beyond new structure footprints, to prevent water intrusion and damage to subgrade. See Drawing Sheet S-002 and Section 02300 for more mud mat details.
 - 3. Protect subgrade utilizing measures described in the approved Excavation Protection Plan. All excavation protection measures shall remain in place until the subgrade is fully protected by permanent construction.

- F. Do not expose the exterior walls or foundations of any existing tank or structure lower than 36 inches below grade, with the following exceptions: within 60 feet of the southwest corner of the Battery D Aeration Tanks or within 35 feet of the proposed air main penetration into the Battery D Operating Gallery Building.

- G. If at any time the method being used by the Contractor for supporting any material or structure in or adjacent to any excavation is not reasonably safe in the opinion of the District, the District may require and the Contractor shall provide additional bracing and support necessary to furnish the added degree of safety required by the District.

- H. The Contractor shall provide such added bracing and support by such method approved by the District as he may elect to use, but the taking of such added precautions shall in no way relieve the Contractor of his sole final responsibility for the safety of lives, work and

structures. The use of such additional bracing and support shall be without additional cost to the District. The failure of the District to order the aforementioned additional bracing shall in no way relieve the Contractor of his sole and final responsibility.

- I. If underground obstructions such as boulders, tree roots, construction debris, etc. are encountered at ERS locations, the contractor shall modify the design and installation of the ERS as necessary at no additional cost to the District.
- J. Use of tiebacks (soil or rock anchors) for ERS bracing will not be allowed.
 - 1. Contractor shall install internally braced earth retention systems without tiebacks. Tiebacks are not permissible due to presence of existing structures and/or utilities at the site. If the Contractor is able to obtain written permission from the Village of Skokie, and if it is confirmed that no conflicting utilities or other installations exist, the use of tiebacks may be considered by the District only for the ERS along the west fence line as shown on Drawing C-011A. Prior to the design and submittal of the ERS and tieback details, the Contractor must obtain a formal written agreement from the Village of Skokie stating that the tiebacks are acceptable within their property. The Contractor will also be responsible for identifying and avoiding all buried utilities outside the District property lines.
- K. Openings for struts or rakers through exterior permanent walls and slabs will not be permitted. Struts and walers shall be designed to maximize the extent of new concrete wall construction between planned construction joints.

3.02 FIELD QUALITY CONTROL

- A. Continuously monitor vibrations, settlements, and movements to ensure stability of excavations and constructed slopes to ensure that damage to permanent structures is prevented.
- B. Allowable vertical (heave/settlement) and lateral movements: 1/2 inch maximum at any location along or behind the sheeting, shoring, and bracing. Vertical and horizontal control shall be accurate to within 0.01 foot.
- C. Vibrations due to Contractor's operations shall not exceed 2.0 in/sec.
- D. Contractor shall not commence deformation monitoring, vibration monitoring, or instrument installation until all monitoring submittals have been approved by the District.
- E. Survey benchmarks daily during installation of sheeting, shoring, and bracing as excavation progresses, and weekly once the excavation is complete for as long as the excavation remains open. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify the District if changes in elevations or positions occurs or if cracks, sags, or other damage is evident in adjacent construction, or if measured vibrations exceed allowable.

- F. Cease work and immediately notify the District if vibrations exceed 2.0 in/sec. In the event vibrations exceed 2.0 in/sec submit a plan for accomplishing the work in a way that vibrations will be lower than 2.0 in/sec.
- G. Promptly correct detected bulges, breakage, or other evidence of movement to ensure that sheeting, shoring, and bracing remains stable.
- H. Promptly repair damage to adjacent facilities and utilities, above and below ground, caused by installation, removal, or faulty performance of sheeting, shoring, and bracing to the satisfaction of the District.

3.03 REMOVAL

- A. Remove sheet, shoring, and bracing when construction has progressed sufficiently to support lateral pressures.
- B. Remove bracing struts or rakers in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
- C. Remove all earth retention system components to a minimum depth of 48 inches below proposed final grade or as shown on the drawings. No additional payment shall be made for sheeting left in place.
- D. After permanent construction is complete within an excavation and before backfilling, core 6" diameter holes at 10'-0" centers (each way) through the mud mat between the edge of excavation and permanent construction to allow for drainage through the mud mat. A 12" thick layer of CA-7 topped with geotextile fabric shall then be installed over the entire mud between the new structure footprint and edge of excavation to promote free drainage and relieve trapped ground water.
- E. Fill all voids immediately with compacted backfill.
- F. Provide CAD-produced as-built plans of all sheeting and shoring walls and components left in place. Provide overall plans as well as plans of all pertinent areas at 1/8"=1'-0" scale. Provide pertinent information such as sheeting, shoring, and bracing types, sizes, spacings, elevations, offsets, and locations.
- G. Promptly repair damage to adjacent facilities and utilities, above and below ground, caused by installation, removal, or faulty performance of sheeting, shoring, and bracing.

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APPENDIX E – ABB COST PROPOSAL
(Addendum No. 8 Revision)

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MWRD

O'Brien Water Reclamation Plant Battery E Plant Expansion

Reference Number: JSH-240430-1 Firm

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Revision History

Revision History Table

Revision Number	Issue Date	Comments
Revision --	5/2/2024	Draft issued for review.
Revision 00	6/19/2024	Initial Release.
Revision 01	7/10/2024	Modify Terms and Conditions statement.
Revision 02	4/23/2025	Revise for 2025 Firm pricing, and Specification "Contract 21-092-3P O'Brien Water Reclamation Plant Battery E Activated Sludge Facility", 98%.
Revision 03	6/23/2025	Revise for Power Monitoring addition. Add Clarifications for Specification sections provided since Rev 02.
Revision 04	9/4/2025	Revised to add second location remote I/O cabinets, splitting I/O between locations per meeting/emails with customer August 2025. Adjusted quantities of switches, UPS, power supplies. Increased loop drawings per revised IO.
Revision 05	11/11/2025	Revised to remove extra McAfee licenses from equipment list, removed I/O cabinet from Metering Building (equipment will be mounted in existing cabinet), adjusted clarifications in Section 6, modified the Terms & Conditions document to remove previous contract scope, increased Warranty duration to accommodate the extended project schedule.

1 Introduction

ABB is pleased to submit this Firm proposal for the MWRD - O'Brien Water Reclamation Plant Battery E Plant Expansion. Our proposal covers the furnishing of the hardware, software, and services as described in the attached proposal, based on the request.

This proposal is based on the following:

- Provide controller, I/O, and cabinet hardware and software for the DCS.
- Provide DCS configuration and graphics engineering, and field services.

2 Hardware & Software Scope of Supply

2.1 Software Scope of Supply

ABB will be providing the following software:

- Two (2) 800xA Operator Workplace Client Expansion Licenses
- Two (2) PM891 Redundant Controller Software License
- Eight (8) CI867 Modbus TCP Software Licenses
- Four (4) CI871 Profinet I/O Software Licenses

2.2 Hardware Scope of Supply

The following hardware is included in the base scope of supply.

2.2.1 AC800M Controller Hardware

The control logic will be implemented in a controller of the AC800M family.

Several AC800M controller modules are available that vary in terms of processing power, memory size, and redundancy support. Each CPU module is equipped with built-in Ethernet port(s) for communication with other controllers and for interaction with operators, engineers, managers, and higher-level applications. These ports can be configured for redundancy for those cases where availability is of paramount importance. The module is also equipped with two RS-232C ports that can be used for point-to-point communication with programming/debugging tools and with third-party systems and devices.



AC 800M PM891 controller

Features of the controllers include:

- Connector for power supply and status signals (L+, L-, SA, SB).
- DB25 connector for Electrical CEX-Bus (for communication interfaces like Profibus, Modbus TCP, etc.)
- Internal battery and external battery connector.
- Real time clock.
- RJ45 connectors for two Ethernet Control Networks CN1 and CN2
- Two COM ports (COM3 for RS232 serial links, COM4 as a service port).
- Optical ModuleBus connector for connection to a maximum of seven I/O clusters, with 12 non-redundant or six redundant modules (that is, 7x12 = 84 modules).
- Connectors for Redundancy Link.
- CF Compact Flash memory connector
- LEDs and Pushbutton reset switch

Control Processor Proposal Summary

Control Area	Item	Redundant	Quantity
Battery E	PM891	Yes	Two (2) Redundant Pairs

Notes:

1. ABB has included 20% spare controller capacity.

2.2.2 S800 I/O

The S800 Input/Output (I/O) system utilizes a wide variety of input, output, and signal conditioning modules to interface process signals to the ABB Distributed Control System. Module types, ranging from standard analog and digital I/O to specialty I/O such as sequence of events, can be combined to provide a comprehensive set of functionality to meet all market and industrial requirements. The S800 I/O modules are designed to support online replacement. Modules can be removed and inserted under power.



I/O Module Proposal Summary

Location	AI890 Module (8-Point) Qty.	AI830 RTD Module (8-Point) Qty.	AO890 Module (8-Point) Qty.	DI828 Module (16-Point) Qty.	DO818 Module (16-Point) Qty.
Battery E – RIO-01	13	1	4	25	4
Battery E – RIO-02	17	1	6	19	2
PCB	-	1	-	2	-
Metering Building	1	1	1	1	-
Spare I/O Modules	3	1	1	5	1
Total	34	3	12	52	7

Notes:

1. *Digital Outputs are provided with relay boards.*
2. *Marshalling is provided for digital inputs and outputs.*
3. *A minimum of 20% spare I/O is provided.*
4. *Cabinets are provided with temperature monitoring.*

2.2.3 Interface Hardware

Interface Proposal Summary

Item	Qty.	Location/Comments
CI867 Modbus TCP Interface	4 pairs	Redundant Interface to Flygt MAS
CI871 Profinet I/O Interface	2 pairs	Redundant Interface to S800 I/O
CI845 Ethernet FCI, TC860, TC810 - Redundant Interface to Profinet S800 I/O Stations	5 pairs	Battery E – RIO-01
	4 pairs	Battery E – RIO-02
	1 pair	PCB
	1 pair	Metering Building

2.2.4 Spare Parts

Please see the Equipment List in the Attachments section for a list of spare parts included in the base offering.

2.2.5 Plant Networking Hardware

Plant Network Switch Proposal Summary

Type	NE810 Switch Quantity	NE820 Switch Quantity
Controller Network	4	6
Modbus TCP	2	2
800xA Network	4	-
Profinet I/O Network	6	4
Drives Network	43	-
Power Monitoring Network	6	-

Notes:

1. All switches are ABB managed switches.
2. Switches are provided with SFP Transceivers for all networks except the drives network.

2.2.6 Cabinet Areas Scope of Supply

Cabinet Proposal Summary

Area	Comments
PCB DCS Room	One (1) new Controller cabinet (72"W x 72"H x 18"D) with networks to remote I/O locations, NEMA 12, front-access, two-door with vents, exhaust fans, and floor stands. Sized to accommodate three pairs of redundant controllers. One (1) 1500 W UPS is also provided.
PCB DCS Room	One (1) new I/O cabinet (48"W x 36"H x 12"D), with LED light, AC breaker and fuses.
Battery E – North	Two (2) new remote I/O cabinets, one left and one right (86"W x 78"H x 24"D), NEMA 4X, front-access, two doors per side. One (1) 1500 W UPS is also provided.
Battery E – South	Two (2) new remote I/O cabinets, one left and one right (86"W x 78"H x 24"D), NEMA 4X, front-access, two doors per side. One (1) 1500 W UPS is also provided.
Field Networking	Two (2) new Networking cabinets (48"W x 36"H x 12"D), each with four (4) networking switches, four (4) 20A power supplies, fiber panel, LED light, AC breaker and fuses.

Notes:

1. Metering Building I/O will be housed in an existing cabinet.

2.2.7 HMI Hardware

ABB will supply all necessary Dell computer hardware per ABB's specifications, third party software, and all third party equipment as follows:

- Two (2) 800xA Client Workstations
- Two (2) Industrial Pedestal Workstation enclosure with 24" monitor and industrial keyboard

ABB provides McAfee anti-virus software on all computers and Microsoft Excel on engineering computer.

Please see the Attachments section of this proposal and refer to the Overview Drawing and Detailed Bill of Material.

3 Project Organization

3.1 Project Management

A Project Manager will be assigned to the project. The Project Manager develops the project implementation plan in conjunction with the Project Team and is responsible for its execution in accordance with the Client's contractual requirements and expectations. The Project Manager is supported by the Lead Engineer and by Technical Specialists, as needed.

The Lead Engineer is responsible for directing the technical implementation of the project and assuring consistency and uniformity across the design and implementation phases of the project by following the design basis agreed upon with the customer.

3.2 Meetings

The following meetings are included.

Meetings Proposal Summary

Qty.	Meeting	Location	Duration	Attendees
1	Kick-off Meeting	Conference Call	2 Hours	Project Manager & Lead Engineer

Notes:

1. Additional review meetings can be conducted by conference call.

4 Project Engineering Services

4.1 Basis of Project Engineering

Below is the basis of system definition and engineering.

4.1.1 System Tags for the DCS

Hardwired I/O Points Summary

Signal Type	Battery E, RIO-01	Battery E, RIO-02	PCB	Metering Building
Analog Input, 4-20 mA	81	111	0	2
RTD,	1	1	0	0
Analog Output, 4-20 mA	23	37	0	1
Digital Input, 120 VAC System Powered	309	240	8	4
Digital Output, 24/120 V Field Powered	42	24	0	0
TOTAL	456	413	8	7

Notes:

1. I/O counts are per specification section DCS Input/Output Schedule emailed to ABB June 5, 2025, updated via email August 8, 2025.

Foreign Device Interface Points Summary

- Two-hundred fifty-nine (259) Soft I/O points, as detailed in the Attachments section.

4.1.2 System Displays

System Display Summary

ABB will provide the following graphics:

- One (1) Overview Graphic
- A total of eight (8) Process Graphics (including System, Process, and Trend Displays).

4.2 Controller Logic Engineering Services

ABB will provide the engineering services required to configure the new controller as defined below. Part of the engineering services will be provided from the office, with the remaining to be provided on-site.

- Application engineering services required for control logic and sequences to support new controllers.
- Hardware layout design for new controllers and I/O. Note: AC800M controllers to be installed in new cabinets.

- ABB’s MOD300 CCF library will be used for the AC800M controller configuration. This library will give the same look and feel as the existing operator interface and logic.
- Hardware assembly includes the mounting of equipment (modules, power, terminations, etc.) onto din-rails mounted in new enclosures and wiring of power and communications channels located within the cabinets.
- Loop Drawings for eight-hundred eighty-four (884) hardwired I/O points.
- Project services also include Project Management, Procurement, System Documentation, Site Testing and Site Services.

4.3 Customer Witness Test

ABB has based the proposal on providing the following:

Customer Witness Test Proposal Summary

Location	Duration
Customer Witness Test Hardware - ABB Assembler Cleveland, OH	Three (3) Days
Customer Witness Test Software – Customer Plant Site during 2 nd Programming Review Workshop	One (1) Week

5 Field Service

A detailed Summary of the service support hours can be found below.

Field Service Proposal Summary

ABB Personnel	Purpose/Outage	Trips	Duration	ABB Personnel Shifts
Field Service Engineer	Kick-off Meeting, Site Walkdown and Data Gathering	1	4 Days	12hr Days (Monday - Thursday)
Field Service Engineer	Design Review Meeting and Discussions	1	4 Days	12hr Days (Monday - Thursday)
Field Service Engineer	Two Programming Review Workshops (See note 6)	2	8 Days	12hr Days (Monday - Thursday)
Field Service Engineer	Application Engineering, Field Installation, and Commissioning	7	28 Days	12hr Days (Monday - Thursday)
Field Service Engineer	Formal Training	1	4 Days	12hr Days (Monday - Thursday)

Notes:

- 1. Any adjustment of hours (increase or decrease) will result in a responding change order. Please note, a per diem rate for Field Service is provided in the Commercial Section of this proposal for your information.*
- 2. The Field Service Engineer shall be granted unencumbered access to the equipment upon which work is to be conducted. Standby time, resulting from any issue, will be charged against the stipulated hours.*
- 3. Field Service time is based on 12-hour work days, Monday through Thursday, during normal working hours.*
- 4. Travel & Living expenses have been included.*
- 5. Formal Training for two four-hour sessions for each of three shifts to take place during one four-day work week. Additional training will take place informally during commissioning. ABB will provide standard training materials.*
- 6. One workshop shall be conducted once the draft process graphic displays are developed, and the second workshop shall be conducted a minimum of six weeks prior to anticipated start-up.*

6 Clarifications and Technical Comments

ABB's proposal is in accordance with the customer specification as amended by the following comments. The majority of the following comments indicate minor variances that allow an equal level of functionality to be provided at a lower contract price. These comments may be eliminated with an increase in the contract price, but not necessarily an equivalent increase in the level of functionality delivered. ABB's proposal meets the functional intent of the specification, and at the lowest possible contract price.

This Proposal is in accordance with the 100% Specification Documents (listed below) for Contract 21-092-3P O'Brien Water Reclamation Plant Battery E Activated Sludge Facility project as amended by the comments in the tables below.

- Section 13100 – I&C System General Requirements
- Section 13300 - Distributed Control System
- Section 13309 – Process Control Narrative
- Section 13310 – Distributed Control System Input/Output Schedule
- Section 16160 - Cabinets and Enclosures, with the exception of any UL requirements
- Drawing IC-002

The validity of ABB's proposal is contingent upon the following comments and qualifiers being incorporated into the contract arising from this proposal:

General Comments – Applicable to all Spec Sections

1. Installation, demolition and equipment required for these activities to be supplied by others.
2. All cabling and wiring to be supplied and installed by others.
3. VFD's, Control Panels, Instrumentation (and calibration of instruments), and Fiber Optic cables and associated equipment outside of proposed cabinets and configuration/engineering thereof are by others.
4. Software testing at site will show graphics without live or simulated values.

5. If required, controller cabinet central UPS system to be provided by Customer.
6. Scope not specifically identified in this proposal is outside ABB's scope of supply. ABB's scope of supply is to implement the DCS logic.
7. The customer will provide ABB with sufficient advance notice of the required plant outages to perform the required on-site work in a manner that does not require an expedited on-site schedule.
8. The Customer will be required to provide a drawing package to be used for installation purposes to ABB and the subcontractor. Required information includes plan and elevation views of locations where the conduit fiber routes and ABB hardware are to be installed. Note that some of these drawings exist and will be reused from the current fiber project or other ongoing infrastructure projects. ABB will also require all relative submittals from other vendors.
9. Final I/O list and cabling information documentation provided by ABB to the Customer will be in Excel spreadsheet format.
10. ABB has not included any modifications or materials for the existing field hardware or other control sub-systems as part of this offering.
11. No testing of interfaces to any third-party system is included in the Customer Witness Testing.
12. Customer Witness Test does not include verifying functionality of all 3rd party interfaces (Foreign Device Interface functional check).
13. Cabinet/Sub-panel layouts are per ABB standards.
14. Customer to provide labor for any required power, field, network, or LAN cabling to the new cabinets.

Section 13100 – I & CS General Requirements		
Section	Reference	Comment
1.01.A	Summary	ABB will only provide DCS for this project. ABB takes exception to any other items. ABB will not provide coordination with other vendors. ABB will support any coordination meetings required by the System Integrator. ABB will not provide any instantiation or construction whatsoever.
1.01.D	Support for Testing	ABB has quoted a block of hours as laid out in our proposal. ABB will pull our service engineers from site once those hours are utilized. A change order in advance would be required for additional time.
1.01.F	In addition, it should be noted that Section 13100...	The intent of this statement is not clear. ABB assumes it is applicable to the General Contractor, but not specific to ABB's scope of supply.
1.01.G	Training	ABB's training is described in Section 5 and will cover the ABB Distributed Control System only. Instrumentation training to be provided by others.

Section 13100 – I & CS General Requirements		
Section	Reference	Comment
1.02	References	ABB will supply the equipment defined in our proposal, as previously provided to MWRD and currently operational, which do not necessarily comply with all of the standards referenced.
1.03.A	Control System Definition	ABB will supply only the equipment defined in our proposal, not other related equipment.
1.04	BABA	ABB will provide standard documentation only, as we have done with all of our MWRD contracts. ABB will not provide custom submittals.
1.05	System Description	ABB will provide standard equipment only, as with all of our other MWRD contracts and currently operational. All ABB equipment must be installed and protected in accordance with ABB's Site Planning and Preparation manual.. ABB will provide no other equipment, certifications, etc. than as explicitly described in our proposal.
1.06	Submittals	ABB will provide standard documentation only, as we have done with all of our MWRD contracts. ABB will not provide custom submittals.
1.07	Delivery, Storage, and Handling	ABB has included delivery. Storage and handling must be provided by others.
1.08	Project/Site Conditions	ABB will provide standard equipment only, as with all of our other MWRD contracts and currently operational. All ABB equipment must be installed and protected in accordance with ABB's Site Planning and Preparation manual. ABB will provide no custom or other equipment, certifications, etc. than as explicitly described in our proposal.
3.05	Installation	ABB has not included any instillation related scope of supply.
3.14.A	Sample Calibration Certificate	This Certificate is not applicable to ABB's scope of supply and will not be utilized.

Section 13300 – Distributed Control System		
Section	Reference	Comment
1.02	Drawings and general provisions of the contract...	<p>ABB takes exception to all parts of the General and Supplementary terms and conditions, as well as Division 1. ABB's proposal is based on our previously negotiated agreement with MWRD, which have been used for all projects since 2002. Thus, the Terms and Conditions of ABB's proposal are based on the Agreement for Requisition Number 1590829, Dated 2022, and all Amendments thereto between Metropolitan Water Reclamation District of Greater Chicago Inc. and ABB Inc, with the exception of Article 26 being updated to reference this offering herein. Other than the additional terms set forth herein below, no other terms and conditions shall apply. ABB reserves the right to increase price if purchaser requests any changes to the foregoing terms and conditions.</p> <p>ABB takes exception to all parts for Division 11 as it covers items not being supplied by ABB and are therefore inapplicable.</p>
1.03	References and Standards	The design intent of the proposed Control System is to comply with the most common codes, standards and design practices found in our own industry, as well as those of the markets we serve.
1.04, here and in other Spec Sections	BABA	ABB's understanding is that the BABA requirements do not apply to the our system because SCADA systems are listed as "Exempt Products" according to the AIS Site Visit Hand-out, where Exempt Products are defined as "Materials that are not considered construction materials for the purpose of the AIS requirement, including mechanical and electrical components, equipment and systems." Thus, ABB will not comply.
1.05.A.7	Submittals, Interconnection diagrams	ABB will provide its standard documentation for hardware, software and configuration (commensurate with existing plant drawings provided by ABB), with no customizations. Standard drawings do not include anything outside of the ABB cabinets (e.g., any details relative to field wiring, etc.).
1.05.A.16	Submittals, timeline	ABB does not take responsibility for the startup timeline, as many factors outside of ABB are involved.

Section 13300 – Distributed Control System		
Section	Reference	Comment
1.05.B	Preliminary O&M Manual	Preliminary O&M Manual to be assembled and submitted by others. ABB will provide standard documentation only, with no customizations. Specifically, ABB will not provide SAMA drawings or control strategy description. Only soft copy of actual configuration will be provided.
1.06	Final O&M Manual Submittals for Closeout	Final O&M Manual Submittals for Closeout to be assembled and submitted by others. ABB will provide standard documentation only, with no customizations. Specifically, ABB will not provide SAMA drawings or control strategy description.
1.07.A	...verify accuracy of all IO listings...	This task will require support from other contractors and vendors. ABB takes no responsibility for coordination thereof. ABB will be a contributor only.
1.07.D	...storage and handling of all equipment...	ABB will not be involved in storage or handling of equipment at the site.
1.07.E	Contractor shall be entirely responsible for meeting the requirements of the applicable codes, standards, Contract Documents, and to make all equipment functional.	ABB does not take responsibility for these items. All ABB deliverables will be standard documentation.
1.07.F	The District's decision shall be final and binding on Contractor.	ABB does not agree to providing unilateral decision-making to the District, nor to be bound thereto.
1.07.H	Isolated contacts	Digital I/O modules are provided with isolated contacts, analog I/O modules are not.
1.08.B	Spare Parts packaging	Standard packaging will be provided.

Section 13300 – Distributed Control System		
Section	Reference	Comment
2.01	DCS System Hardware and Software	ABB will provide standard hardware and software, commensurate with that already operating at the O'Brien WRP.
2.01.M	DCS supplier shall present the proposed monitoring and control strategies for Battery E...	Control narratives are by others and to be provided to ABB. ABB is responsible for implementing the control narratives. Workshops to be conducted to confirm ABB's implementation matches control narrative design provided by others.
2.01.R	IO Cabinet Quantity	Cabinet quantity per discussion with Customer August 4, 2025 and subsequent emails.
2.06.A	Payment Schedule	Please see ABB's proposed Payment Schedule in section 9.10 of this proposal.
2.06.B	Warranty	Warranty will be in accordance with Terms and Conditions included in the Attachments section below.
3.01.A	Interface with Other Products	ABB does not take responsibility for any coordination. ABB will be a contributor.
3.02	Factory Testing	Hardware factory testing to take place at ABB assembler. The Programming Review Workshop at Customer site will serve as Software factory testing. An integrated system test with all system equipment connected is not included in ABB's proposal at this time. Further discussion with the Customer is required to better understand the needs and assess the approach for conducting an integrated system test.
3.05	Installation	ABB takes no responsibility for installation.
3.06.A	Field Service Personnel	ABB will provide no more than one field service engineer. Contractor or District must provide any services need outside the DCS (e.g., at the instrument for loop checks).
3.08.B	48-Hour Proving Run	ABB takes no responsibility for field sensors/ transducers and instruments.
3.08.C.2	Operational Availability Demonstration	ABB service engineer will not be on site for the 30-day Operational Availability Demonstration.

Section 13300 – Distributed Control System		
Section	Reference	Comment
3.08.C.2. E & F	Control Panels, Sensors/ Transducers and Instruments	ABB takes no responsibility for field sensors/ transducers, instruments or local control panels.

Section 13309 – Process Control Narrative		
Section	Reference	Comment
1.02.C	Instrumentation HW and SW	ABB does not take responsibility for any instrumentation.

6.1 Proposal Exclusions

The following are excluded from the scope of this proposal, but some can be quoted upon request.

- Equipment not identified in this proposal
- Configuration of 800xA features not currently included in the existing system.
- Data in any files with errors will be processed for additional charges.
- Set up, configuration and connection of existing third party hardware/ software to the 800xA system is done by others (drives and other intelligent interfaces).



7 System Pricing

The System as Described in this Proposal: **\$3,796,800.00**

Notes:

- 1. The pricing does not include any taxes or duties that may be charged by any governmental authority. ABB Inc. shall be reimbursed for any such taxes, duties, etc. that it may pay on the work or equipment covered by any order resulting from this proposal.*

8 Optional Pricing

8.1 Field Service Pricing

If additional field service time, beyond the time included in the proposal is required, the field service will be invoiced per MWRD – O'Brien Water Reclamation Plant active and valid ABB Care Agreement. If no active and valid ABB Care Agreement is in place, field service will be invoiced at List Price in accordance with ABB Field Service Rate Sheet at the time services are rendered.

9 Purchase Order Instructions

If this proposal meets your approval, please send your purchase order referencing the Proposal Number, JSH-240430-1, Revision Number, and Date information to timmy.maypole@us.abb.com. If signatures are required, please send a signed version of the purchase order.

Please also include a statement in the purchase order referencing the agreed upon Terms and Conditions to be used.

10 Commercial

10.1 Terms and Conditions of Sale

The Terms and Conditions of this Proposal are based on the Agreement for Requisition Number 1590829, effective date of April 14th, 2023, and all Amendments thereto between Metropolitan Water Reclamation District of Greater Chicago Inc. and ABB Inc, with the exception of Article 26 being updated to reference this offering herein.

The warranty for this project shall remain in effect for a period of twelve (12) months from the date of formal project Acceptance, or until February 27, 2031, whichever occurs first.

Other than the additional terms set forth herein below, no other terms and conditions shall apply.

ABB reserves the right to increase price if purchaser requests any changes to the foregoing terms and conditions.

10.2 Cybersecurity Clause

ABB has established and maintain a formal information and cybersecurity program which includes commercially reasonable technical and organizational measures, in order to protect its automation solution or automation solution components against security breaches, accidental or unlawful destruction, loss, alteration, and unauthorized disclosure of, or access to its content. It is the customer's sole responsibility to provide and ensure a secure connection between the Customer's automation solution and the Customer's network or any other network on an ongoing basis. If the customer provides server, virtual host, client and/or networking components for the automation solution components, it is the customer's sole responsibility for establishing and maintaining appropriate measures. The Customer must establish and maintain appropriate measures (such as, but not limited to, installing firewalls, applying authentication measures, data encryption, installing antivirus programs, etc.) to protect the automation solution, including its network and external interfaces against any type of security violations, unauthorized access, interference, intrusion, leakage and/or theft of data or information. Customer waives any and all claims against ABB, its Affiliates, Officers, Directors, Employees or Assigns for damages and/or losses of whatever type related to security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information caused by Customer's failure to maintain the appropriate security measures described above.

10.3 Market Volatility Clause

The Parties are aware of the challenges related to outbreaks, epidemics, war (declared or undeclared), government regulations and acts of governmental authorities (including sanctions), civil unrest, and general shortages of electronic components and elements, market volatility, availability and cost of raw materials, commodities, as well as the shortage and market fluctuation of logistic/transportation availability, costs and capacities that may impact the normal business activity and cost of performance, the delivery [schedule(s)/dates] and/or the execution of the scope or performance of the Services, the impacts of which are currently unknown. Notwithstanding anything in this agreement to the contrary, if as a result of any of the above aforementioned events, the costs of Seller's performance increase or Seller's performance obligations are materially adversely affected or delayed, the Parties in the spirit of cooperation, will work together in good faith and within a reasonable time after the invocation of this Clause, to negotiate alternative contractual terms in terms of equitable adjustments to delivery [schedules/dates], pricing and/or possible reductions of the contractually owed quantity of the Equipment and / or Services to be delivered to Purchaser. The aforementioned shall be performed with a view to employing reasonable efforts to ensure that this agreement can be at least fulfilled in part.

Each Party waives any claim against the other Party either for direct damages and/or loss of profits and/or indirect and/or intermediate and/or consequential and/or punitive damages, penalties and/or liquidated damages arising from or anyhow connected with any of the challenges listed above. If any dispute or difference arises between the Parties, the Parties hereto shall endeavor to settle such dispute amicably.

Any contract, order acceptance or order confirmation by Seller is entered into and made subject and conditioned to the above terms, which the Parties recognize as fundamental conditions of any such agreement within the Parties.

10.4 Government Compliance

For all U.S. federal, state, and/or municipal end-user sales (collectively "U.S. Government"), Purchaser shall disclose and provide all U.S. Government contractual flowdown requirements to ABB Inc. and its affiliates and related entities (collectively "ABB") when requesting a quote/proposal from or placing an order with ABB. Purchaser shall indemnify, defend, and hold harmless ABB from and against all losses, costs, claims, causes of action, damages, liabilities, and expenses, including attorney's fees, all expenses of litigation and/or settlement, and court costs, arising from its failure to comply with this obligation.

ABB's proposal is conditioned upon the assumption: (i) there is not a small or diverse business set aside; (ii) absent a wage determination attached to the RFP ABB's services are exempt from prevailing wage obligations; (iii) absent an explicit prohibition listed in the RFP, ABB may procure from any country (except those countries and entities listed on a sanctioned list) consistent with applicable trade control laws; all rights to technical data or software are subject to ABB's standard commercial licenses; and (v) the price is considered reasonable and based upon adequate price competition.

Further, if this proposal supports a federal contract, ABB provides "Commercial Products" or "Commercial Services" as defined by the Federal Acquisition Regulation ("FAR") Part 2.101. In accordance with 41 U.S.C. 3307, contracts for the acquisition of

commercial products or commercial services shall, to the maximum extent practicable, include only those clauses— (1) required to implement provisions of law or executive orders applicable to the acquisition of commercial products or commercial services; or (2) determined to be consistent with customary commercial practice. Consistent with this statute, ABB’s proposal is conditioned upon the assumption only the following FAR clauses apply:

52.212-5(e) – including the FAR clauses explicitly indicating incorporation by being checked in accordance with the clause prescription; or

52.244-6 – if required to be incorporated in ABB’s customer’s contract.

Any change to these assumptions will be deemed a “change” and subject to a mutual agreement and an equitable adjustment.

10.5 Integrity Provisions

Applicable Integrity Laws means:

- (i) *Anti-bribery and anti-corruption laws:* including U.S. Foreign Corrupt Practices Act 1977 (as amended), UK Bribery Act 2010 (as amended), any legislation enacting the principles of the OECD Convention on Combating Bribery of Foreign Officials and any other applicable laws, rules, regulations, decrees and/or official governmental orders relating to anti-corruption, anti-money laundering and anti-tax evasion in relevant jurisdictions (collectively “**Anti-Bribery & Corruption Laws**”); and
- (ii) *Sanctions and trade control laws and regulations:* any applicable laws, regulations, or administrative or regulatory decisions or guidelines that sanction, prohibit or restrict certain activities including, but not limited to, (i) import, export, re-export, transfer, or trans-shipment of goods, services, technology, or software; (ii) financing of, investment in, or direct or indirect transactions or dealings with certain countries, territories, regions, governments, projects, or specifically designated persons or entities, including any future amendments to these provisions; or (iii) any other laws, regulations, administrative or regulatory decisions, or guidelines adopted, maintained, or enforced by any Sanctions Agency on or after the date of this Agreement (collectively, “**Trade Control Laws**”); and
- (iii) *Human rights and anti-modern slavery laws:* including The Universal Declaration of Human Rights, the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprises, the ILO Core Conventions on Labor Standards, the UK Modern Slavery Act and other similar human rights, anti-human trafficking and anti-modern slavery laws and regulations (collectively, “**Human Rights Laws**”).

Sanctions Agency means any governmental or regulatory body, instrumentality, authority, institution, agency or court that promulgates or administers Trade Control Laws including, but not limited to, the aforementioned governmental and regulatory bodies of (i) the United Nations, (ii) the United States of America (including the U.S. Department of Treasury Office of Foreign Assets Control, U.S. Department of State and U.S. Department of Commerce), (iii) the European Union or (iv) Switzerland.

Restricted Person means any entity or person included on a list (including U.S. and EU lists) of targeted parties, blocked parties, or persons subject to asset-freezing or other restrictions introduced under any applicable Trade Control Laws (and includes any entity that is directly or indirectly owned fifty (50) percent or more, in the aggregate or individually, or otherwise controlled by any Restricted Person).

1. Both Parties will comply with all Applicable Integrity Laws in connection with this Agreement. Both Parties shall also ensure that their respective employees, officers,

directors, and any affiliates or third parties engaged in any manner in relation to the Agreement shall undertake to comply with all Applicable Integrity Laws and the requirements set out in this Clause in connection with this Agreement. Both Parties confirm that they have not violated, shall not violate, and shall not cause the other Party to violate, any Applicable Integrity Laws in connection with this Agreement.

2. Each Party represents and warrants that, to the best of its knowledge, at the date of this Agreement neither it, nor any of their respective directors or officers are a Restricted Party. Each Party agrees that it shall promptly notify the other Party if it becomes a Restricted Party.
3. If, as a result of Trade Control Laws issued or amended after the date of this Agreement, (i) the Company becomes a Restricted Party, or (ii) any necessary export license or authorization from a Sanctions Agency is not granted, the performance by ABB or by any affiliates or third parties engaged in any manner in relation to the Agreement becomes illegal or impracticable, ABB shall, as soon as reasonably practicable, give written notice to the Company of its inability to perform or fulfil such obligations. Once such notice has been received by the Company, ABB shall be entitled to either immediately suspend the performance of the affected obligation under the Agreement until such time as ABB may lawfully discharge such obligation or unilaterally terminate the Agreement in whole or in part from the date specified in the said written notice or from any subsequent date thereafter. ABB will not be liable to the Company for any costs, expenses or damages associated with such suspension or termination of the Agreement.
4. In the event of suspension or termination as set out in Clause [3] above, ABB shall be entitled to payment as set out in [Clause[●]] of this Agreement and any reasonable associated costs necessarily incurred by ABB in regard to such suspension or termination including, but not limited to, all reasonable costs associated with suspending or terminating any subcontract placed or committed for goods or services in connection with this Agreement.
5. ABB goods, services, and/or technology may be subject to foreign trade restrictions, including dual-use trade controls. The Parties undertake to obtain all the necessary licenses and/or permits from the competent authorities for the import or export of ABB Products and/or Services. Products, services, and/or technology that originate in the United States are subject to the U.S. Export Administration Regulations ("EAR") and must not be exported, re-exported, or transferred (in-country) without obtaining the necessary valid licenses/authorizations of the competent US authorities.
6. The Company represents that it is the ultimate end recipient of any items provided under this Agreement, that the items are for civil use only. The Company further represents that it will not directly or indirectly sell, export, re-export, release, transmit or otherwise transfer any items received from ABB to any Restricted Parties, or parties that operate, or whose end use will be, in a jurisdiction/region prohibited by ABB including Belarus, Crimea, Cuba, Iran, North Korea, Russia, Syria, as well as the Donetsk, Luhansk, Kherson, and Zaporizhzhia regions of Ukraine (such list may be amended by ABB at any time). The Company further represents and warrants that the [Products and/or Services] provided under this Agreement shall not be installed,

used, or applied in or in connection with (i) the design, production, use or storage of chemical, biological or nuclear weapons or their delivery systems, (ii) any military applications or (iii) the operation of any nuclear facilities including, but not limited to, nuclear power plants, nuclear fuel manufacturing plants, uranium enrichment plants, spent nuclear fuel stores and research reactors, without the prior written consent of ABB.

7. For the avoidance of doubt, no provision in this Agreement shall be interpreted or applied in a way that would require any party to do, or refrain from doing, any act which would constitute a violation of, or result in a loss of economic benefit under, applicable Trade Control Laws.
8. Company shall immediately notify ABB in writing of any potential or actual breach of obligations set forth under Applicable Integrity Laws, the ABB Code of Conduct, or this Integrity Appendix by either the Company, its affiliated parties or any third parties engaged by Company in relation to the Agreement. In the event of such notification or if ABB otherwise has reason to believe that a potential or actual breach has occurred, Company agrees to cooperate in good faith with any audit, inquiries, or investigation which ABB deems necessary. During such audit, inquiries or investigation, ABB may suspend performance of its obligations until such time as ABB has received confirmation to its satisfaction that no breach has occurred or will occur. ABB shall not be liable to Company for any claim, losses or damages whatsoever related to its decision to suspend or terminate performance of its obligations under this provision.
9. Notwithstanding the foregoing or any other provision in the Agreement, in the event of any actual or imminent violation of Applicable Integrity Laws or material breach of obligations set forth under the ABB Code of Conduct or this Integrity Appendix, ABB shall, subject to mandatory provisions of Applicable Law, have the right to unilaterally terminate the Agreement with immediate effect. Such termination would be without prejudice to all rights of recourse which could be exercised by ABB, and ABB shall not be liable to Company for any claim, losses or damages whatsoever related to its decision to terminate performance of its obligations under this provision. Further, Company shall indemnify ABB for all liabilities, damages, costs, or expenses incurred as a result of any such violation, breach and/or termination of the Agreement. ABB may report such violations to relevant authorities as required by Applicable Integrity Laws.

10.6 Delays Caused by Customer

- a) If the performance of any work hereunder is delayed due to the actions of Purchaser, Purchaser will be responsible for all costs which ABB incurs as result of the delay, including, without limitation, overhead and a reasonable profit on all such costs; and any delivery date will be extended to reflect the delay. In addition, Purchaser shall make any such payments at such times that they would have become due had it not caused the delay in performance.
- b) If delivery is delayed due to any act or omission of Purchaser, or if having been notified that the Equipment is ready for shipment, Purchaser fails to take delivery or provide adequate shipping instructions, ABB shall be entitled to place the Equipment in

suitable storage at Purchaser's expense. Upon placement of the Equipment in storage, the Equipment shall be deemed delivered and all risk of loss and damage shall pass to the Buyer. Purchaser shall be responsible for all costs associated with such storage. Any amounts otherwise payable to ABB upon delivery shall be payable upon presentation of ABB's invoices.

10.7 Change in Law

The parties agree that in the event of any change in laws, regulations or increases in tariffs or duty rates imposed, implemented or enacted after the date of this agreement or change in interpretation of any laws, regulation, tariffs or duty rates affecting the cost of the goods and services set forth herein and/or the time of performance or delivery of the same, Seller shall be entitled to an adjustment in the contract price reflecting the change in the laws, tariffs or duty rates or other costs and any necessary adjustment to the time of performance or delivery of the goods and services.

10.8 Validity

This proposal is subject to acceptance within Ninety (90) days. All prices, schedules, and technical descriptions are valid throughout this period.

10.9 Payment Terms

Terms are Net 30.

ABB reserves the right to increase price if purchaser requests any changes to the foregoing.

10.10 Payment Milestones

- 20% - Upon Submittal of the Kick-Off Meeting Minutes
- 20% - Upon Initial DCS Hardware Drawings Submittal
- 20% - Upon Initial Functional Narrative and Control Drawings Submittal
- 20% - Upon Hardware Ordering
- 10% - Upon System Shipment
- 5% - Upon Completion of 60-Day Test
- 5% - Upon Customer Acceptance of Final O&M and As-built Drawings or Thirty (30) Days from Completion of 60-Day Test, whichever first occurs

ABB reserves the right to increase price if purchaser requests any changes to the foregoing.

10.11 Delivery

This proposal is based on delivery FCA Jobsite (Skokie, IL) per Incoterms 2020.

10.12 Schedule

Schedule will be mutually agreed between Purchaser and ABB after receipt of order. This proposal makes no commitment whatsoever to any schedule. ABB reserves the right to increase the price if schedule agreement requires any expediting measures.

10.13 Confidentiality

This proposal contains information that is proprietary to ABB Inc.

11 Attachments

1. Terms and Conditions
2. Field Service Rate Sheet
3. Hardwired I/O List
4. Soft I/O List
5. Detailed Bill of Material
6. Overview Drawing



Attachment 2

ABB US Service Standard Rate Sheet



ABB US PAEN Service Standard Rate Sheet – 2026

Primary Work Hours

The following labor rates are applicable during Primary Working Hours (PWH) defined as an 8-hour period beginning between 7:00 A.M. and 10:00 A.M. Monday through Friday, excluding national and ABB recognized holidays. The primary work hours include a one half-hour non-paid lunch period and two 15-minute breaks during the day.

Base Service Labor Rates

Technology	Service Type	Hourly Rate
Control systems (OCS/DCS)	Field Services	\$418
	Process Application Engineering Services	\$460
Power Generation Specialist	Turbine Control Systems Services	\$463
	Flame Scanner Services	\$463
	Power Plant Tuning	\$463
All	Process Control Tuning Services	\$455
	Regional Technical Advisor, Network & Security Services	\$460
	Process Optimization Services	\$478

Overtime Hours

For billing purposes ABB Inc. defines overtime as those hours worked outside the Primary Working Hours or in excess of eight (8) hours in one day. The standard charges for overtime are defined as follows:

- All work performed outside the PWH or over 8 hours in one day is charged at one and one half times the labor rate (Base Service Labor Rate X 1.5).
- All work performed on Saturday is charged at one and one half times the labor rate (Base Service Labor Rate X 1.5).
- All work performed on Sunday is charged at two times the labor rate (Base Service Labor Rate X 2).
- All work performed on national or an ABB holiday is charged at three times the labor rate (Base Service Labor Rate X 3).

Field Engineer Stand-By

- Engineer Stand-By support occurs when a customer requests an engineer to perform “stand-by” duty where that engineer is specifically reserved for that Customer and cannot be dispatched to another Customer job site. The customer reserving the engineer in stand-by readiness mode shall be charged for Stand-By service.
- Field Engineer Stand-By Service is charged at 4 PWH per day. If the “reserved” Field Engineer is called to this site, then 2 PWH will be credited to the customer. Overtime hours, travel expenses, travel time and other conditions of service per this rate sheet shall apply.

Telephone Support.....\$469.00 per hour

- A minimum of one (1) hour is charged per request.
- Additional charges are in one-hour increments beyond the first one (1) hour period.

Travel Costs

- Travel expenses are charged at 70 cents / mile or actual public transportation costs plus 10%.
- Living expenses are charged at actual costs incurred plus 10%.
- Completed Travel Time, to and from the Customer Site, will be charged at rates listed under this rate sheet.

Conditions of Service

- Scheduled Field Service visits may be cancelled subject to the following limitations:
 - Scheduled work of 0 to 7-day duration may be cancelled with no cancellation fee up to 48 hours prior to scheduled field engineer arrival.
 - Scheduled work of greater than 7-day duration may be cancelled with no cancellation fee up to 2 weeks prior to scheduled field engineer arrival
 - Scheduled work canceled outside these limitations will be subject to a cancellation fee equal to actual expenses incurred including but not limited to travel, travel time, and material shipment plus usage of prepaid field hours equivalent to 50% of the scheduled work duration.
- Service provided per this rate sheet is approved by the customer in the form of a purchase order or written authorization for additional hours prior to dispatching field personal to site.
- Other chargeable time will be invoiced which may include additional PWH and/or overtime spent at the customer’s facility, round trip travel to and from site, time spent preparing written service reports, and time for other customer requested activities.
- A minimum of four (4) hours is charged for any service call to a client’s facility.
- All information contained herein is proprietary data of ABB Inc. and that no disclosure, reproduction or use by third parties may be made without written permission of ABB.

2026 Holiday Schedule (Tentative and subject to change)

Thursday, Jan. 1 – New Year’s Day	Monday, Sept. 7 – Labor Day
Monday, Jan. 19 – Martin Luther King Jr. Day	Wednesday, Nov. 11 – Veteran’s Day
Friday, April 3 – Good Friday	Thursday, Nov. 26 – Thanksgiving Day
Monday, May 25 – Memorial Day	Friday, Nov. 27 – Thanksgiving Day (Day After)
Friday, July 3 – Independence Day	Thursday, Dec. 24 – Christmas Eve
	Friday, Dec. 25 – Christmas Day

Attachment 3

Hardwired I/O List

HARD I/O

#	SHEET	POINT DESCRIPTION	I/O LOCATION	SIGNAL TYPE	RANGE
17	IC-005	MAKEUP AIR UNIT 1 - RUNNING	BATTERY E RIO-01	DI	-
18	IC-005	MAKEUP AIR UNIT 1 - GENERAL ALARM	BATTERY E RIO-01	DI	-
19	IC-105	MAKEUP AIR UNIT 1 - TEMPERATURE	BATTERY E RIO-01	AI	32-100 DEGREES F
23	IC-005	MAKEUP AIR UNIT 3 - RUNNING	BATTERY E RIO-01	DI	-
24	IC-005	MAKEUP AIR UNIT 3 - GENERAL ALARM	BATTERY E RIO-01	DI	-
25	IC-105	MAKEUP AIR UNIT 3 - TEMPERATURE	BATTERY E RIO-01	AI	32-100 DEGREES F
26	IC-005	MAKEUP AIR UNIT 4 - RUNNING	BATTERY E RIO-01	DI	-
27	IC-005	MAKEUP AIR UNIT 4 - GENERAL ALARM	BATTERY E RIO-01	DI	-
28	IC-105	MAKEUP AIR UNIT 4 - TEMPERATURE	BATTERY E RIO-01	AI	32-100 DEGREES F
29	IC-005	SUMP PUMP 1 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
30	IC-005	SUMP PUMP 1 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
31	IC-005	SUMP PUMP 1 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
35	IC-005	SUMP PUMP 3 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
36	IC-005	SUMP PUMP 3 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
37	IC-005	SUMP PUMP 3 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
38	IC-005	SUMP PUMP 4 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
39	IC-005	SUMP PUMP 4 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
40	IC-005	SUMP PUMP 4 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
41	IC-005	SUMP PUMP 5 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
42	IC-005	SUMP PUMP 5 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
43	IC-005	SUMP PUMP 5 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
44	IC-005	SUMP PUMP 6 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
45	IC-005	SUMP PUMP 6 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
46	IC-005	SUMP PUMP 6 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
47	IC-005	SUMP PUMP 7 - PUMP A RUNNING	BATTERY E RIO-01	DI	-
48	IC-005	SUMP PUMP 7 - PUMP B RUNNING	BATTERY E RIO-01	DI	-
49	IC-005	SUMP PUMP 7 - HIGH LEVEL ALARM	BATTERY E RIO-01	DI	-
58	IC-006	GALLERY - BASEMENT NORTH HEAT ALARM	BATTERY E RIO-01	DI	-
59	IC-006	GALLERY - BASEMENT MIDDLE HEAT ALARM	BATTERY E RIO-01	DI	-
61	IC-006	GALLERY - UPPER LEVEL TEMPERATURE NORTH	BATTERY E RIO-01	RTD	32-100 DEGREES F
63	IC-006	ODOR CONTROL 1 - RUNNING	BATTERY E RIO-01	DI	-
64	IC-006	ODOR CONTROL 1 - GENERAL ALARM	BATTERY E RIO-01	DI	-
65	IC-006	ODOR CONTROL 2 - RUNNING	BATTERY E RIO-01	DI	-
66	IC-006	ODOR CONTROL 2 - GENERAL ALARM	BATTERY E RIO-01	DI	-
67	IC-106	MDP-E1 MAIN BREAKER OPEN COMMAND	BATTERY E RIO-01	DO	-
68	IC-106	MDP-E1 MAIN BREAKER CLOSE COMMAND	BATTERY E RIO-01	DO	-
69	IC-106	MDP-E1 MAIN BREAKER OPEN	BATTERY E RIO-01	DI	-
70	IC-106	MDP-E1 MAIN BREAKER CLOSED	BATTERY E RIO-01	DI	-
71	IC-106	MDP-E1 MAIN BREAKER IN REMOTE MODE	BATTERY E RIO-01	DI	-
72	IC-106	MDP-E1 TIE BREAKER OPEN COMMAND	BATTERY E RIO-01	DO	-
73	IC-106	MDP-E1 TIE BREAKER CLOSE COMMAND	BATTERY E RIO-01	DO	-
74	IC-106	MDP-E1 TIE BREAKER OPEN	BATTERY E RIO-01	DI	-
75	IC-106	MDP-E1 TIE BREAKER CLOSED	BATTERY E RIO-01	DI	-
76	IC-106	MDP-E1 TIE BREAKER IN REMOTE MODE	BATTERY E RIO-01	DI	-
77	IC-106	MDP-E1 CIRCUIT BREAKER 1 OPEN	BATTERY E RIO-01	DI	-
78	IC-106	MDP-E1 CIRCUIT BREAKER 1 CLOSED	BATTERY E RIO-01	DI	-
79	IC-106	MDP-E1 CIRCUIT BREAKER 2 OPEN	BATTERY E RIO-01	DI	-
80	IC-106	MDP-E1 CIRCUIT BREAKER 2 CLOSED	BATTERY E RIO-01	DI	-
81	IC-106	MDP-E1 CIRCUIT BREAKER 3 OPEN	BATTERY E RIO-01	DI	-
82	IC-106	MDP-E1 CIRCUIT BREAKER 3 CLOSED	BATTERY E RIO-01	DI	-
83	IC-106	MDP-E1 CIRCUIT BREAKER 4 OPEN	BATTERY E RIO-01	DI	-
84	IC-106	MDP-E1 CIRCUIT BREAKER 4 CLOSED	BATTERY E RIO-01	DI	-
85	IC-106	MDP-E1 CIRCUIT BREAKER 5 OPEN	BATTERY E RIO-01	DI	-
86	IC-106	MDP-E1 CIRCUIT BREAKER 5 CLOSED	BATTERY E RIO-01	DI	-
87	IC-106	MDP-E1 CIRCUIT BREAKER 6 OPEN	BATTERY E RIO-01	DI	-
88	IC-106	MDP-E1 CIRCUIT BREAKER 6 CLOSED	BATTERY E RIO-01	DI	-
89	IC-106	MDP-E1 CIRCUIT BREAKER 7 OPEN	BATTERY E RIO-01	DI	-
90	IC-106	MDP-E1 CIRCUIT BREAKER 7 CLOSED	BATTERY E RIO-01	DI	-
91	IC-106	MDP-E1 CIRCUIT BREAKER 8 OPEN	BATTERY E RIO-01	DI	-
92	IC-106	MDP-E1 CIRCUIT BREAKER 8 CLOSED	BATTERY E RIO-01	DI	-
93	IC-106	MDP-E1 GROUND FAULT	BATTERY E RIO-01	DI	-

HARD I/O

94	IC-106	MDP-E2 MAIN BREAKER OPEN COMMAND	BATTERY E RIO-01	DO	-
95	IC-106	MDP-E2 MAIN BREAKER CLOSE COMMAND	BATTERY E RIO-01	DO	-
96	IC-106	MDP-E2 MAIN BREAKER OPEN	BATTERY E RIO-01	DI	-
97	IC-106	MDP-E2 MAIN BREAKER CLOSED	BATTERY E RIO-01	DI	-
98	IC-106	MDP-E2 MAIN BREAKER IN REMOTE MODE	BATTERY E RIO-01	DI	-
99	IC-106	MDP-E2 TIE BREAKER OPEN COMMAND	BATTERY E RIO-01	DO	-
100	IC-106	MDP-E2 TIE BREAKER CLOSED COMMAND	BATTERY E RIO-01	DO	-
101	IC-106	MDP-E2 TIE BREAKER OPEN	BATTERY E RIO-01	DI	-
102	IC-106	MDP-E2 TIE BREAKER CLOSED	BATTERY E RIO-01	DI	-
103	IC-106	MDP-E2 TIE BREAKER IN REMOTE MODE	BATTERY E RIO-01	DI	-
104	IC-106	MDP-E2 CIRCUIT BREAKER 1 OPEN	BATTERY E RIO-01	DI	-
105	IC-106	MDP-E2 CIRCUIT BREAKER 1 CLOSED	BATTERY E RIO-01	DI	-
106	IC-106	MDP-E2 CIRCUIT BREAKER 2 OPEN	BATTERY E RIO-01	DI	-
107	IC-106	MDP-E2 CIRCUIT BREAKER 2 CLOSED	BATTERY E RIO-01	DI	-
108	IC-106	MDP-E2 CIRCUIT BREAKER 3 OPEN	BATTERY E RIO-01	DI	-
109	IC-106	MDP-E2 CIRCUIT BREAKER 3 CLOSED	BATTERY E RIO-01	DI	-
110	IC-106	MDP-E2 CIRCUIT BREAKER 4 OPEN	BATTERY E RIO-01	DI	-
111	IC-106	MDP-E2 CIRCUIT BREAKER 4 CLOSED	BATTERY E RIO-01	DI	-
112	IC-106	MDP-E2 CIRCUIT BREAKER 5 OPEN	BATTERY E RIO-01	DI	-
113	IC-106	MDP-E2 CIRCUIT BREAKER 5 CLOSED	BATTERY E RIO-01	DI	-
114	IC-106	MDP-E2 CIRCUIT BREAKER 6 OPEN	BATTERY E RIO-01	DI	-
115	IC-106	MDP-E2 CIRCUIT BREAKER 6 CLOSED	BATTERY E RIO-01	DI	-
116	IC-106	MDP-E2 CIRCUIT BREAKER 7 OPEN	BATTERY E RIO-01	DI	-
117	IC-106	MDP-E2 CIRCUIT BREAKER 7 CLOSED	BATTERY E RIO-01	DI	-
118	IC-106	MDP-E2 CIRCUIT BREAKER 8 OPEN	BATTERY E RIO-01	DI	-
119	IC-106	MDP-E2 CIRCUIT BREAKER 8 CLOSED	BATTERY E RIO-01	DI	-
120	IC-106	MDP-E2 GROUND FAULT	BATTERY E RIO-01	DI	-
128	IC-101	BATTERY E RAS FLOW	BATTERY E RIO-01	AI	0 - 100 MGD
129	IC-101	RAS METER ISOLATION VALVE NORTH - IN REMOTE	BATTERY E RIO-01	DI	-
130	IC-101	RAS METER ISOLATION VALVE NORTH - OPENED	BATTERY E RIO-01	DI	-
131	IC-101	RAS METER ISOLATION VALVE NORTH - CLOSED	BATTERY E RIO-01	DI	-
132	IC-101	RAS METER ISOLATION VALVE NORTH - FAULT	BATTERY E RIO-01	DI	-
133	IC-101	RAS METER ISOLATION VALVE NORTH - OPEN COMMAND	BATTERY E RIO-01	DO	-
134	IC-101	RAS METER ISOLATION VALVE NORTH - CLOSE COMMAND	BATTERY E RIO-01	DO	-
135	IC-101	RAS METER ISOLATION VALVE SOUTH - IN REMOTE	BATTERY E RIO-01	DI	-
136	IC-101	RAS METER ISOLATION VALVE SOUTH - OPENED	BATTERY E RIO-01	DI	-
137	IC-101	RAS METER ISOLATION VALVE SOUTH - CLOSED	BATTERY E RIO-01	DI	-
138	IC-101	RAS METER ISOLATION VALVE SOUTH - FAULT	BATTERY E RIO-01	DI	-
139	IC-101	RAS METER ISOLATION VALVE SOUTH - OPEN COMMAND	BATTERY E RIO-01	DO	-
140	IC-101	RAS METER ISOLATION VALVE SOUTH - CLOSE COMMAND	BATTERY E RIO-01	DO	-
279	IC-301	FERMENTER RAS ORP LEVEL	BATTERY E RIO-01	AI	(-1500) - 1500 mV
280	IC-301	ANOXIC PASS NITRATE LEVEL	BATTERY E RIO-01	AI	0 - 5 mg/L
301	IC-303	AERATION TANK 1 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
302	IC-303	AERATION TANK 1 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
303	IC-303	AERATION TANK 1 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
304	IC-303	AERATION TANK 1 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
305	IC-303	AERATION TANK 1 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
306	IC-303	AERATION TANK 1 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
307	IC-303	AERATION TANK 1 IMLR PUMP - IN REMOTE	BATTERY E RIO-01	DI	-
308	IC-303	AERATION TANK 1 IMLR PUMP - RUNNING	BATTERY E RIO-01	DI	-
309	IC-303	AERATION TANK 1 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-01	DI	-
310	IC-303	AERATION TANK 1 IMLR PUMP - HIGH MOTOR TEMPERATURE	BATTERY E RIO-01	DI	-
311	IC-303	AERATION TANK 1 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-01	DI	-
312	IC-303	AERATION TANK 1 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-01	DO	-
323	IC-303	AERATION TANK 1 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-01	AI	0 - 15 mg/L
324	IC-303	AERATION TANK 1 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
325	IC-303	AERATION TANK 1 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-01	AI	0 - 15 mg/L
326	IC-303	AERATION TANK 1 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
327	IC-303	AERATION TANK 1 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
328	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
329	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
330	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
331	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
332	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%

HARD I/O

333	IC-303	AERATION TANK 1 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
334	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
335	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-01	DI	
336	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
337	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-01	DI	
338	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
339	IC-303	AERATION TANK 1 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
340	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
341	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-01	DI	
342	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
343	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-01	DI	
344	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
345	IC-303	AERATION TANK 1 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
346	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
347	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-01	DI	
348	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
349	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-01	DI	
350	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
351	IC-303	AERATION TANK 1 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
352	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
353	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-01	DI	
354	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
355	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-01	DI	
356	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
357	IC-303	AERATION TANK 1 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
358	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
359	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-01	DI	
360	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
361	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-01	DI	
362	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
363	IC-303	AERATION TANK 1 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
364	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	
365	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-01	DI	
366	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-01	DI	
367	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-01	DI	
368	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
369	IC-303	AERATION TANK 1 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
370	IC-303	AERATION TANK 1 ZONE 2 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
371	IC-303	AERATION TANK 1 ZONE 3 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
372	IC-303	AERATION TANK 1 ZONE 4 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
373	IC-303	AERATION TANK 1 ZONE 5 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
374	IC-303	AERATION TANK 1 ZONE 6 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
375	IC-303	AERATION TANK 1 ZONE 7 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
376	IC-303	AERATION TANK 1 ZONE 8 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
377	IC-304	AERATION TANK 2 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
378	IC-304	AERATION TANK 2 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
379	IC-304	AERATION TANK 2 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
380	IC-304	AERATION TANK 2 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
381	IC-304	AERATION TANK 2 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
382	IC-304	AERATION TANK 2 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
383	IC-304	AERATION TANK 2 IMLR PUMP - IN REMOTE	BATTERY E RIO-01	DI	-
384	IC-304	AERATION TANK 2 IMLR PUMP - RUNNING	BATTERY E RIO-01	DI	-
385	IC-304	AERATION TANK 2 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-01	DI	-
386	IC-304	AERATION TANK 2 IMLR PUMP - HIGH MOTOR TEMPTERATURE	BATTERY E RIO-01	DI	-
387	IC-304	AERATION TANK 2 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-01	DI	-
388	IC-304	AERATION TANK 2 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-01	DO	-
399	IC-304	AERATION TANK 2 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-01	AI	0 - 15 mg/L
400	IC-304	AERATION TANK 2 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
401	IC-304	AERATION TANK 2 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-01	AI	0 - 15 mg/L
402	IC-304	AERATION TANK 2 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
403	IC-304	AERATION TANK 2 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
404	IC-304	AERATION TANK 2 ANOXIC ZONE NITRATE LEVEL	BATTERY E RIO-01	AI	0 - 5 mg/L
405	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
406	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-01	DI	-

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407	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
408	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
409	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
410	IC-304	AERATION TANK 2 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
411	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
412	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
413	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
414	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
415	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
416	IC-304	AERATION TANK 2 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
417	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
418	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
419	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
420	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
421	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
422	IC-304	AERATION TANK 2 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
423	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
424	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
425	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
426	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
427	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
428	IC-304	AERATION TANK 2 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
429	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
430	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
431	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
432	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
433	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
434	IC-304	AERATION TANK 2 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
435	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
436	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
437	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
438	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
439	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
440	IC-304	AERATION TANK 2 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
441	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
442	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-01	DI	-
443	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
444	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-01	DI	-
445	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
446	IC-304	AERATION TANK 2 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
447	IC-304	AERATION TANK 2 ZONE 2 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
448	IC-304	AERATION TANK 2 ZONE 3 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
449	IC-304	AERATION TANK 2 ZONE 4 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
450	IC-304	AERATION TANK 2 ZONE 5 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
451	IC-304	AERATION TANK 2 ZONE 6 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
452	IC-304	AERATION TANK 2 ZONE 7 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
453	IC-304	AERATION TANK 2 ZONE 8 AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
760	IC-401	FERMENTER RAS PUMP 1 - VFD IN REMOTE	BATTERY E RIO-01	DI	-
761	IC-401	FERMENTER RAS PUMP 1 - LCS IN REMOTE	BATTERY E RIO-01	DI	-
762	IC-401	FERMENTER RAS PUMP 1 - RUNNING ON VFD	BATTERY E RIO-01	DI	-
763	IC-401	FERMENTER RAS PUMP 1 - IN BYPASS	BATTERY E RIO-01	DI	-
764	IC-401	FERMENTER RAS PUMP 1 - RUNNING IN BYPASS	BATTERY E RIO-01	DI	-
765	IC-401	FERMENTER RAS PUMP 1 - BYPASS OVERLOAD	BATTERY E RIO-01	DI	-
766	IC-401	FERMENTER RAS PUMP 1 - HIGH DISCHARGE PRESSURE	BATTERY E RIO-01	DI	-
767	IC-401	FERMENTER RAS PUMP 1 - MOTOR HIGH TEMPERATURE	BATTERY E RIO-01	DI	-
768	IC-401	FERMENTER RAS PUMP 1 - LOW SEAL WATER PRESSURE	BATTERY E RIO-01	DI	-
769	IC-401	FERMENTER RAS PUMP 1 - CONTROL POWER ON	BATTERY E RIO-01	DI	-
775	IC-401	FERMENTER RAS PUMP 2 - VFD IN REMOTE	BATTERY E RIO-01	DI	-
776	IC-401	FERMENTER RAS PUMP 2 - LCS IN REMOTE	BATTERY E RIO-01	DI	-
777	IC-401	FERMENTER RAS PUMP 2 - RUNNING ON VFD	BATTERY E RIO-01	DI	-
778	IC-401	FERMENTER RAS PUMP 2 - IN BYPASS	BATTERY E RIO-01	DI	-
779	IC-401	FERMENTER RAS PUMP 2 - RUNNING IN BYPASS	BATTERY E RIO-01	DI	-
780	IC-401	FERMENTER RAS PUMP 2 - BYPASS OVERLOAD	BATTERY E RIO-01	DI	-
781	IC-401	FERMENTER RAS PUMP 2 - HIGH DISCHARGE PRESSURE	BATTERY E RIO-01	DI	-

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782	IC-401	FERMENTER RAS PUMP 2 - MOTOR HIGH TEMPERATURE	BATTERY E RIO-01	DI	-
783	IC-401	FERMENTER RAS PUMP 2 - LOW SEAL WATER PRESSURE	BATTERY E RIO-01	DI	-
784	IC-401	FERMENTER RAS PUMP 2 - CONTROL POWER ON	BATTERY E RIO-01	DI	-
790	IC-401	FERMENTER RAS PUMP 3 - VFD IN REMOTE	BATTERY E RIO-01	DI	-
791	IC-401	FERMENTER RAS PUMP 3 - LCS IN REMOTE	BATTERY E RIO-01	DI	-
792	IC-401	FERMENTER RAS PUMP 3 - RUNNING ON VFD	BATTERY E RIO-01	DI	-
793	IC-401	FERMENTER RAS PUMP 3 - IN BYPASS	BATTERY E RIO-01	DI	-
794	IC-401	FERMENTER RAS PUMP 3 - RUNNING IN BYPASS	BATTERY E RIO-01	DI	-
795	IC-401	FERMENTER RAS PUMP 3 - BYPASS OVERLOAD	BATTERY E RIO-01	DI	-
796	IC-401	FERMENTER RAS PUMP 3 - HIGH DISCHARGE PRESSURE	BATTERY E RIO-01	DI	-
797	IC-401	FERMENTER RAS PUMP 3 - MOTOR HIGH TEMPERATURE	BATTERY E RIO-01	DI	-
798	IC-401	FERMENTER RAS PUMP 3 - LOW SEAL WATER PRESSURE	BATTERY E RIO-01	DI	-
799	IC-401	FERMENTER RAS PUMP 3 - CONTROL POWER ON	BATTERY E RIO-01	DI	-
805	IC-401	RAS PUMPS DISCHARGE FLOW	BATTERY E RIO-01	AI	0 - 20 MGD
806	IC-402	WAS PUMP 1 - LCS IN REMOTE	BATTERY E RIO-01	DI	-
807	IC-402	WAS PUMP 1 - RUNNING ON VFD	BATTERY E RIO-01	DI	-
808	IC-402	WAS PUMP 1 - IN BYPASS	BATTERY E RIO-01	DI	-
809	IC-402	WAS PUMP 1 - RUNNING IN BYPASS	BATTERY E RIO-01	DI	-
810	IC-402	WAS PUMP 1 - BYPASS OVERLOAD	BATTERY E RIO-01	DI	-
811	IC-402	WAS PUMP 1 - HIGH DISCHARGE PRESSURE	BATTERY E RIO-01	DI	-
812	IC-402	WAS PUMP 1 - MOTOR HIGH TEMPERATURE	BATTERY E RIO-01	DI	-
813	IC-402	WAS PUMP 1 - LOW SEAL WATER PRESSURE	BATTERY E RIO-01	DI	-
814	IC-402	WAS PUMP 1 - CONTROL POWER ON	BATTERY E RIO-01	DI	-
820	IC-402	WAS PUMP 2 - VFD IN REMOTE	BATTERY E RIO-01	DI	-
821	IC-402	WAS PUMP 2 - LCS IN REMOTE	BATTERY E RIO-01	DI	-
822	IC-402	WAS PUMP 2 - RUNNING ON VFD	BATTERY E RIO-01	DI	-
823	IC-402	WAS PUMP 2 - IN BYPASS	BATTERY E RIO-01	DI	-
824	IC-402	WAS PUMP 2 - RUNNING IN BYPASS	BATTERY E RIO-01	DI	-
825	IC-402	WAS PUMP 2 - BYPASS OVERLOAD	BATTERY E RIO-01	DI	-
826	IC-402	WAS PUMP 2 - HIGH DISCHARGE PRESSURE	BATTERY E RIO-01	DI	-
827	IC-402	WAS PUMP 2 - MOTOR HIGH TEMPERATURE	BATTERY E RIO-01	DI	-
828	IC-402	WAS PUMP 2 - LOW SEAL WATER PRESSURE	BATTERY E RIO-01	DI	-
829	IC-402	WAS PUMP 2 - CONTROL POWER ON	BATTERY E RIO-01	DI	-
835	IC-402	WAS PUMPS DISCHARGE FLOW	BATTERY E RIO-01	AI	0 - 200 MGD
836	IC-501	MIXED LIQUOR CHANNEL SUSPENDED SOLIDS NORTH	BATTERY E RIO-01	AI	0 - 10000 mg/L
837	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
838	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
839	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
840	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
841	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
842	IC-501	FINAL SETTLING TANK 1 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
843	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
844	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
845	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
846	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
847	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
848	IC-501	FINAL SETTLING TANK 2 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
849	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
850	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
851	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
852	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
853	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
854	IC-501	FINAL SETTLING TANK 3 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
855	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - IN REMOTE	BATTERY E RIO-01	DI	-
856	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - OPENED	BATTERY E RIO-01	DI	-
857	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - CLOSED	BATTERY E RIO-01	DI	-
858	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - FAULT	BATTERY E RIO-01	DI	-
859	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
860	IC-501	FINAL SETTLING TANK 4 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
861	IC-501	FINAL SETTLING TANK 1 DRIVE - IN REMOTE	BATTERY E RIO-01	DI	-
862	IC-501	FINAL SETTLING TANK 1 DRIVE - RUNNING	BATTERY E RIO-01	DI	-
863	IC-501	FINAL SETTLING TANK 1 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-01	DI	-
864	IC-501	FINAL SETTLING TANK 1 DRIVE - TORQUE WARNING	BATTERY E RIO-01	DI	-
865	IC-501	FINAL SETTLING TANK 1 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-01	DI	-

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866	IC-501	FINAL SETTLING TANK 1 DRIVE - LOW OIL LEVEL	BATTERY E RIO-01	DI	-
867	IC-501	FINAL SETTLING TANK 1 DRIVE - START/STOP COMMAND	BATTERY E RIO-01	DO	-
868	IC-501	FINAL SETTLING TANK 1 DRIVE - TORQUE	BATTERY E RIO-01	AI	0 - 100%
869	IC-501	FINAL SETTLING TANK 1 SLUDGE BLANKET LEVEL	BATTERY E RIO-01	AI	0 - 25 FT
870	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
871	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - IN REMOTE	BATTERY E RIO-01	DI	-
872	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - OPENED	BATTERY E RIO-01	DI	-
873	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - CLOSED	BATTERY E RIO-01	DI	-
874	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - FAULT	BATTERY E RIO-01	DI	-
875	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
876	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1A FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
877	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
878	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - IN REMOTE	BATTERY E RIO-01	DI	-
879	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - OPENED	BATTERY E RIO-01	DI	-
880	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - CLOSED	BATTERY E RIO-01	DI	-
881	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - FAULT	BATTERY E RIO-01	DI	-
882	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
883	IC-501	FINAL SETTLING TANK 1 AIR LIFT 1B FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
884	IC-502	FINAL SETTLING TANK 2 DRIVE - IN REMOTE	BATTERY E RIO-01	DI	-
885	IC-502	FINAL SETTLING TANK 2 DRIVE - RUNNING	BATTERY E RIO-01	DI	-
886	IC-502	FINAL SETTLING TANK 2 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-01	DI	-
887	IC-502	FINAL SETTLING TANK 2 DRIVE - TORQUE WARNING	BATTERY E RIO-01	DI	-
888	IC-502	FINAL SETTLING TANK 2 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-01	DI	-
889	IC-502	FINAL SETTLING TANK 2 DRIVE - LOW OIL LEVEL	BATTERY E RIO-01	DI	-
890	IC-502	FINAL SETTLING TANK 2 DRIVE - START/STOP COMMAND	BATTERY E RIO-01	DO	-
891	IC-502	FINAL SETTLING TANK 2 DRIVE - TORQUE	BATTERY E RIO-01	AI	0 - 100%
892	IC-502	FINAL SETTLING TANK 2 SLUDGE BLANKET LEVEL	BATTERY E RIO-01	AI	0 - 25 FT
893	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
894	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - IN REMOTE	BATTERY E RIO-01	DI	-
895	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - OPENED	BATTERY E RIO-01	DI	-
896	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - CLOSED	BATTERY E RIO-01	DI	-
897	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - FAULT	BATTERY E RIO-01	DI	-
898	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
899	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2A FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
900	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
901	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - IN REMOTE	BATTERY E RIO-01	DI	-
902	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - OPENED	BATTERY E RIO-01	DI	-
903	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - CLOSED	BATTERY E RIO-01	DI	-
904	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - FAULT	BATTERY E RIO-01	DI	-
905	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
906	IC-502	FINAL SETTLING TANK 2 AIR LIFT 2B FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
907	IC-503	FINAL SETTLING TANK 3 DRIVE - IN REMOTE	BATTERY E RIO-01	DI	-
908	IC-503	FINAL SETTLING TANK 3 DRIVE - RUNNING	BATTERY E RIO-01	DI	-
909	IC-503	FINAL SETTLING TANK 3 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-01	DI	-
910	IC-503	FINAL SETTLING TANK 3 DRIVE - TORQUE WARNING	BATTERY E RIO-01	DI	-
911	IC-503	FINAL SETTLING TANK 3 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-01	DI	-
912	IC-503	FINAL SETTLING TANK 3 DRIVE - LOW OIL LEVEL	BATTERY E RIO-01	DI	-
913	IC-503	FINAL SETTLING TANK 3 DRIVE - START/STOP COMMAND	BATTERY E RIO-01	DO	-
914	IC-503	FINAL SETTLING TANK 3 DRIVE - TORQUE	BATTERY E RIO-01	AI	0 - 100%
915	IC-503	FINAL SETTLING TANK 3 SLUDGE BLANKET LEVEL	BATTERY E RIO-01	AI	0 - 25 FT
916	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
917	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - IN REMOTE	BATTERY E RIO-01	DI	-
918	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - OPENED	BATTERY E RIO-01	DI	-
919	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - CLOSED	BATTERY E RIO-01	DI	-
920	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - FAULT	BATTERY E RIO-01	DI	-
921	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
922	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3A FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
923	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
924	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - IN REMOTE	BATTERY E RIO-01	DI	-
925	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - OPENED	BATTERY E RIO-01	DI	-
926	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - CLOSED	BATTERY E RIO-01	DI	-
927	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - FAULT	BATTERY E RIO-01	DI	-
928	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
929	IC-503	FINAL SETTLING TANK 3 AIR LIFT 3B FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%

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930	IC-504	FINAL SETTLING TANK 4 DRIVE - IN REMOTE	BATTERY E RIO-01	DI	-
931	IC-504	FINAL SETTLING TANK 4 DRIVE - RUNNING	BATTERY E RIO-01	DI	-
932	IC-504	FINAL SETTLING TANK 4 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-01	DI	-
933	IC-504	FINAL SETTLING TANK 4 DRIVE - TORQUE WARNING	BATTERY E RIO-01	DI	-
934	IC-504	FINAL SETTLING TANK 4 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-01	DI	-
935	IC-504	FINAL SETTLING TANK 4 DRIVE - LOW OIL LEVEL	BATTERY E RIO-01	DI	-
936	IC-504	FINAL SETTLING TANK 4 DRIVE - START/STOP COMMAND	BATTERY E RIO-01	DO	-
937	IC-504	FINAL SETTLING TANK 4 DRIVE - TORQUE	BATTERY E RIO-01	AI	0 - 100%
938	IC-504	FINAL SETTLING TANK 4 SLUDGE BLANKET LEVEL	BATTERY E RIO-01	AI	0 - 25 FT
939	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
940	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - IN REMOTE	BATTERY E RIO-01	DI	-
941	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - OPENED	BATTERY E RIO-01	DI	-
942	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - CLOSED	BATTERY E RIO-01	DI	-
943	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - FAULT	BATTERY E RIO-01	DI	-
944	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
945	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4A FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
946	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B AIR FLOW	BATTERY E RIO-01	AI	0 - 1500 SCFM
947	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - IN REMOTE	BATTERY E RIO-01	DI	-
948	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - OPENED	BATTERY E RIO-01	DI	-
949	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - CLOSED	BATTERY E RIO-01	DI	-
950	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - FAULT	BATTERY E RIO-01	DI	-
951	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
952	IC-504	FINAL SETTLING TANK 4 AIR LIFT 4B FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
1070	IC-601	POST-AERATION WEST CHANNEL INLET GATE - IN REMOTE	BATTERY E RIO-01	DI	-
1071	IC-601	POST-AERATION WEST CHANNEL INLET GATE - OPENED	BATTERY E RIO-01	DI	-
1072	IC-601	POST-AERATION WEST CHANNEL INLET GATE - CLOSED	BATTERY E RIO-01	DI	-
1073	IC-601	POST-AERATION WEST CHANNEL INLET GATE - FAULT	BATTERY E RIO-01	DI	-
1074	IC-601	POST-AERATION WEST CHANNEL INLET GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
1075	IC-601	POST-AERATION WEST CHANNEL INLET GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1076	IC-601	POST-AERATION EAST CHANNEL INLET GATE - IN REMOTE	BATTERY E RIO-01	DI	-
1077	IC-601	POST-AERATION EAST CHANNEL INLET GATE - OPENED	BATTERY E RIO-01	DI	-
1078	IC-601	POST-AERATION EAST CHANNEL INLET GATE - CLOSED	BATTERY E RIO-01	DI	-
1079	IC-601	POST-AERATION EAST CHANNEL INLET GATE - FAULT	BATTERY E RIO-01	DI	-
1080	IC-601	POST-AERATION EAST CHANNEL INLET GATE - OPEN COMMAND	BATTERY E RIO-01	DO	-
1081	IC-601	POST-AERATION EAST CHANNEL INLET GATE - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1082	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - IN REMOTE	BATTERY E RIO-01	DI	-
1083	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - OPENED	BATTERY E RIO-01	DI	-
1084	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - CLOSED	BATTERY E RIO-01	DI	-
1085	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - FAULT	BATTERY E RIO-01	DI	-
1086	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - OPEN COMMAND	BATTERY E RIO-01	DO	-
1087	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE A - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1088	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - IN REMOTE	BATTERY E RIO-01	DI	-
1089	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - OPENED	BATTERY E RIO-01	DI	-
1090	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - CLOSED	BATTERY E RIO-01	DI	-
1091	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - FAULT	BATTERY E RIO-01	DI	-
1092	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - OPEN COMMAND	BATTERY E RIO-01	DO	-
1093	IC-601	POST-AERATION WEST CHANNEL OUTLET GATE B - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1094	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - IN REMOTE	BATTERY E RIO-01	DI	-
1095	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - OPENED	BATTERY E RIO-01	DI	-
1096	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - CLOSED	BATTERY E RIO-01	DI	-
1097	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - FAULT	BATTERY E RIO-01	DI	-
1098	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - OPEN COMMAND	BATTERY E RIO-01	DO	-
1099	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE A - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1100	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - IN REMOTE	BATTERY E RIO-01	DI	-
1101	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - OPENED	BATTERY E RIO-01	DI	-
1102	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - CLOSED	BATTERY E RIO-01	DI	-
1103	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - FAULT	BATTERY E RIO-01	DI	-
1104	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - OPEN COMMAND	BATTERY E RIO-01	DO	-
1105	IC-601	POST-AERATION EAST CHANNEL OUTLET GATE B - CLOSE COMMAND	BATTERY E RIO-01	DO	-
1106	IC-601	EFFLUENT SAMPLE PUMP 1 - OVERLOAD	BATTERY E RIO-01	DI	-
1107	IC-601	EFFLUENT SAMPLE PUMP 1 - RUNNING	BATTERY E RIO-01	DI	-
1110	IC-601	POST-AERATION WEST CHANNEL DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
1111	IC-601	POST-AERATION EAST CHANNEL DISSOLVED OXYGEN LEVEL	BATTERY E RIO-01	AI	0 - 10 mg/L
1112	IC-601	EFFLUENT SAMPLER 1 TURBIDITY	BATTERY E RIO-01	AI	0 - 2000 NTU

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1113	IC-601	EFFLUENT SAMPLER 1 NITRITE LEVEL	BATTERY E RIO-01	AI	0 - 5 mg/L
1114	IC-601	EFFLUENT SAMPLER 1 NITRATE LEVEL	BATTERY E RIO-01	AI	0 - 20 mg/L
1115	IC-601	EFFLUENT SAMPLER 1 AMMONIA LEVEL	BATTERY E RIO-01	AI	0 - 20 mg/L
1116	IC-601	EFFLUENT SAMPLER 1 PHOSPHATE LEVEL	BATTERY E RIO-01	AI	0 - 5 mg/L
1122	IC-601	POST-AERATION TANK AIR FLOW	BATTERY E RIO-01	AI	0 - 2500 SCFM
1123	IC-601	POST-AERATION TANK AIR FCV - IN REMOTE	BATTERY E RIO-01	DI	-
1124	IC-601	POST-AERATION TANK AIR FCV - OPENED	BATTERY E RIO-01	DI	-
1125	IC-601	POST-AERATION TANK AIR FCV - CLOSED	BATTERY E RIO-01	DI	-
1126	IC-601	POST-AERATION TANK AIR FCV - FAULT	BATTERY E RIO-01	DI	-
1127	IC-601	POST-AERATION TANK AIR FCV - POSITION COMMAND	BATTERY E RIO-01	AO	0 - 100%
1128	IC-601	POST-AERATION TANK AIR FCV - POSITION FEEDBACK	BATTERY E RIO-01	AI	0 - 100%
20	IC-005	MAKEUP AIR UNIT 2 - RUNNING	BATTERY E RIO-02	DI	-
21	IC-005	MAKEUP AIR UNIT 2 - GENERAL ALARM	BATTERY E RIO-02	DI	-
22	IC-105	MAKEUP AIR UNIT 2 - TEMPERATURE	BATTERY E RIO-02	AI	32-100 DEGREES F
32	IC-005	SUMP PUMP 2 - PUMP A RUNNING	BATTERY E RIO-02	DI	-
33	IC-005	SUMP PUMP 2 - PUMP B RUNNING	BATTERY E RIO-02	DI	-
34	IC-005	SUMP PUMP 2 - HIGH LEVEL ALARM	BATTERY E RIO-02	DI	-
60	IC-006	GALLERY - BASEMENT SOUTH HEAT ALARM	BATTERY E RIO-02	DI	-
62	IC-006	GALLERY - UPPER LEVEL TEMPERATURE SOUTH	BATTERY E RIO-02	RTD	32-100 DEGREES F
454	IC-305	AERATION TANK 3 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
455	IC-305	AERATION TANK 3 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
456	IC-305	AERATION TANK 3 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
457	IC-305	AERATION TANK 3 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
458	IC-305	AERATION TANK 3 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
459	IC-305	AERATION TANK 3 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
460	IC-305	AERATION TANK 3 IMLR PUMP - IN REMOTE	BATTERY E RIO-02	DI	-
461	IC-305	AERATION TANK 3 IMLR PUMP - RUNNING	BATTERY E RIO-02	DI	-
462	IC-305	AERATION TANK 3 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-02	DI	-
463	IC-305	AERATION TANK 3 IMLR PUMP - HIGH MOTOR TEMPERATURE	BATTERY E RIO-02	DI	-
464	IC-305	AERATION TANK 3 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-02	DI	-
465	IC-305	AERATION TANK 3 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-02	DO	-
476	IC-305	AERATION TANK 3 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
477	IC-305	AERATION TANK 3 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
478	IC-305	AERATION TANK 3 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
479	IC-305	AERATION TANK 3 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
480	IC-305	AERATION TANK 3 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
481	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
482	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
483	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
484	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
485	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
486	IC-305	AERATION TANK 3 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
487	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
488	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
489	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
490	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
491	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
492	IC-305	AERATION TANK 3 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
493	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
494	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
495	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
496	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
497	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
498	IC-305	AERATION TANK 3 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
499	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
500	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
501	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
502	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
503	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
504	IC-305	AERATION TANK 3 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
505	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
506	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
507	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
508	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-02	DI	-

HARD I/O

509	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
510	IC-305	AERATION TANK 3 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
511	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
512	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
513	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
514	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
515	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
516	IC-305	AERATION TANK 3 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
517	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
518	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
519	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
520	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
521	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
522	IC-305	AERATION TANK 3 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
523	IC-305	AERATION TANK 3 ZONE 2 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
524	IC-305	AERATION TANK 3 ZONE 3 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
525	IC-305	AERATION TANK 3 ZONE 4 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
526	IC-305	AERATION TANK 3 ZONE 5 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
527	IC-305	AERATION TANK 3 ZONE 6 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
528	IC-305	AERATION TANK 3 ZONE 7 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
529	IC-305	AERATION TANK 3 ZONE 8 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
530	IC-306	AERATION TANK 4 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
531	IC-306	AERATION TANK 4 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
532	IC-306	AERATION TANK 4 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
533	IC-306	AERATION TANK 4 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
534	IC-306	AERATION TANK 4 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
535	IC-306	AERATION TANK 4 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
536	IC-306	AERATION TANK 4 IMLR PUMP - IN REMOTE	BATTERY E RIO-02	DI	-
537	IC-306	AERATION TANK 4 IMLR PUMP - RUNNING	BATTERY E RIO-02	DI	-
538	IC-306	AERATION TANK 4 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-02	DI	-
539	IC-306	AERATION TANK 4 IMLR PUMP - HIGH MOTOR TEMPERATURE	BATTERY E RIO-02	DI	-
540	IC-306	AERATION TANK 4 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-02	DI	-
541	IC-306	AERATION TANK 4 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-02	DO	-
552	IC-306	AERATION TANK 4 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
553	IC-306	AERATION TANK 4 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
554	IC-306	AERATION TANK 4 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
555	IC-306	AERATION TANK 4 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
556	IC-306	AERATION TANK 4 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
557	IC-306	AERATION TANK 4 ANOXIC ZONE NITRATE LEVEL	BATTERY E RIO-02	AI	0 - 5 mg/L
558	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
559	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
560	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
561	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
562	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
563	IC-306	AERATION TANK 4 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
564	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
565	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
566	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
567	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
568	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
569	IC-306	AERATION TANK 4 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
570	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
571	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
572	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
573	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
574	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
575	IC-306	AERATION TANK 4 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
576	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
577	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
578	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
579	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
580	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
581	IC-306	AERATION TANK 4 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
582	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-

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583	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
584	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
585	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
586	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
587	IC-306	AERATION TANK 4 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
588	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
589	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
590	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
591	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
592	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
593	IC-306	AERATION TANK 4 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
594	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
595	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
596	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
597	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
598	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
599	IC-306	AERATION TANK 4 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
600	IC-306	AERATION TANK 4 ZONE 2 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
601	IC-306	AERATION TANK 4 ZONE 3 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
602	IC-306	AERATION TANK 4 ZONE 4 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
603	IC-306	AERATION TANK 4 ZONE 5 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
604	IC-306	AERATION TANK 4 ZONE 6 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
605	IC-306	AERATION TANK 4 ZONE 7 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
606	IC-306	AERATION TANK 4 ZONE 8 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
607	IC-307	AERATION TANK 5 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
608	IC-307	AERATION TANK 5 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
609	IC-307	AERATION TANK 5 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
610	IC-307	AERATION TANK 5 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
611	IC-307	AERATION TANK 5 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
612	IC-307	AERATION TANK 5 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
613	IC-307	AERATION TANK 5 IMLR PUMP - IN REMOTE	BATTERY E RIO-02	DI	-
614	IC-307	AERATION TANK 5 IMLR PUMP - RUNNING	BATTERY E RIO-02	DI	-
615	IC-307	AERATION TANK 5 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-02	DI	-
616	IC-307	AERATION TANK 5 IMLR PUMP - HIGH MOTOR TEMPERATURE	BATTERY E RIO-02	DI	-
617	IC-307	AERATION TANK 5 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-02	DI	-
618	IC-307	AERATION TANK 5 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-02	DO	-
629	IC-307	AERATION TANK 5 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
630	IC-307	AERATION TANK 5 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
631	IC-307	AERATION TANK 5 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
632	IC-307	AERATION TANK 5 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
633	IC-307	AERATION TANK 5 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
634	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
635	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
636	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
637	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
638	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
639	IC-307	AERATION TANK 5 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
640	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
641	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
642	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
643	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
644	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
645	IC-307	AERATION TANK 5 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
646	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
647	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
648	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
649	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
650	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
651	IC-307	AERATION TANK 5 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
652	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
653	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
654	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
655	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
656	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%

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657	IC-307	AERATION TANK 5 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
658	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
659	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
660	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
661	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
662	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
663	IC-307	AERATION TANK 5 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
664	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
665	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
666	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
667	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
668	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
669	IC-307	AERATION TANK 5 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
670	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
671	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
672	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
673	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
674	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
675	IC-307	AERATION TANK 5 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
676	IC-307	AERATION TANK 5 ZONE 2 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
677	IC-307	AERATION TANK 5 ZONE 3 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
678	IC-307	AERATION TANK 5 ZONE 4 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
679	IC-307	AERATION TANK 5 ZONE 5 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
680	IC-307	AERATION TANK 5 ZONE 6 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
681	IC-307	AERATION TANK 5 ZONE 7 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
682	IC-307	AERATION TANK 5 ZONE 8 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
683	IC-308	AERATION TANK 6 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
684	IC-308	AERATION TANK 6 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
685	IC-308	AERATION TANK 6 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
686	IC-308	AERATION TANK 6 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
687	IC-308	AERATION TANK 6 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
688	IC-308	AERATION TANK 6 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
689	IC-308	AERATION TANK 6 IMLR PUMP - IN REMOTE	BATTERY E RIO-02	DI	-
690	IC-308	AERATION TANK 6 IMLR PUMP - RUNNING	BATTERY E RIO-02	DI	-
691	IC-308	AERATION TANK 6 IMLR PUMP - MOTOR OVERLOAD	BATTERY E RIO-02	DI	-
692	IC-308	AERATION TANK 6 IMLR PUMP - HIGH MOTOR TEMPTERATURE	BATTERY E RIO-02	DI	-
693	IC-308	AERATION TANK 6 IMLR PUMP - MOISTURE IN MOTOR	BATTERY E RIO-02	DI	-
694	IC-308	AERATION TANK 6 IMLR PUMP - START/STOP COMMAND	BATTERY E RIO-02	DO	-
705	IC-308	AERATION TANK 6 ZONE 3 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
706	IC-308	AERATION TANK 6 ZONE 3 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
707	IC-308	AERATION TANK 6 ZONE 5 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 15 mg/L
708	IC-308	AERATION TANK 6 ZONE 5 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
709	IC-308	AERATION TANK 6 ZONE 7 DISSOLVED OXYGEN LEVEL	BATTERY E RIO-02	AI	0 - 10 mg/L
710	IC-308	AERATION TANK 6 ANOXIC ZONE NITRATE LEVEL	BATTERY E RIO-02	AI	0 - 5 mg/L
711	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
712	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
713	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
714	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
715	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
716	IC-308	AERATION TANK 6 ZONE 2 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
717	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
718	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
719	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
720	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
721	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
722	IC-308	AERATION TANK 6 ZONE 3 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
723	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
724	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
725	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
726	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
727	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
728	IC-308	AERATION TANK 6 ZONE 4 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
729	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
730	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - OPENED	BATTERY E RIO-02	DI	-

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731	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
732	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
733	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
734	IC-308	AERATION TANK 6 ZONE 5 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
735	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
736	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
737	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
738	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
739	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
740	IC-308	AERATION TANK 6 ZONE 6 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
741	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
742	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
743	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
744	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
745	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
746	IC-308	AERATION TANK 6 ZONE 7 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
747	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - IN REMOTE	BATTERY E RIO-02	DI	-
748	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - OPENED	BATTERY E RIO-02	DI	-
749	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - CLOSED	BATTERY E RIO-02	DI	-
750	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - FAULT	BATTERY E RIO-02	DI	-
751	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
752	IC-308	AERATION TANK 6 ZONE 8 AIR FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
753	IC-308	AERATION TANK 6 ZONE 2 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
754	IC-308	AERATION TANK 6 ZONE 3 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
755	IC-308	AERATION TANK 6 ZONE 4 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
756	IC-308	AERATION TANK 6 ZONE 5 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
757	IC-308	AERATION TANK 6 ZONE 6 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
758	IC-308	AERATION TANK 6 ZONE 7 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
759	IC-308	AERATION TANK 6 ZONE 8 AIR FLOW	BATTERY E RIO-02	AI	0 - 2500 SCFM
953	IC-505	MIXED LIQUOR CHANNEL SUSPENDED SOLIDS SOUTH	BATTERY E RIO-02	AI	0 - 10000 mg/L
954	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
955	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
956	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
957	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
958	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
959	IC-505	FINAL SETTLING TANK 5 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
960	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
961	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
962	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
963	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
964	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
965	IC-505	FINAL SETTLING TANK 6 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
966	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
967	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
968	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
969	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
970	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
971	IC-505	FINAL SETTLING TANK 7 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
972	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - IN REMOTE	BATTERY E RIO-02	DI	-
973	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - OPENED	BATTERY E RIO-02	DI	-
974	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - CLOSED	BATTERY E RIO-02	DI	-
975	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - FAULT	BATTERY E RIO-02	DI	-
976	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - OPEN COMMAND	BATTERY E RIO-02	DO	-
977	IC-505	FINAL SETTLING TANK 8 INFLUENT GATE - CLOSE COMMAND	BATTERY E RIO-02	DO	-
978	IC-505	FINAL SETTLING TANK 5 DRIVE - IN REMOTE	BATTERY E RIO-02	DI	-
979	IC-505	FINAL SETTLING TANK 5 DRIVE - RUNNING	BATTERY E RIO-02	DI	-
980	IC-505	FINAL SETTLING TANK 5 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-02	DI	-
981	IC-505	FINAL SETTLING TANK 5 DRIVE - TORQUE WARNING	BATTERY E RIO-02	DI	-
982	IC-505	FINAL SETTLING TANK 5 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-02	DI	-
983	IC-505	FINAL SETTLING TANK 5 DRIVE - LOW OIL LEVEL	BATTERY E RIO-02	DI	-
984	IC-505	FINAL SETTLING TANK 5 DRIVE - START/STOP COMMAND	BATTERY E RIO-02	DO	-
985	IC-505	FINAL SETTLING TANK 5 DRIVE - TORQUE	BATTERY E RIO-02	AI	0 - 100%
986	IC-505	FINAL SETTLING TANK 5 SLUDGE BLANKET LEVEL	BATTERY E RIO-02	AI	0 - 25 FT
987	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM

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988	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - IN REMOTE	BATTERY E RIO-02	DI	-
989	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - OPENED	BATTERY E RIO-02	DI	-
990	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - CLOSED	BATTERY E RIO-02	DI	-
991	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - FAULT	BATTERY E RIO-02	DI	-
992	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
993	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5A FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
994	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
995	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - IN REMOTE	BATTERY E RIO-02	DI	-
996	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - OPENED	BATTERY E RIO-02	DI	-
997	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - CLOSED	BATTERY E RIO-02	DI	-
998	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - FAULT	BATTERY E RIO-02	DI	-
999	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1000	IC-505	FINAL SETTLING TANK 5 AIR LIFT 5B FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1001	IC-506	FINAL SETTLING TANK 6 DRIVE - IN REMOTE	BATTERY E RIO-02	DI	-
1002	IC-506	FINAL SETTLING TANK 6 DRIVE - RUNNING	BATTERY E RIO-02	DI	-
1003	IC-506	FINAL SETTLING TANK 6 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-02	DI	-
1004	IC-506	FINAL SETTLING TANK 6 DRIVE - TORQUE WARNING	BATTERY E RIO-02	DI	-
1005	IC-506	FINAL SETTLING TANK 6 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-02	DI	-
1006	IC-506	FINAL SETTLING TANK 6 DRIVE - LOW OIL LEVEL	BATTERY E RIO-02	DI	-
1007	IC-506	FINAL SETTLING TANK 6 DRIVE - START/STOP COMMAND	BATTERY E RIO-02	DO	-
1008	IC-506	FINAL SETTLING TANK 6 DRIVE - TORQUE	BATTERY E RIO-02	AI	0 - 100%
1009	IC-506	FINAL SETTLING TANK 6 SLUDGE BLANKET LEVEL	BATTERY E RIO-02	AI	0 - 25 FT
1010	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1011	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1012	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - OPENED	BATTERY E RIO-02	DI	-
1013	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - CLOSED	BATTERY E RIO-02	DI	-
1014	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - FAULT	BATTERY E RIO-02	DI	-
1015	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1016	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6A FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1017	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1018	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1019	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - OPENED	BATTERY E RIO-02	DI	-
1020	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - CLOSED	BATTERY E RIO-02	DI	-
1021	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - FAULT	BATTERY E RIO-02	DI	-
1022	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1023	IC-506	FINAL SETTLING TANK 6 AIR LIFT 6B FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1024	IC-507	FINAL SETTLING TANK 7 DRIVE - IN REMOTE	BATTERY E RIO-02	DI	-
1025	IC-507	FINAL SETTLING TANK 7 DRIVE - RUNNING	BATTERY E RIO-02	DI	-
1026	IC-507	FINAL SETTLING TANK 7 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-02	DI	-
1027	IC-507	FINAL SETTLING TANK 7 DRIVE - TORQUE WARNING	BATTERY E RIO-02	DI	-
1028	IC-507	FINAL SETTLING TANK 7 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-02	DI	-
1029	IC-507	FINAL SETTLING TANK 7 DRIVE - LOW OIL LEVEL	BATTERY E RIO-02	DI	-
1030	IC-507	FINAL SETTLING TANK 7 DRIVE - START/STOP COMMAND	BATTERY E RIO-02	DO	-
1031	IC-507	FINAL SETTLING TANK 7 DRIVE - TORQUE	BATTERY E RIO-02	AI	0 - 100%
1032	IC-507	FINAL SETTLING TANK 7 SLUDGE BLANKET LEVEL	BATTERY E RIO-02	AI	0 - 25 FT
1033	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1034	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1035	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - OPENED	BATTERY E RIO-02	DI	-
1036	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - CLOSED	BATTERY E RIO-02	DI	-
1037	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - FAULT	BATTERY E RIO-02	DI	-
1038	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1039	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7A FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1040	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1041	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1042	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - OPENED	BATTERY E RIO-02	DI	-
1043	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - CLOSED	BATTERY E RIO-02	DI	-
1044	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - FAULT	BATTERY E RIO-02	DI	-
1045	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1046	IC-507	FINAL SETTLING TANK 7 AIR LIFT 7B FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1047	IC-508	FINAL SETTLING TANK 8 DRIVE - IN REMOTE	BATTERY E RIO-02	DI	-
1048	IC-508	FINAL SETTLING TANK 8 DRIVE - RUNNING	BATTERY E RIO-02	DI	-
1049	IC-508	FINAL SETTLING TANK 8 DRIVE - DRIVE OVERLOAD	BATTERY E RIO-02	DI	-
1050	IC-508	FINAL SETTLING TANK 8 DRIVE - TORQUE WARNING	BATTERY E RIO-02	DI	-
1051	IC-508	FINAL SETTLING TANK 8 DRIVE - TORQUE SHUTDOWN	BATTERY E RIO-02	DI	-

HARD I/O

1052	IC-508	FINAL SETTLING TANK 8 DRIVE - LOW OIL LEVEL	BATTERY E RIO-02	DI	-
1053	IC-508	FINAL SETTLING TANK 8 DRIVE - START/STOP COMMAND	BATTERY E RIO-02	DO	-
1054	IC-508	FINAL SETTLING TANK 8 DRIVE - TORQUE	BATTERY E RIO-02	AI	0 - 100%
1055	IC-508	FINAL SETTLING TANK 8 SLUDGE BLANKET LEVEL	BATTERY E RIO-02	AI	0 - 25 FT
1056	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1057	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1058	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - OPENED	BATTERY E RIO-02	DI	-
1059	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - CLOSED	BATTERY E RIO-02	DI	-
1060	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - FAULT	BATTERY E RIO-02	DI	-
1061	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1062	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8A FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1063	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B AIR FLOW	BATTERY E RIO-02	AI	0 - 1500 SCFM
1064	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - IN REMOTE	BATTERY E RIO-02	DI	-
1065	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - OPENED	BATTERY E RIO-02	DI	-
1066	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - CLOSED	BATTERY E RIO-02	DI	-
1067	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - FAULT	BATTERY E RIO-02	DI	-
1068	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - POSITION COMMAND	BATTERY E RIO-02	AO	0 - 100%
1069	IC-508	FINAL SETTLING TANK 8 AIR LIFT 8B FCV - POSITION FEEDBACK	BATTERY E RIO-02	AI	0 - 100%
1108	IC-601	EFFLUENT SAMPLE PUMP 2 - OVERLOAD	BATTERY E RIO-02	DI	-
1109	IC-601	EFFLUENT SAMPLE PUMP 2 - RUNNING	BATTERY E RIO-02	DI	-
1117	IC-601	EFFLUENT SAMPLER 2 TURBIDITY	BATTERY E RIO-02	AI	0 - 2000 NTU
1118	IC-601	EFFLUENT SAMPLER 2 NITRITE LEVEL	BATTERY E RIO-02	AI	0 - 5 mg/L
1119	IC-601	EFFLUENT SAMPLER 2 NITRATE LEVEL	BATTERY E RIO-02	AI	0 - 20 mg/L
1120	IC-601	EFFLUENT SAMPLER 2 AMMONIA LEVEL	BATTERY E RIO-02	AI	0 - 20 mg/L
1121	IC-601	EFFLUENT SAMPLER 2 PHOSPHATE LEVEL	BATTERY E RIO-02	AI	0 - 5 mg/L
121	IC-101	BATTERY E INFLUENT FLOW	METER BUILDING	AI	0 - 200 MGD
122	IC-101	BATTERY E INFLUENT FCV - IN REMOTE	METER BUILDING	DI	-
123	IC-101	BATTERY E INFLUENT FCV - OPENED	METER BUILDING	DI	-
124	IC-101	BATTERY E INFLUENT FCV - CLOSED	METER BUILDING	DI	-
125	IC-101	BATTERY E INFLUENT FCV - FAULT	METER BUILDING	DI	-
126	IC-101	BATTERY E INFLUENT FCV - POSITION COMMAND	METER BUILDING	AO	0 - 100%
127	IC-101	BATTERY E INFLUENT FCV - POSITION FEEDBACK	METER BUILDING	AI	0 - 100%
50	IC-005	PCB BUS 1 TRANSFORMER 12 DISCONNECT OPEN	PCB	DI	-
51	IC-005	PCB BUS 1 TRANSFORMER 12 DISCONNECT CLOSED	PCB	DI	-
52	IC-005	PCB BUS 1 BATTERY E DISCONNECT OPEN	PCB	DI	-
53	IC-005	PCB BUS 1 BATTERY E DISCONNECT CLOSED	PCB	DI	-
54	IC-005	PCB BUS 2 TRANSFORMER 11 DISCONNECT OPEN	PCB	DI	-
55	IC-005	PCB BUS 2 TRANSFORMER 11 DISCONNECT CLOSED	PCB	DI	-
56	IC-005	PCB BUS 2 BATTERY E DISCONNECT OPEN	PCB	DI	-
57	IC-005	PCB BUS 2 BATTERY E DISCONNECT CLOSED	PCB	DI	-

Attachment 4

Soft I/O List

SOFT I/O

#	SHEET	POINT DESCRIPTION	I/O LOCATION	SIGNAL TYPE	RANGE
9	IC-002	BATTERY E MDP-E1 VOLTAGE PER PHASE FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
10	IC-002	BATTERY E MDP-E1 CURRENT PER PHASE FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
11	IC-002	BATTERY E MDP-E1 POWER FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
12	IC-002	BATTERY E MDP-E1 POWER FACTOR FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
13	IC-002	BATTERY E MDP-E2 VOLTAGE PER PHASE FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
14	IC-002	BATTERY E MDP-E2 CURRENT PER PHASE FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
15	IC-002	BATTERY E MDP-E2 POWER FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
16	IC-002	BATTERY E MDP-E2 POWER FACTOR FROM POWER MONITOR	BATTERY E RIO-01	COMM	PER MANUFACTURER
141	IC-301	FERMENTER RAS MIXER 1 - IN REMOTE	BATTERY E RIO-01	COMM	-
142	IC-301	FERMENTER RAS MIXER 1 - RUNNING	BATTERY E RIO-01	COMM	-
143	IC-301	FERMENTER RAS MIXER 1 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
144	IC-301	FERMENTER RAS MIXER 1 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
145	IC-301	FERMENTER RAS MIXER 1 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
146	IC-301	FERMENTER RAS MIXER 1 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
147	IC-301	FERMENTER RAS MIXER 1 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
148	IC-301	FERMENTER RAS MIXER 2 - IN REMOTE	BATTERY E RIO-01	COMM	-
149	IC-301	FERMENTER RAS MIXER 2 - RUNNING	BATTERY E RIO-01	COMM	-
150	IC-301	FERMENTER RAS MIXER 2 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
151	IC-301	FERMENTER RAS MIXER 2 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
152	IC-301	FERMENTER RAS MIXER 2 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
153	IC-301	FERMENTER RAS MIXER 2 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
154	IC-301	FERMENTER RAS MIXER 2 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
155	IC-301	FERMENTER RAS MIXER 3 - IN REMOTE	BATTERY E RIO-01	COMM	-
156	IC-301	FERMENTER RAS MIXER 3 - RUNNING	BATTERY E RIO-01	COMM	-
157	IC-301	FERMENTER RAS MIXER 3 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
158	IC-301	FERMENTER RAS MIXER 3 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
159	IC-301	FERMENTER RAS MIXER 3 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
160	IC-301	FERMENTER RAS MIXER 3 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
161	IC-301	FERMENTER RAS MIXER 3 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
162	IC-301	FERMENTER RAS MIXER 4 - IN REMOTE	BATTERY E RIO-01	COMM	-
163	IC-301	FERMENTER RAS MIXER 4 - RUNNING	BATTERY E RIO-01	COMM	-
164	IC-301	FERMENTER RAS MIXER 4 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
165	IC-301	FERMENTER RAS MIXER 4 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
166	IC-301	FERMENTER RAS MIXER 4 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
167	IC-301	FERMENTER RAS MIXER 4 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
168	IC-301	FERMENTER RAS MIXER 4 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
169	IC-301	FERMENTER RAS MIXER 5 - IN REMOTE	BATTERY E RIO-01	COMM	-
170	IC-301	FERMENTER RAS MIXER 5 - RUNNING	BATTERY E RIO-01	COMM	-
171	IC-301	FERMENTER RAS MIXER 5 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
172	IC-301	FERMENTER RAS MIXER 5 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
173	IC-301	FERMENTER RAS MIXER 5 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
174	IC-301	FERMENTER RAS MIXER 5 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
175	IC-301	FERMENTER RAS MIXER 5 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
176	IC-301	FERMENTER RAS MIXER 6 - IN REMOTE	BATTERY E RIO-01	COMM	-
177	IC-301	FERMENTER RAS MIXER 6 - RUNNING	BATTERY E RIO-01	COMM	-
178	IC-301	FERMENTER RAS MIXER 6 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
179	IC-301	FERMENTER RAS MIXER 6 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
180	IC-301	FERMENTER RAS MIXER 6 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
181	IC-301	FERMENTER RAS MIXER 6 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
182	IC-301	FERMENTER RAS MIXER 6 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
183	IC-301	FERMENTER RAS MIXER 7 - IN REMOTE	BATTERY E RIO-01	COMM	-
184	IC-301	FERMENTER RAS MIXER 7 - RUNNING	BATTERY E RIO-01	COMM	-
185	IC-301	FERMENTER RAS MIXER 7 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
186	IC-301	FERMENTER RAS MIXER 7 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
187	IC-301	FERMENTER RAS MIXER 7 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
188	IC-301	FERMENTER RAS MIXER 7 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
189	IC-301	FERMENTER RAS MIXER 7 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
190	IC-301	FERMENTER RAS MIXER 8 - IN REMOTE	BATTERY E RIO-01	COMM	-
191	IC-301	FERMENTER RAS MIXER 8 - RUNNING	BATTERY E RIO-01	COMM	-
192	IC-301	FERMENTER RAS MIXER 8 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
193	IC-301	FERMENTER RAS MIXER 8 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
194	IC-301	FERMENTER RAS MIXER 8 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
195	IC-301	FERMENTER RAS MIXER 8 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
196	IC-301	FERMENTER RAS MIXER 8 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
197	IC-301	FERMENTER RAS MIXER 9 - IN REMOTE	BATTERY E RIO-01	COMM	-
198	IC-301	FERMENTER RAS MIXER 9 - RUNNING	BATTERY E RIO-01	COMM	-

SOFT I/O

199	IC-301	FERMENTER RAS MIXER 9 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
200	IC-301	FERMENTER RAS MIXER 9 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
201	IC-301	FERMENTER RAS MIXER 9 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
202	IC-301	FERMENTER RAS MIXER 9 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
203	IC-301	FERMENTER RAS MIXER 9 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
204	IC-301	FERMENTER RAS MIXER 10 - IN REMOTE	BATTERY E RIO-01	COMM	-
205	IC-301	FERMENTER RAS MIXER 10 - RUNNING	BATTERY E RIO-01	COMM	-
206	IC-301	FERMENTER RAS MIXER 10 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
207	IC-301	FERMENTER RAS MIXER 10 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
208	IC-301	FERMENTER RAS MIXER 10 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
209	IC-301	FERMENTER RAS MIXER 10 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
210	IC-301	FERMENTER RAS MIXER 10 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
211	IC-301	FERMENTER RAS MIXER 11 - IN REMOTE	BATTERY E RIO-01	COMM	-
212	IC-301	FERMENTER RAS MIXER 11 - RUNNING	BATTERY E RIO-01	COMM	-
213	IC-301	FERMENTER RAS MIXER 11 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
214	IC-301	FERMENTER RAS MIXER 11 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
215	IC-301	FERMENTER RAS MIXER 11 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
216	IC-301	FERMENTER RAS MIXER 11 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
217	IC-301	FERMENTER RAS MIXER 11 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
218	IC-301	FERMENTER RAS MIXER 12 - IN REMOTE	BATTERY E RIO-01	COMM	-
219	IC-301	FERMENTER RAS MIXER 12 - RUNNING	BATTERY E RIO-01	COMM	-
220	IC-301	FERMENTER RAS MIXER 12 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
221	IC-301	FERMENTER RAS MIXER 12 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
222	IC-301	FERMENTER RAS MIXER 12 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
223	IC-301	FERMENTER RAS MIXER 12 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
224	IC-301	FERMENTER RAS MIXER 12 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
225	IC-301	FERMENTER RAS MIXER 13 - IN REMOTE	BATTERY E RIO-01	COMM	-
226	IC-301	FERMENTER RAS MIXER 13 - RUNNING	BATTERY E RIO-01	COMM	-
227	IC-301	FERMENTER RAS MIXER 13 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
228	IC-301	FERMENTER RAS MIXER 13 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
229	IC-301	FERMENTER RAS MIXER 13 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
230	IC-301	FERMENTER RAS MIXER 13 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
231	IC-301	FERMENTER RAS MIXER 13 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
232	IC-301	FERMENTER RAS MIXER 14 - IN REMOTE	BATTERY E RIO-01	COMM	-
233	IC-301	FERMENTER RAS MIXER 14 - RUNNING	BATTERY E RIO-01	COMM	-
234	IC-301	FERMENTER RAS MIXER 14 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
235	IC-301	FERMENTER RAS MIXER 14 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
236	IC-301	FERMENTER RAS MIXER 14 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
237	IC-301	FERMENTER RAS MIXER 14 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
238	IC-301	FERMENTER RAS MIXER 14 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
239	IC-301	ANOXIC PASS MIXER 1 - IN REMOTE	BATTERY E RIO-01	COMM	-
240	IC-301	ANOXIC PASS MIXER 1 - RUNNING	BATTERY E RIO-01	COMM	-
241	IC-301	ANOXIC PASS MIXER 1 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
242	IC-301	ANOXIC PASS MIXER 1 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
243	IC-301	ANOXIC PASS MIXER 1 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
244	IC-301	ANOXIC PASS MIXER 2 - IN REMOTE	BATTERY E RIO-01	COMM	-
245	IC-301	ANOXIC PASS MIXER 2 - RUNNING	BATTERY E RIO-01	COMM	-
246	IC-301	ANOXIC PASS MIXER 2 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
247	IC-301	ANOXIC PASS MIXER 2 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
248	IC-301	ANOXIC PASS MIXER 2 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
249	IC-301	ANOXIC PASS MIXER 3 - IN REMOTE	BATTERY E RIO-01	COMM	-
250	IC-301	ANOXIC PASS MIXER 3 - RUNNING	BATTERY E RIO-01	COMM	-
251	IC-301	ANOXIC PASS MIXER 3 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
252	IC-301	ANOXIC PASS MIXER 3 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
253	IC-301	ANOXIC PASS MIXER 3 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
254	IC-301	ANOXIC PASS MIXER 4 - IN REMOTE	BATTERY E RIO-01	COMM	-
255	IC-301	ANOXIC PASS MIXER 4 - RUNNING	BATTERY E RIO-01	COMM	-
256	IC-301	ANOXIC PASS MIXER 4 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
257	IC-301	ANOXIC PASS MIXER 4 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
258	IC-301	ANOXIC PASS MIXER 4 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
259	IC-301	ANOXIC PASS MIXER 5 - IN REMOTE	BATTERY E RIO-01	COMM	-
260	IC-301	ANOXIC PASS MIXER 5 - RUNNING	BATTERY E RIO-01	COMM	-
261	IC-301	ANOXIC PASS MIXER 5 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
262	IC-301	ANOXIC PASS MIXER 5 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
263	IC-301	ANOXIC PASS MIXER 5 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
264	IC-301	ANOXIC PASS MIXER 6 - IN REMOTE	BATTERY E RIO-01	COMM	-
265	IC-301	ANOXIC PASS MIXER 6 - RUNNING	BATTERY E RIO-01	COMM	-
266	IC-301	ANOXIC PASS MIXER 6 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-

SOFT I/O

267	IC-301	ANOXIC PASS MIXER 6 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
268	IC-301	ANOXIC PASS MIXER 6 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
269	IC-301	ANOXIC PASS MIXER 7 - IN REMOTE	BATTERY E RIO-01	COMM	-
270	IC-301	ANOXIC PASS MIXER 7 - RUNNING	BATTERY E RIO-01	COMM	-
271	IC-301	ANOXIC PASS MIXER 7 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
272	IC-301	ANOXIC PASS MIXER 7 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
273	IC-301	ANOXIC PASS MIXER 7 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
274	IC-301	ANOXIC PASS MIXER 8 - IN REMOTE	BATTERY E RIO-01	COMM	-
275	IC-301	ANOXIC PASS MIXER 8 - RUNNING	BATTERY E RIO-01	COMM	-
276	IC-301	ANOXIC PASS MIXER 8 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
277	IC-301	ANOXIC PASS MIXER 8 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
278	IC-301	ANOXIC PASS MIXER 8 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
281	IC-302	INFLUENT CHANNEL MIXER 1 - IN REMOTE	BATTERY E RIO-01	COMM	-
282	IC-302	INFLUENT CHANNEL MIXER 1 - RUNNING	BATTERY E RIO-01	COMM	-
283	IC-302	INFLUENT CHANNEL MIXER 1 - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
284	IC-302	INFLUENT CHANNEL MIXER 1 - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
285	IC-302	INFLUENT CHANNEL MIXER 1 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
313	IC-303	AERATION TANK 1 WEST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
314	IC-303	AERATION TANK 1 WEST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
315	IC-303	AERATION TANK 1 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
316	IC-303	AERATION TANK 1 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
317	IC-303	AERATION TANK 1 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
318	IC-303	AERATION TANK 1 EAST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
319	IC-303	AERATION TANK 1 EAST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
320	IC-303	AERATION TANK 1 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
321	IC-303	AERATION TANK 1 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
322	IC-303	AERATION TANK 1 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
389	IC-304	AERATION TANK 2 WEST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
390	IC-304	AERATION TANK 2 WEST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
391	IC-304	AERATION TANK 2 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
392	IC-304	AERATION TANK 2 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
393	IC-304	AERATION TANK 2 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
394	IC-304	AERATION TANK 2 EAST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
395	IC-304	AERATION TANK 2 EAST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
396	IC-304	AERATION TANK 2 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
397	IC-304	AERATION TANK 2 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
398	IC-304	AERATION TANK 2 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
466	IC-305	AERATION TANK 3 WEST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
467	IC-305	AERATION TANK 3 WEST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
468	IC-305	AERATION TANK 3 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
469	IC-305	AERATION TANK 3 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
470	IC-305	AERATION TANK 3 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
471	IC-305	AERATION TANK 3 EAST MIXER - IN REMOTE	BATTERY E RIO-01	COMM	-
472	IC-305	AERATION TANK 3 EAST MIXER - RUNNING	BATTERY E RIO-01	COMM	-
473	IC-305	AERATION TANK 3 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-01	COMM	-
474	IC-305	AERATION TANK 3 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-01	COMM	-
475	IC-305	AERATION TANK 3 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
770	IC-401	FERMENTER RAS PUMP 1 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
771	IC-401	FERMENTER RAS PUMP 1 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
772	IC-401	FERMENTER RAS PUMP 1 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
773	IC-401	FERMENTER RAS PUMP 1 - VOLTAGE	BATTERY E RIO-01	COMM	PER MANUFACTURER
774	IC-401	FERMENTER RAS PUMP 1 - CURRENT	BATTERY E RIO-01	COMM	PER MANUFACTURER
785	IC-401	FERMENTER RAS PUMP 2 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
786	IC-401	FERMENTER RAS PUMP 2 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
787	IC-401	FERMENTER RAS PUMP 2 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
788	IC-401	FERMENTER RAS PUMP 2 - VOLTAGE	BATTERY E RIO-01	COMM	PER MANUFACTURER
789	IC-401	FERMENTER RAS PUMP 2 - CURRENT	BATTERY E RIO-01	COMM	PER MANUFACTURER
800	IC-401	FERMENTER RAS PUMP 3 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
801	IC-401	FERMENTER RAS PUMP 3 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
802	IC-401	FERMENTER RAS PUMP 3 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
803	IC-401	FERMENTER RAS PUMP 3 - VOLTAGE	BATTERY E RIO-01	COMM	PER MANUFACTURER
804	IC-401	FERMENTER RAS PUMP 3 - CURRENT	BATTERY E RIO-01	COMM	PER MANUFACTURER
815	IC-402	WAS PUMP 1 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-
816	IC-402	WAS PUMP 1 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
817	IC-402	WAS PUMP 1 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
818	IC-402	WAS PUMP 1 - VOLTAGE	BATTERY E RIO-01	COMM	PER MANUFACTURER
819	IC-402	WAS PUMP 1 - CURRENT	BATTERY E RIO-01	COMM	PER MANUFACTURER
830	IC-402	WAS PUMP 2 - START/STOP COMMAND	BATTERY E RIO-01	COMM	-

SOFT I/O

831	IC-402	WAS PUMP 2 - SPEED COMMAND	BATTERY E RIO-01	COMM	0 - 100%
832	IC-402	WAS PUMP 2 - SPEED FEEDBACK	BATTERY E RIO-01	COMM	0 - 100%
833	IC-402	WAS PUMP 2 - VOLTAGE	BATTERY E RIO-01	COMM	PER MANUFACTURER
834	IC-402	WAS PUMP 2 - CURRENT	BATTERY E RIO-01	COMM	PER MANUFACTURER
286	IC-302	INFLUENT CHANNEL MIXER 2 - IN REMOTE	BATTERY E RIO-02	COMM	-
287	IC-302	INFLUENT CHANNEL MIXER 2 - RUNNING	BATTERY E RIO-02	COMM	-
288	IC-302	INFLUENT CHANNEL MIXER 2 - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
289	IC-302	INFLUENT CHANNEL MIXER 2 - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
290	IC-302	INFLUENT CHANNEL MIXER 2 - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
291	IC-302	INFLUENT CHANNEL MIXER 3 - IN REMOTE	BATTERY E RIO-02	COMM	-
292	IC-302	INFLUENT CHANNEL MIXER 3 - RUNNING	BATTERY E RIO-02	COMM	-
293	IC-302	INFLUENT CHANNEL MIXER 3 - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
294	IC-302	INFLUENT CHANNEL MIXER 3 - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
295	IC-302	INFLUENT CHANNEL MIXER 3 - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
296	IC-302	INFLUENT CHANNEL MIXER 4 - IN REMOTE	BATTERY E RIO-02	COMM	-
297	IC-302	INFLUENT CHANNEL MIXER 4 - RUNNING	BATTERY E RIO-02	COMM	-
298	IC-302	INFLUENT CHANNEL MIXER 4 - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
299	IC-302	INFLUENT CHANNEL MIXER 4 - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
300	IC-302	INFLUENT CHANNEL MIXER 4 - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
542	IC-306	AERATION TANK 4 WEST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
543	IC-306	AERATION TANK 4 WEST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
544	IC-306	AERATION TANK 4 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
545	IC-306	AERATION TANK 4 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
546	IC-306	AERATION TANK 4 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
547	IC-306	AERATION TANK 4 EAST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
548	IC-306	AERATION TANK 4 EAST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
549	IC-306	AERATION TANK 4 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
550	IC-306	AERATION TANK 4 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
551	IC-306	AERATION TANK 4 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
619	IC-307	AERATION TANK 5 WEST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
620	IC-307	AERATION TANK 5 WEST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
621	IC-307	AERATION TANK 5 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
622	IC-307	AERATION TANK 5 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
623	IC-307	AERATION TANK 5 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
624	IC-307	AERATION TANK 5 EAST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
625	IC-307	AERATION TANK 5 EAST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
626	IC-307	AERATION TANK 5 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
627	IC-307	AERATION TANK 5 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
628	IC-307	AERATION TANK 5 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
695	IC-308	AERATION TANK 6 WEST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
696	IC-308	AERATION TANK 6 WEST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
697	IC-308	AERATION TANK 6 WEST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
698	IC-308	AERATION TANK 6 WEST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
699	IC-308	AERATION TANK 6 WEST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
700	IC-308	AERATION TANK 6 EAST MIXER - IN REMOTE	BATTERY E RIO-02	COMM	-
701	IC-308	AERATION TANK 6 EAST MIXER - RUNNING	BATTERY E RIO-02	COMM	-
702	IC-308	AERATION TANK 6 EAST MIXER - SHUTDOWN FAULT ALARM	BATTERY E RIO-02	COMM	-
703	IC-308	AERATION TANK 6 EAST MIXER - WARNING FAULT ALARM	BATTERY E RIO-02	COMM	-
704	IC-308	AERATION TANK 6 EAST MIXER - START/STOP COMMAND	BATTERY E RIO-02	COMM	-
1	IC-002	PCB BUS 1 VOLTAGE PER PHASE FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
2	IC-002	PCB BUS 1 CURRENT PER PHASE FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
3	IC-002	PCB BUS 1 POWER FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
4	IC-002	PCB BUS 1 POWER FACTOR FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
5	IC-002	PCB BUS 2 VOLTAGE PER PHASE FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
6	IC-002	PCB BUS 2 CURRENT PER PHASE FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
7	IC-002	PCB BUS 2 POWER FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER
8	IC-002	PCB BUS 2 POWER FACTOR FROM POWER MONITOR	PCB	COMM	PER MANUFACTURER

Attachment 5

Equipment List

MWRDGC
Battery E Plant Expansion
JSH-240430-1 Rev 05 - Equipment List

QTY	PART NUMBER	DESCRIPTION
HMI SYSTEM SOFTWARE		
PROCESS AUTOMATION CONTROL		
3	2PAA122376R1	PM891 RED. SW LICENSE 800XA 6.1.1
OPERATIONS		
2	2PAA122296R1	OPERATOR WORKPLACE - ADD. CLIENT 6.1.1
CONTROLLER CABINET		
800XA PROCESSOR & I/O CABINETS		
1	OP-OTHER	TWO-DOOR NEMA 12 CABINET, GRAY, 72x72x18, STEEL
1	8128235	CABINET SIDEWALL PANEL KIT, NEMA 12/4
1	6638902A3	ABB CABINET LOGO ABS PLASTIC
2	OP-OTHER	LED CABINET LIGHT, SCE-LF24
3	OP-OTHER	CONVENIENCE OUTLET
3	OP-OTHER	CONVENIENCE BREAKER
1	3110000	THERMOSTAT - SK3110
PANEL HARDWARE		
1	OP-OTHER	60x68" MOUNTING PANEL
2	5050063	INSTALLATION MOUNTING PANEL KIT
AC800M MISC PROJECT HARDWARE		
1	3BSC630197R1	TK212A TOOL CABLE RJ45 8P8C PLUG
AC800M REDUNDANT PROCESSOR CONTROLLERS		
2	3BSE053242R1	PM891K02 REDUNDANT PROCESSOR UNIT
4	3BSE018172R1	SB822 RECHARGEABLE BATTERY UNIT
8	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)
2	3BSE031155R1	BC810K02 CEX-BUS INTERCONNECTION UNIT
AC800M POWER SUPPLIES		
4	3BSC610067R1	SD834 POWER SUPPLY, 20A
2	3BSE022262R1	MAINS BREAKER KIT FOR DIN RAIL 115/230V
S800 INTERFACE HARDWARE		
8	3BSE092689R1	CI867AK01 MODBUS TCP INTERFACE
8	2PAA122389R1	CI867 MODBUS TCP SW LICENSE 800XA 6.1.1
PROFINET		
4	3BSE092693R1	CI871AK01 PROFINET IO INTERFACE
4	2PAA122392R1	CI871 PROFINET IO SW LICENSE 800XA 6.1.1
ABB SWITCHES		
8	3BSE080207R1	NE810 NETWORK SWITCH
8	3BSE080208R1	NE820 NETWORK SWITCH
20	3BSE080214R1	PT801 OPTICAL TRANSCEIVER
20	OP-OTHER	3M LC-LC OM4 MM PVC FIBER OPTIC PATCH CABLE, 10GB/100GB
ADDITIONAL CABINET HARDWARE		
2	OP-OTHER	HF10 SIDE MOUNT FILTER FAN, 115V
2	OP-OTHER	HG FILTER FAN EXHAUST GRILL
1	OP-OTHER	1500VA/900W TOWER UPS, APC SMC1500C
BLOCK MARSHALLING		
1	OP-OTHER	1 LOT - MARSHALLING TB KIT FUSES
BATTERY E I/O CABINETS		
800XA PROCESSOR & I/O CABINETS		
1	OP-OTHER	TWO-DOOR NEMA 4X RIGHT BAY CABINET, 86Hx78Wx24D, SS
1	OP-OTHER	TWO-DOOR NEMA 4X LEFT BAY CABINET, 86Hx78Wx24D, SS
1	8128235	CABINET SIDEWALL PANEL KIT, NEMA 12/4
1	OP-OTHER	GASKET BOLT KIT

2	6638902A3	ABB CABINET LOGO ABS PLASTIC
1	8800430	TS BAYING QUICK BRACKET
1	8800500	TS BAYING QUICK WEDGE
2	OP-OTHER	LED CABINET LIGHT, SCE-LF24
3	OP-OTHER	CONVENIENCE OUTLET
3	OP-OTHER	CONVENIENCE BREAKER
1	3110000	THERMOSTAT - SK3110
PANEL HARDWARE		
2	OP-OTHER	78H X 70.75W MOUNTING PANEL
2	5050063	INSTALLATION MOUNTING PANEL KIT
CABINET TEMPERATURE MONITORING		
1	CJCAI835	OMEGA 100 OHM PLUG IN RTD
AC800M POWER SUPPLIES		
4	3BSC610067R1	SD834 POWER SUPPLY, 20A
2	3BSE022262R1	MAINS BREAKER KIT FOR DIN RAIL 115/230V
PROFINET		
10	3BSE075853R1	CI845 ETHERNET FCI MODULE
10	3BSE076220R1	TC810 ETHERNET ADAPTER FOR ETHERNET FCI
5	3BSE078710R1	TU860 MTU FOR ETHERNET FCI AND S800
20	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)
S800 ANALOG INPUTS		
13	3BSC690071R1	AI890 ANALOG INPUT IS 8 CH
13	3BSC840157R1	TU891 NON-IS MTU
1	OP-OTHER	TERMINAL BLOCK SCREW CONNECTION, VIOK 1 5-3D/PE BU VIOK SERIES, PKG OF 50
1	3BSE040662R1	AI830A ANALOG INPUT RTD 8 CH
1	3BSE013234R1	TU830V1 EXTENDED MTU, 50V
S800 ANALOG OUTPUTS		
4	3BSC690072R1	AO890 ANALOG OUTPUT IS 8 CH
4	3BSC840157R1	TU891 NON-IS MTU
S800 DIGITAL INPUTS		
25	3BSE069054R1	DI828 DIGITAL INPUT 120V 16 CH
25	3BSE068782R1	TU851 EXTENDED MTU, 250V
S800 DIGITAL OUPUTS - FIELD POWERED		
4	3BSE069053R1	DO818 DIGITAL OUTPUT 24V 32 CH
4	3BSE013232R1	TU812V1 COMPACT MTU, 50V, D-SUB
4	2304665	PHOENIX 3 METER Y-CABLE FOR RELAY BOARDS, DB-25
8	5604258	PHOENIX P/N 5604258 RELAY BOARD WITH 8 RELAYS
ABB SWITCHES		
2	3BSE080207R1	NE810 NETWORK SWITCH
2	3BSE080208R1	NE820 NETWORK SWITCH
4	3BSE080214R1	PT801 OPTICAL TRANSCEIVER
4	OP-OTHER	3M LC-LC OM4 MM PVC FIBER OPTIC PATCH CABLE, 10GB/100GB
4	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)
ADDITIONAL CABINET HARDWARE		
1	OP-OTHER	1500VA/900W TOWER UPS, APC SMC1500C
I/O FUSING		
265	OP-OTHER	FUSES FOR S800
MARSHALLING		
600	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
400	3046100	PHOEX FUSED TB WITH LED 250VAC
400	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
50	3047170	END COVER - D-UT 2,5/4-QUATTRO
100	800886	END STOP - E/NS 35-N
100	3030213	BUS STRIP - FBS 10-5
BLOCK MARSHALLING		
4	MTBD-DO810R1	DO810R1 MARSHALLING TB KIT DISCONNECT

BATTERY E RIO-02**800XA PROCESSOR & I/O CABINETS**

1	OP-OTHER	TWO-DOOR NEMA 4X RIGHT BAY CABINET, 86Hx78Wx24D, SS
1	OP-OTHER	TWO-DOOR NEMA 4X LEFT BAY CABINET, 86Hx78Wx24D, SS
1	8128235	CABINET SIDEWALL PANEL KIT, NEMA 12/4
1	OP-OTHER	GASKET BOLT KIT
2	6638902A3	ABB CABINET LOGO ABS PLASTIC
1	8800430	TS BAYING QUICK BRACKET
1	8800500	TS BAYING QUICK WEDGE
2	OP-OTHER	LED CABINET LIGHT, SCE-LF24
3	OP-OTHER	CONVENIENCE OUTLET
3	OP-OTHER	CONVENIENCE BREAKER
1	3110000	THERMOSTAT - SK3110

PANEL HARDWARE

2	OP-OTHER	78H X 70.75W MOUNTING PANEL
2	5050063	INSTALLATION MOUNTING PANEL KIT

CABINET TEMPERATURE MONITORING

1	CJCAI835	OMEGA 100 OHM PLUG IN RTD
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AC800M POWER SUPPLIES

4	3BSC610067R1	SD834 POWER SUPPLY, 20A
2	3BSE022262R1	MAINS BREAKER KIT FOR DIN RAIL 115/230V

PROFINET

8	3BSE075853R1	CI845 ETHERNET FCI MODULE
8	3BSE076220R1	TC810 ETHERNET ADAPTER FOR ETHERNET FCI
4	3BSE078710R1	TU860 MTU FOR ETHERNET FCI AND S800
16	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)

S800 ANALOG INPUTS

17	3BSC690071R1	AI890 ANALOG INPUT IS 8 CH
17	3BSC840157R1	TU891 NON-IS MTU
1	OP-OTHER	TERMINAL BLOCK SCREW CONNECTION, VIOK 1 5-3D/PE BU VIOK SERIES, PKG OF 50
1	3BSE040662R1	AI830A ANALOG INPUT RTD 8 CH
1	3BSE013234R1	TU830V1 EXTENDED MTU, 50V

S800 ANALOG OUTPUTS

6	3BSC690072R1	AO890 ANALOG OUTPUT IS 8 CH
6	3BSC840157R1	TU891 NON-IS MTU

S800 DIGITAL INPUTS

19	3BSE069054R1	DI828 DIGITAL INPUT 120V 16 CH
19	3BSE068782R1	TU851 EXTENDED MTU, 250V

S800 DIGITAL OUPUTS - FIELD POWERED

2	3BSE008510R1	DO810 DIGITAL OUTPUT 24V 16 CH
2	3BSE013232R1	TU812V1 COMPACT MTU, 50V, D-SUB
2	2304665	PHOENIX 3 METER Y-CABLE FOR RELAY BOARDS, DB-25
4	5604258	PHOENIX P/N 5604258 RELAY BOARD WITH 8 RELAYS

ABB SWITCHES

2	3BSE080207R1	NE810 NETWORK SWITCH
2	3BSE080208R1	NE820 NETWORK SWITCH
4	3BSE080214R1	PT801 OPTICAL TRANSCEIVER
4	OP-OTHER	3M LC-LC OM4 MM PVC FIBER OPTIC PATCH CABLE, 10GB/100GB

ADDITIONAL CABINET HARDWARE

1	OP-OTHER	1500VA/900W TOWER UPS, APC SMC1500C
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I/O FUSING

217	OP-OTHER	FUSES FOR S800
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MARSHALLING

456	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
304	3046100	PHOEX FUSED TB WITH LED 250VAC
304	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P

38	3047170	END COVER - D-UT 2,5/4-QUATTRO
76	800886	END STOP - E/NS 35-N
76	3030213	BUS STRIP - FBS 10-5

BLOCK MARSHALLING

2	MTBD-DO810R1	DO810R1 MARSHALLING TB KIT DISCONNECT
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NEW I/O CABINET IN PCB

CABINET TEMPERATURE MONITORING

1	CJCAI835	OMEGA 100 OHM PLUG IN RTD
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AC800M POWER SUPPLIES

2	3BSC610067R1	SD834 POWER SUPPLY, 20A
1	3BSC610068R1	SS832 POWER VOTING UNIT
1	3BSE022262R1	MAINS BREAKER KIT FOR DIN RAIL 115/230V

PROFINET

2	3BSE075853R1	CI845 ETHERNET FCI MODULE
2	3BSE076220R1	TC810 ETHERNET ADAPTER FOR ETHERNET FCI
1	3BSE078710R1	TU860 MTU FOR ETHERNET FCI AND S800
4	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)

S800 ANALOG INPUTS

1	3BSE040662R1	AI830A ANALOG INPUT RTD 8 CH
1	3BSE013234R1	TU830V1 EXTENDED MTU, 50V

S800 DIGITAL INPUTS

2	3BSE069054R1	DI828 DIGITAL INPUT 120V 16 CH
2	3BSE068782R1	TU851 EXTENDED MTU, 250V

I/O FUSING

20	OP-OTHER	FUSES FOR S800
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MARSHALLING

48	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
32	3046100	PHOEX FUSED TB WITH LED 250VAC
32	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
4	3047170	END COVER - D-UT 2,5/4-QUATTRO
8	800886	END STOP - E/NS 35-N
8	3030213	BUS STRIP - FBS 10-5

WALL MOUNT CABINET

1	OP-OTHER	S.S. LPPL ENCLOSURE, 48H X 36W X 12D
1	OP-OTHER	LED CABINET LIGHT, SCE-LF24

NEW I/O CABINET IN METERING BLDG

POWER SUPPLIES

1	PWRKITACAC	INCOMING POWER KIT AC/AC
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CABINET TEMPERATURE MONITORING

1	CJCAI835	OMEGA 100 OHM PLUG IN RTD
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AC800M POWER SUPPLIES

2	3BSC610067R1	SD834 POWER SUPPLY, 20A
1	3BSC610068R1	SS832 POWER VOTING UNIT
1	3BSE022262R1	MAINS BREAKER KIT FOR DIN RAIL 115/230V

PROFINET

2	3BSE075853R1	CI845 ETHERNET FCI MODULE
2	3BSE076220R1	TC810 ETHERNET ADAPTER FOR ETHERNET FCI
1	3BSE078710R1	TU860 MTU FOR ETHERNET FCI AND S800
4	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)

S800 ANALOG INPUTS

1	3BSC690071R1	AI890 ANALOG INPUT IS 8 CH
1	3BSC840157R1	TU891 NON-IS MTU
1	3BSE040662R1	AI830A ANALOG INPUT RTD 8 CH
1	3BSE013234R1	TU830V1 EXTENDED MTU, 50V

S800 ANALOG OUTPUTS

1	3BSC690072R1	AO890 ANALOG OUTPUT IS 8 CH
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1	3BSC840157R1	TU891 NON-IS MTU
S800 DIGITAL INPUTS		
1	3BSE069054R1	DI828 DIGITAL INPUT 120V 16 CH
1	3BSE068782R1	TU851 EXTENDED MTU, 250V
I/O FUSING		
14	OP-OTHER	FUSES FOR S800
MARSHALLING		
24	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
16	3046100	PHOEX FUSED TB WITH LED 250VAC
16	3046171	PHOENIX FEEDTHROUGH TB WITH QD - UT4-MT-P/P
2	3047170	END COVER - D-UT 2,5/4-QUATTRO
4	800886	END STOP - E/NS 35-N
4	3030213	BUS STRIP - FBS 10-5
ABB SWITCHES		
2	3BSE080207R1	NE810 NETWORK SWITCH
2	3BSE080214R1	PT801 OPTICAL TRANSCEIVER
FIELD NETWORKING CABINET		
WALL MOUNT CABINET		
2	OP-OTHER	S.S. LPPL ENCLOSURE, 48H X 36W X 12D
1	OP-OTHER	LED CABINET LIGHT, SCE-LF24
4	3BSC610067R1	SD834 POWER SUPPLY, 20A
2	OP-OTHER	FO CONNECTOR HOUSING, CORNING WCH-04P
8	OP-OTHER	FIBER PANEL, CORNING CCH-CP12-AD
4	OP-OTHER	AC BREAKER
20	OP-OTHER	UKK-HESI FUSE HOLDER
SERVER CABINET		
ABB SWITCHES		
8	3BSE080207R1	NE810 NETWORK SWITCH
8	3BSE080214R1	PT801 OPTICAL TRANSCEIVER
8	OP-OTHER	3M LC-LC OM4 MM PVC FIBER OPTIC PATCH CABLE, 10GB/100GB
CLIENT/SERVER EQUIPMENT		
OPERATOR WORKSTATIONS		
2	OP-OTHER	ADVANTECH CLIENT COMPUTER
2	OP-OTHER	PEDESTAL WORKSTATION, 304SS, WITH 24" MONITOR, INDUSTRIAL KEYBOARD & PC HOUSING
2	MUT-00074	WIN 10 IOT ENT 2021 LTSC MULTILANG ESD OEI HIGH END
2	ENSOEM-AA-BA	MFE ENDPOINT SECURITY FOR OEM PERP
VDFs		
SWITCHES REQUIRED FOR DRIVES		
43	3BSE080207R1	NE810 NETWORK SWITCH
43	EVNSL64X-0010	CAT 6 CABLE EVNSL64X 0010 (10FT)
SPARE PARTS		
AC800M REDUNDANT PROCESSOR CONTROLLERS		
1	3BSE053242R1	PM891K02 REDUNDANT PROCESSOR UNIT
AC800M POWER SUPPLIES		
1	3BSC610067R1	SD834 POWER SUPPLY, 20A
S800 INTERFACE HARDWARE		
1	3BSE092689R1	CI867AK01 MODBUS TCP INTERFACE
PROFINET		
1	3BSE092693R1	CI871AK01 PROFINET IO INTERFACE
2	3BSE075853R1	CI845 ETHERNET FCI MODULE
2	3BSE076220R1	TC810 ETHERNET ADAPTER FOR ETHERNET FCI
S800 ANALOG INPUTS		
3	3BSC690071R1	AI890 ANALOG INPUT IS 8 CH
1	3BSE040662R1	AI830A ANALOG INPUT RTD 8 CH
S800 ANALOG OUTPUTS		
1	3BSC690072R1	AO890 ANALOG OUTPUT IS 8 CH

S800 DIGITAL INPUTS

5 3BSE069054R1 DI828 DIGITAL INPUT 120V 16 CH

S800 DIGITAL OUPUTS - FIELD POWERED

1 3BSE008510R1 DO810 DIGITAL OUTPUT 24V 16 CH

2 5604258 PHOENIX P/N 5604258 RELAY BOARD WITH 8 RELAYS

BLOCK MARSHALLING

1 OP-OTHER 1 LOT - MARSHALLING TB KIT FUSES

Attachment 6

System Overview Drawing

MWRDGC O'Brien - Battery E Plant Expansion System Overview Drawing

PCB Telecom Room

Controller & Interface Cabinet Digital I/O Cabinet



Multimode –
S800 Profinet
800xA Client Network
VFD Drive Interfaces
Flygt MAS Interface
Other Intelligent devices

HARDWIRED I/O
DI = 8

AC800M
Control
Network

To/From
Server
Cabinets

Battery E

RIO-01

RIO-02



S800 Profinet

Client/Server Network

Interface Network

Flygt MAS
VFD Drives
Other Intelligent Devices

OWS



SOFT I/O
TOTAL 259

OWS



Metering Building

New I/O in
Existing
Cabinet



HARDWIRED I/O
AI = 2
RTD = 0
AO = 1
DI = 4
DO (FIELD) = 0

TOTAL = 7

RIO-01 HARDWIRED I/O

AI = 81
RTD = 1
AO = 23
DI = 309
DO (FIELD) = 42

TOTAL 456

RIO-02 HARDWIRED I/O

AI = 111
RTD = 1
AO = 37
DI = 240
DO (FIELD) = 24

TOTAL 413

Notes:

1. Proposal is based on ABB providing new cabinets, as shown, except for in Metering Building.
2. All cabling outside the cabinets are to be provided and installed by others.
3. Unless otherwise stated within proposal, Ethernet connectivity is limited to ABB supplied equipment within cabinets.
4. Any required converters for Fiber Optic to Ethernet cables are to be provided by the customer.
5. Actual layout of equipment will vary. Drawing shows quantity of equipment and system connections.
6. Pedestals are included for OWS, but not shown on drawing.

Key

CAT6 Ethernet – Client/Server Network
CAT6 Ethernet – Profinet I/O Network
CAT6 Ethernet – AC800M Control Network
Multimode Fiber
Third-Party Interface



SYSTEM OVERVIEW DRAWING

CUSTOMER: MWRDGC O'Brien
PROJECT: Battery E Plant Expansion



ABB INC.
PROCESS AUTOMATION
ENERGY INDUSTRIES NORTH AMERICA

ABB PROPOSAL
JSH-240430-1 Rev 05

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