DATE: 10/11/2017

BID NO.: 50-00121175

INVITATION TO BID
THIS IS NOT AN ORDER

JEFFERSON PARISH

PURCHASING DEPARTMENT
P.O. BOX 9
GRETNA, LA. 70054-0009
504-364-2678

BUYER: DREAMEY@jeffparish.net

BIDS WILL BE RECEIVED IN THE WEST BANK PURCHASING DEPT, SUITE 4400, JEFFERSON PARISH GENERAL GOVERNMENT BUILDING, 200 DERBIGNY STREET, GRETNA, LA 70053 UNTIL 2:00 PM, 10/26/2017 AND PUBLICLY OPENED THEREAFTER.
For convenience, bidders may also submit bids in the East Bank Purchasing Department, Suite 404, Jefferson Parish Joseph S. Yenni Building, 1221 Elmwood Park Blvd., Jefferson LA 70123. However, if submitting bids on the day of bid opening, bidders must submit at the West Bank location only. All bids will be publicly opened at the West Bank location.

At no charge, bidders may also submit via Jefferson Parish's electronic procurement page by visiting www.jeffparishbids.net to register for this free site. Additional instructions are included in the text box highlighting electronic procurement.

LATE BIDS WILL NOT BE ACCEPTED

Unless submitting via online (see Page 3), each bid must be submitted in a sealed envelope bearing on the outside: the name of the Bidder, his address, and the name of the project for which the bid is submitted and the bid number.

NOTE: ONLY BIDS WRITTEN IN INK OR TYPEWRITTEN, AND PROPERLY SIGNED BY A MEMBER OF THE FIRM OR AUTHORIZED REPRESENTATIVE, WILL BE ACCEPTED. PENCIL AND/OR PHOTOSTATIC FIGURES OR SIGNATURES SHALL RESULT IN BID REJECTION.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

THE FOLLOWING INSTRUCTIONS APPLY TO ALL BIDS

All bids submitted are subject to these instructions and general conditions and any special conditions and specifications contained herein, all of which are made part of this bid proposal reference. By submitting a bid, vendor agrees to comply with all provisions of Louisiana Law as well be in compliance with the Jefferson Parish Code of Ordinances, Louisiana Code of Ethics, applicable Jefferson Parish ethical standards and Jefferson Parish Resolution No. 113646 and/or Resolution No. 113647.

All vendors submitting bids should register as a Jefferson Parish vendor if not already yet registered. Registration forms may be downloaded from http://purchasing.jeffparish.net and by clicking on Vendor Information. Current W-9 forms with respective Tax Identification numbers and vendor applications may be submitted at any time; however, if your company is not registered and/or a current W-9 form is not on file, vendor registration is mandatory. Further, a current W-9 form and respective Tax Identification number must be supplied upon contract execution, should you be awarded a contract and/or issued purchase order. Failure to do so may result in delay of payment.

All quotations shall be based on F.O.B. Agency warehouse or job site, anywhere within the Parish as designated by the Purchasing Department. This provision does not apply to public works projects

JEFFERSON PARISH requires all products to be new (current) and all work must be performed according to standard practices for the project. Unless otherwise specified, no aftermarket parts will be accepted. Unless otherwise specified, all workmanship and materials must have at least one (1) year guaranty, in writing, from the date of delivery and/or acceptance of the project. Any deviations or alterations from the specifications must be indicated and/or supporting documentation supplied with bid submission.

Bidders should submit all questions in writing via email to the buyer's email address as indicated above, no later than Five (5) working days prior to the bid opening. Bid numbers should be mentioned in all requests. If submitting online, vendors may send questions via the E-Procurement site no later than Five (5) working days prior to the bid opening.

If this bid requires a pre-bid conference (see Additional Requirements section), bidders are advised that such conference will be held to allow bidders the opportunity to identify any discrepancies in the bid specifications and seek further clarification regarding instructions. The Purchasing Department will issue a written response to bidders' questions in the form of an Addendum. Please note that all official communication will be expressed in the form of an addendum.

All formal Addenda require written acknowledgement on the bid form by the bidder. Failure to acknowledge an Addendum on the bid form shall cause the bid to be rejected. JEFFERSON PARISH reserves the right to award bid to next lowest responsive and responsible bidder in this event.

The purpose and intention of this invitation to bid is to afford all suppliers an equal opportunity to bid on all construction, maintenance, repair, operating supplies and/or equipment listed in this bid proposal. JEFFERSON PARISH WILL ACCEPT ONE BID ONLY FROM EACH VENDOR. Items bid must meet specifications.

JEFFERSON PARISH will accept one price for each item unless otherwise indicated. Two or more prices for one item will result in bid rejection. Bidders are required to complete, sign and return the bid form and/or complete and return the associated line item pricing forms as indicated. Vendors must not alter the bid forms. Doing so will cause the bid to be rejected.

A corporate resolution or written evidence of the individual signing the bid having such authority must be submitted with the bid. Failure to comply will cause bid to be rejected. For corporate entities, such written evidence may be a printout of the Louisiana Secretary of State's website listing the signatory as an officer. Such printout shall be included with the bid submission. Bids submitted by Owners or Sole Proprietorships must include certification that he or she owns the entity for which the bid is signed. This documentation must be submitted with the bid. Failure to do so will result in bid rejection.

NOTE: A sample corporate resolution can be downloaded from our website http://purchasing.jeffparish.net or you may provide your own document. A sample certification of sole proprietorship can also be downloaded from our website http://purchasing.jeffparish.net or you may provide your own document.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

A. AWARD OF CONTRACT: JEFFERSON PARISH reserves the right to award contracts or place orders on a lump sum or individual item basis, or such combination, as shall in its judgment be in the best interest of JEFFERSON PARISH. Every contract or order shall be awarded to the LOWEST RESPONSIVE and RESPONSIBLE BIDDER, taking into consideration the CONFORMITY WITH THE SPECIFICATIONS and the DELIVERY AND/OR COMPLETION DATE. SPLIT AWARDS MADE TO SEVERAL VENDORS WILL ONLY BE GRANTED TO THOSE DEEMED RESPONSIVE AND RESPONSIBLE.

All bid prices shall remain valid for 45 days. Jefferson Parish and the lowest responsive and responsible bidder(s) by mutual written consent may mutually agree to extend the deadline for award by one (1) or more extensions of thirty (30) calendar days.

PROTESTS: Only those vendors that submitted a bid in response to this solicitation may submit a protest in writing to the Director of the Purchasing within 48 hours of bid opening. The Purchasing Director will review it in connection with the Parish Attorney's Office which will then respond in writing as soon as possible.

PREFERENCE: Unless federal funding is directly spent by Jefferson Parish for this purchase, preference is hereby given to materials, supplies, and provisions produced, manufactured or grown in Louisiana, quality being equal to articles offered by competitors outside the state. "LSA – R.S. 38:2251-2261"

B. USE OF BRAND NAMES AND STOCK NUMBERS: Where brand names and stock numbers are specified, it is for the purpose of establishing certain minimum standards of quality. Bids may be submitted for products of equal quality, provided brand names and stock numbers are specified. Complete product data may be required prior to award.

C. CANCELLATION OF CONTRACT: JEFFERSON PARISH reserves the right to cancel all or any part if not shipped promptly. No charges will be allowed for packing or cartage unless specified in quotation. The order must not be filled at a higher price than quoted. JEFFERSON PARISH reserves the right to cancel any contract at anytime and for any reason by issuing a THIRTY (30) day written notice to the contractor.

For good cause and as consideration for executing a contract with Jefferson Parish, vendor conveys, sells, assigns and transfers to Jefferson Parish or its assigns all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of Louisiana, relating to the particular good or services purchased or acquired by Jefferson Parish.

D. PRICES: Jefferson Parish is exempt from paying sales tax under LSA-R.S. 47:301 (8)(c). All prices for purchases by Jefferson Parish of supplies and materials shall be quoted in the unit of measure specified and unless otherwise specified, shall be exclusive of state and Parish taxes. The price quoted for work shall be stated in figures. In the event there is a difference in unit prices and totals, the unit price shall prevail.

Quantities listed are for bidding purposes only. Actual requirements may be more or less than quantities listed.

Bidders are not to exclude from participation in, deny the benefits of, or subject to discrimination under any program or activity, any person in the United States on the grounds of race, color, national origin, or sex; nor discriminate on the basis of age under the Age Discrimination Act of 1975; or with respect to an otherwise qualified handicapped individual as provided in Section 504 of the Rehabilitation Act of 1973, or on the basis of religion, except that any exemption from such prohibition against discrimination on the basis of religion as provided in the Civil Rights Act of 1964, or Title VI and VII of the Act of April 11, 1968, shall also apply. This assurance includes compliance with the administrative requirements of the Revenue Sharing final handicapped discrimination provisions contained in Section 51.55 (c), (d), (e), and (k)(5) of the Regulations. New construction or renovation projects must comply with Section 504 of the 1973 Rehabilitation Act, as amended, in accordance with the American National Standard Institute's specifications (ANSI A117.1-1961).

Jefferson Parish and its partners as the recipients of federal funds are fully committed to awarding a contract(s) to firm(s) that will provide high quality services and that are dedicated to diversity and to containing costs. Thus, Jefferson Parish strongly encourages the involvement of minority and/or woman-owned business enterprises (DBE's, including MBE's, WBE's and SBE's) to stimulate participation in procurement and assistance programs.

Advertised bids will be tabulated and a copy of the tabulation will be forwarded to each responding bidder

IN ACCORDANCE WITH STATE REGULATIONS JEFFERSON PARISH OFFERS ELECTRONIC PROCUREMENT TO ALL VENDORS

This electronic procurement system allows vendors the convenience of reviewing and submitting bids online. This is a secure site and authorized personnel have limited read access only. Bidders are encouraged to submit electronically using this free service; while the website accepts various file types, one single PDF file containing all appropriate and required bid documents is preferred. Bidders submitting uploaded images of bid responses are solely responsible for clarity. If uploaded images/documents are not legible, then bidder's submission will be rejected. Please note all requirements contained in this bid package for electronic bid submission.

Please visit our E-Procurement Page at www.jeffparishbids.net to register and view Jefferson Parish solicitations. For more information, please visit the Purchasing Department page at http://purchasing.jeffparish.net.

The general specifications for construction projects and the purchase of materials, services and/or supplies are those adopted by the JEFFERSON PARISH Council by Resolution No. 113646 or 113647 dated 12/09/09. The general conditions adopted by this resolution shall be considered as much a part of this document as if they were written wholly herein. A copy may be obtained from the Office of the Parish Clerk, Suite 6700, Jefferson Parish General Government Building, 200 Derbigny Street, Gretna, LA 70053. You may also obtain a copy by visiting the Purchasing Department webpage at http://purchasing.jeffparish.net and clicking on Online Forms

ADDITIONAL REQUIREMENTS FOR THIS BID

PLEASE MATCH THE NUMBERS PRINTED IN THIS BOX WITH THE CORRESPONDING INSTRUCTIONS BELOW.

13,15

1. All bidders must attend the MANDATORY pre-bid conference and will be required to sign in and out as evidence of attendance. In accordance with LSA R.S. 38:2212(J), all prospective bidders shall be present at the beginning of the MANDATORY pre-bid conference and shall remain in attendance for the duration of the conference. Any prospective bidder who fails to attend the conference or remain for the duration shall be prohibited from submitting a bid for the project.

2. Attendance to this pre-bid conference is optional. However, failure to attend the pre-bid conference shall not relieve the bidder of responsibility for information discussed at the conference. Furthermore, failure to attend the pre-bid conference and inspection does not relieve the successful bidder from the necessity of furnishing materials or performing any work that may be required to complete the work in accordance with the specification with no additional cost to the owner.

3. Contractor must hold current applicable JEFFERSON PARISH licenses with the Department of Inspection and Code Enforcement. Contractor shall obtain any and all permits required by the JEFFERSON PARISH Department of Inspection and Code Enforcement. The contractor shall be responsible for the payment of these permits. All permits must be obtained prior to the start of the project. Contractor must also hold any and all applicable Federal and State licenses. Contractor shall be responsible for the payment of these permits and shall obtain them prior to the start of the project.

4. A LA State Contractor's License will be required in accordance with LSA R.S. 37:2150 et. seq. and such license number will be shown on the outside of the bid envelope. Failure to comply will cause the bid to be rejected. Additionally if submitting the bid electronically, then the license number must be entered in the appropriate field in the Electronic Procurement system. Failure to comply will cause the bid to be rejected.

5. It is the bidder's responsibility to visit the job site and evaluate the job before submitting a bid.

6. Job site must be clean and free of all litter and debris daily and upon completion of the contract. Passageways must be kept clean and free of material, equipment, and debris at all times. Flammable material must be removed from the job site daily because storage will not be permitted on the premises. Precautions must be exercised at all times to safeguard the welfare of JEFFERSON PARISH and the general public.

INSTRUCTIONS FOR BIDDERS AND GENERAL CONDITIONS

7. PUBLIC WORKS BIDS: All awards for public works in excess of $5,000.00 will be reduced to a formal contract which shall be recorded at the contractor's expense with the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. A price list of recordation costs may be obtained from the Clerk of Court and Ex-Officio Recorder of Mortgages for the Parish of Jefferson. All awards in excess of $25,000.00 will require both a performance and a payment bond. Unless otherwise stated in the bid specifications, the performance bond requirements shall be 100% of the contract price. Unless otherwise state in the bid specifications, the payment bond requirements shall be 100% of the contract price. Both bonds shall be supplied at the signing of the contract.

8. NON-PUBLIC WORKS BIDS: A performance bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The performance bond shall be supplied at the signing of the contract.

9. NON-PUBLIC WORKS BIDS: A payment bond will be required for this bid. The amount of the bond will be 100% of the contract price unless otherwise indicated in the specifications. The payment bond shall be supplied at the signing of the contract.

10. Unless otherwise stated in the bid specifications, the successful bidder will be required to procure standard insurance policies evidencing Parish-mandated insurance requirements as indicated on the attached "insurance requirements" sheet. All bidders must comply with the instructions in this sheet. Failure to comply will cause bid to be rejected.

11. A bid bond will be required with bid submission in the amount of 5% of the total bid, unless otherwise stated in the bid specifications. Acceptable forms shall be limited to cashier's check, certified check, or surety bid bond. All sureties must be in original format (no copies). If submitting a bid online, vendors must submit an electronic bid bond through the respective online clearinghouse bond management system(s) as indicated in the electronic bid solicitation on Central Auction House. No scanned paper copies of any bid bond will be accepted as part of the electronic bid submission.

12. This is a requirements contract to be provided on an as needed basis. JEFFERSON PARISH makes no representations or warranties with regard to minimum guaranteed quantities unless otherwise stated in the bid specifications.

13. Freight charges should be included in total cost when quoting. If not quoted FOB DELIVERED, freight must be quoted as a separate item. Bid may be rejected if not quoted FOB DELIVERED or if freight charges are not indicated on bid form.

14. PUBLIC WORKS BIDS - Completed, Signed and Properly Notarized Affidavits Required: This applies to all solicitations for construction, alteration or demolition of public buildings or projects, in conformity with the provisions contained in LSA-RS 38:2212.9, LSA-RS 38:2212.10, LSA-RS 38:2224, and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Conviction Affidavit, Non-Collusion Affidavit, Campaign Contribution Affidavit, Debt Disclosures Affidavit and E-Verify Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.

15. NON PUBLIC WORK BIDS - Completed, Signed and Properly Notarized Affidavits Required in conformity with the provisions contained in LSA – RS 38:2224 and Sec 2-923.1 of the Jefferson Parish Code of Ordinances. For bidding purposes, all bidders must submit with bid submission COMPLETED, SIGNED and PROPERLY NOTARIZED Affidavits, including: Non-Collusion Affidavit, Debt Disclosures Affidavit and Campaign Contribution Affidavit. For the convenience of vendors, all affidavits have been combined into one form entitled NON PUBLIC WORKS BID AFFIDAVIT. This affidavit must be submitted in its original format, and without material alteration, in order to be compliant and for the bid to be considered responsive. A scanned copy of the completed, signed and properly notarized affidavit may be submitted with the bid, however, the successful bidder must submit the original affidavit in its original format and without material alteration upon contract execution. Failure to comply will result in the bid submission being rejected as non-responsive. The Parish reserves the right to award bid to the next lowest responsive and responsible bidder in this event.

16. The ensuing contract for this bid solicitation may be eligible for FEMA reimbursement and/or Federal funding/reimbursement. As such, the referenced appendix will be applicable accordingly and shall be considered a part of the bid documents. All applicable certifications must be duly completed, signed and submitted with bid submission. Failure to submit applicable certifications with bid submission will result in bid rejection.

17. For this project, the Contractor shall not pay any state or local sales or use taxes on materials and equipment which are affixed and made part of the immovable property of the project or which permanently incorporated in the project (hereinafter referred to as "applicable materials and equipment"). All purchases of applicable materials or equipment shall be made by the contractor on behalf of and as the agent of Jefferson Parish (Owner), a political subdivision of the State of Louisiana. No state and local sales and use taxes are owned on applicable materials and equipment under the provisions of Act 1029 of the 1991 Regular Session – Louisiana Revised Statute 47:301(B)(c). Owner will furnish contractor a certificate form which certifies that Owner is not required to pay such state or local sales and use taxes, and contractor shall furnish a copy of such certificate to all vendors or suppliers of the applicable materials and equipment.

It shall be the duty of every parish officer, employee, department, agency, special district, board, and commission; and the duty of every contractor, subcontractor, and licensee of the parish, and the duty of every applicant for certification of eligibility for a parish contract or program, to cooperate with the Inspector General in any investigation, audit, inspection, performance review, or hearing pursuant to Jefferson Parish Code of Ordinances Section 2-155.10(19). By submitting a bid, vendor acknowledges this and will abide by all provisions of the referenced Jefferson Parish Code of Ordinances.

BID FORM

Non Public Works

All Public Work Projects are required to use the Louisiana Uniform Public Work Bid Form

All prices must be held firm unless an escalation provision is requested in this bid. Jefferson Parish will allow one escalation during the term of the contract, which may not exceed the U.S. Bureau of Labor Statistics National Index for all Urban Consumers, unadjusted 12 month figure. The most recently published figure issued at the time an adjustment is requested will be used. A request must be made in writing by the vendor, and the escalation will only be applied to purchases made after the request is made.

Are you requesting an escalation provision?

YES _____ NO ✓

MAXIMUM ESCALATION PERCENTAGE REQUESTED _____%

INITIAL BID PRICES WILL REMAIN FIRM THROUGH THE DATE OF 12/30/17

For the purposes of comparison of bids when an escalation provision is requested, Jefferson Parish will apply the maximum escalation percentage quoted by the bidder to the period to which it is applied in the bid. The initial price and the escalation will be used to calculate the total bid price. It will be assumed,for comparison of prices only, that an equal amount of material or labor is purchased each month throughout the entire contract.

DELIVERY: FOB JEFFERSON PARISH

INDICATE DELIVERY DATE ON EQUIPMENT AND SUPPLIES 14-16 weeks after receipt of approved submittals

LOUISIANA CONTRACTOR'S LICENSE NO.: (if applicable) N/A

THIS SECTION MUST BE COMPLETED BY BIDDER:

FIRM NAME: Gulf States Engineering Co, Inc

ADDRESS: 17961 Painters Row

CITY, STATE: Covington, LA ZIP: 70435

TELEPHONE: (985) 327-6049 FAX: (985) 893-5484

EMAIL ADDRESS: diana@gsengr.com

In the event that addenda are issued with this bid, bidders MUST acknowledge all addenda on the bid form.Bidder must acknowledge receipt of an addendum on the bid form as indicated. Failure to acknowledge any addendum on the bid form will result in bid rejection.

Acknowledge Receipt of Addenda: NUMBER: #1

NUMBER: _____

NUMBER: _____

NUMBER: _____

TOTAL PRICE OF ALL BID ITEMS: $ 53,469.00

AUTHORIZED SIGNATURE: Joanne James Joanne James

Printed Name

TITLE: Secretary/Treasurer

SIGNING INDICATES YOU HAVE READ AND COMPLY WITH THE INSTRUCTIONS AND CONDITIONS.

NOTE: All bids should be returned with the BID NUMBER and BID OPENING DATE indicated on the outside of the envelope submitted to the Purchasing Department.

DATE: 10/11/2017

INVITATION TO BID FROM JEFFERSON PARISH - continued

BID NO.: 50-00121175

SEALED BID

ITEM NUMBER	QUANTITY	UM	DESCRIPTION OF ARTICLES	UNIT PRICE QUOTED	TOTALS
			ONE TIME PURCHASE OF A DUPLEX PUMP CONTROL PANEL FOR JEFFERSON PARISH SEWERAGE DEPARTMENT:		
1	1.00	EA	0001 Duplex Pump Control Panel to replace the existing control panel in station at Kawanee and Henican to include the following: NEMA 4x 304 SS enclosure painted white with aluminum dead-front, inner doors (66 inch H x 60 inch W x 24 inch D) Fan ventilation with hoods and screens (painted white) 1200 amp main breaker 600 amp pump feeder breakers Flexi-bar bussing (to maximize back panel space) Square D 3ka control power transformer Square D 30MM operators 2 Phoenix contact signal splitter 1 day of factory start-up service TO BE INSTALLED IN THE PANEL: 300HP Danfoss VFD 480V with key pad kit - existing 2 MAS 711 units with current Transformers 500A-5A 1 3MP2 Multismart VFD controller - with HMI 2 Level Transducers 4-20 MA output Flygt surge protection Startup	$53,469.00	$53,469.00

Non-Public Works Bid

AFFIDAVIT

STATE OF Louisiana

PARISH/COUNTY OF St. Tammany

BEFORE ME, the undersigned authority, personally came and appeared: Jeanne James, (Affiant) who after being by me duly sworn, deposed and said that he/she is the fully authorized Secretary/Treasurer Gulf States Eng (Entity), the party who submitted a bid in response to Bid Number 50-2012-125 to the Parish of Jefferson.

Affiant further said:

Campaign Contribution Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A _____ Attached hereto is a list of all campaign contributions, including the date and amount of each contribution, made to current or former elected officials of the Parish of Jefferson by Entity, Affiant, and/or officers, directors and owners, including employees, owning 25% or more of the Entity during the two-year period immediately preceding the date of this affidavit or the current term of the elected official, whichever is greater. Further, Entity, Affiant, and/or Entity Owners have not made any contributions to or in support of current or former members of the Jefferson Parish Council or the Jefferson Parish President through or in the name of another person or legal entity, either directly or indirectly.

Choice B X there are NO campaign contributions made which would require disclosure under Choice A of this section.

That no part of the contract price received by Affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for Affiant.

Jeanne James
Signature of Affiant

Jeanne James
Printed Name of Affiant

SWORN AND SUBSCRIBED TO BEFORE ME
ON THE 18 DAY OF Oct, 2017.

Notary Public

Printed Name of Notary

Notary/Bar Roll Number

My commission expires _____.

JEANNE M. BERGERON
Notary Public #134019
State of Louisiana
My Commission is for Life

CORPORATE RESOLUTION

EXCERPT FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF Gulf States Engineering Co Inc. INCORPORATED.

AT THE MEETING OF DIRECTORS OF Gulf States Engineering Co Inc INCORPORATED, DULY NOTICED AND HELD ON October 15, 2017. A QUORUM BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED, IT WAS:

RESOLVED THAT Jeanne James, BE AND IS HEREBY APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS AND TRANSACTIONS WITH THE PARISH OF JEFFERSON OR ANY OF ITS AGENCIES, DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES, CONTRACTS AND ACTS AND TO RECEIVE ALL PURCHASE ORDERS AND NOTICES ISSUED PURSUANT TO THE PROVISIONS OF ANY SUCH BID OR CONTRACT, THIS CORPORATION HEREBY RATIFYING, APPROVING, CONFIRMING, AND ACCEPTING EACH AND EVERY SUCH ACT PERFORMED BY SAID AGENT AND ATTORNEY-IN-FACT.

I HEREBY CERTIFY THE FOREGOING TO BE A TRUE AND CORRECT COPY OF AN EXCERPT OF THE MINUTES OF THE ABOVE DATED MEETING OF THE BOARD OF DIRECTORS OF SAID CORPORATION, AND THE SAME HAS NOT BEEN REVOKED OR RESCINDED.

Jeanne James
SECRETARY-TREASURER

10/18/17
DATE

JEFFERSON PARISH
Department of Purchasing

Michael S. Yenni
Parish President

Brenda C. Patel
Director

October 18, 2017

ADDENDUM # 1

Bid No.: 50-00121175

Bid Opening Date: 10/26/2017

For: One time purchase of a Duplex Pump Control Panel for Jefferson Parish Sewerage Department.

Answering a vendor question.

1) What manufacturer of pumps are in this station?

Answer: Flyght

Sincerely,

Donna Reamey

Donna Reamey, Buyer II
Jefferson Parish Purchasing Department

Bidders must acknowledge all addenda on the bid form. Bidder acknowledges receipt of this addendum on the bid form as indicated. Failure to do so will result in bid rejection.

This addendum is a part of the contract documents and modifies the original bidding documents and specifications. The contents of this addendum shall be included in the contract documents. Changes made by this addendum shall take precedence over the documents of earlier date.

General Government Bldg. -- 200 Derbigny St – Suite 4400 - Gretna, LA 70053
Office 504.364.2678
Email: Purchasing@jeffparish.net Website: www.jeffparish.net

Bid # 50-121175
SPECIFICATIONS
DUPLEX PUMP CONTROL PANEL
JEFFERSON PARISH DEPT. OF SEWERAGE
KAWANEE & HENICAN SEWER LIFT STATION

1. GENERAL

A. Provide a new Pump Control Panel at the Kawanee & Henican Sewer Lift Station, to interface with the existing system feed. Jefferson Parish personnel shall remove the existing panel (separate from this scope of supply) and the existing VFD's in that panel shall be re-used and field retrofitted into the new Pump Control Panel with a smaller footprint.

B. The new Pump Control Panel shall be provided to house the existing VFD's, Pump protection circuitry, and Multi-Smart Pump Controller/RTU/Display. The panel will be fabricated with a main Circuit Breaker, Pump Feeder Breakers, 3kVA Control power Transformer, and ancillary switches, pilot devices, relays, timers, etc., to duplicate the existing control panel functionality, unless otherwise specified below.

C. The new Control Panel will be powered from the existing power source. Metering equipment and service entrance rated main interrupt breaker/disconnect are existing, or to be furnished by others.

D. The existing Generator Receptacle and associated circuit breakers and interlocks will be removed, but not replaced as part of the new Pump Control Panel.

E. Existing panel demolition, rerouting, and provision of new conduits and cables, Concrete Pad Extension (if required), setting and mounting of new panel shall be performed by Jefferson Parish.

F. Transference of existing VFD's, to new Pump Control Panel shall be performed by Jefferson Parish, to ensure proper installation, cutover, and recommissioning of this equipment, in conjunction with the new Pump Control Panel to provide for a complete and functional system.

G. All of the equipment specified herein shall be of the latest and most modern design, and furnished by a single supplier. The supplier shall be responsible for the sourcing and correct operation of the equipment specified.

2. REFERENCES

A. The entire system shall be constructed in strict accordance with the latest published standards of NEMA, NEC. Wherever possible, new control system components shall be Underwriters Laboratory listed. All control hardware and software shall be factory assembled, wired, and thoroughly tested prior to shipment.

B. The control panel shall be in compliance with UL 698A "Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions". Control panel shall bear a serialized label showing compliance. The control panel submittal shall contain a copy of the front page of the control panel builders UL508A and 698A standard that shows their UL file number. The name on the front page of the UL Standard shall match the name in the title block of the control panel submittal.

C. While the use of U.L. listed components is encouraged, their use alone and/or the alternate use of a U.L. 508A – "Enclosed Industrial Control Panel" serialized label will not be accepted as an alternate to the "Enclosed Industrial Control Panel Relating to Hazardous Locations with Intrinsically Safe Circuit Extensions" serialized label specified above.

3. **SUBMITTALS**

A. The Contractor shall submit six (6) complete sets of the following:

1. Dimension drawings, wiring, and/or hydraulic drawings for field and pipeline mounted equipment.
2. Fabrication and nameplate legend drawings
3. Internal wiring and piping schematic drawings
4. System operational description

4. **CONSTRUCTION STANDARDS**

A. Wire Numbers – Each wire in the control panel shall be marked with a wire number that corresponds to the page and ladder rung of the schematic diagrams. A unique wire number shall be provided between component contacts and coils. Wire markers shall be Brady Thermal Transfer Self-Laminating Vinyl, by Grafoplast or Thomas & Betts, or approved equal.

B. Color Coding – Wires shall also be color-coded as follows: 120 VAC Line = black; Neutral = white; Ground = green; Switched 120 VAC = red; DC current carrying conductor = blue; DC non-current carrying conductor = white with blue stripe; Foreign voltage = yellow; Intrinsically safe = light blue.

C. Component Identification – Each component in the system shall be identified by a unique number that corresponds to its coil's page and ladder rung location on the schematic drawings.

D. Wire – AC control conductors shall be 600 volt and a minimum of 18 gauge. DC control conductors shall be a 300-volt and a minimum of 18 gauge. Control conductors shall be UL Type MTW rated for 105° Celsius. Analog conductors shall be 22 gauge shielded twisted three conductor, rated for 300 volts. Wire shall be Beldon 8771, or approved equal. Shields shall be grounded at the PLC or panel location. Power conductors shall be sized per UL and NEC standards and rated for 600 volts. Conductors shall be UL Type MTW, THHN or THWN rated for 90° Celsius.

E. Internal Power Cabling shall be High Flex or Flexi-bar bussing to minimize cabinet size while maintaining NEC cable bend radiuses. Cabling shall be sized for current ratings per the NEC. Cable shall be routed within the enclosure to minimize enclosure sizing as much as possible, while meeting NEC code.

F. Control Terminals – All field control conductors shall be connected to terminal blocks. Terminals shall have machine marked wire numbers. Connection of field control conductors directly to control panel components will not be accepted. Terminal blocks shall be rated for 30 amps at 600 volts. They shall be screw terminal type capable of terminating 10 to 26 gauge wire. Terminal bridge bars shall be provided when it is necessary to bridge multiple like terminals together. Terminals and accessories shall be Phoenix Contact "Clipline" by Allen Bradley or Weidemueller, or approved equal.

5. **ENCLOSURE**

A. All new control and reused power equipment shall be mounted in a 14-gauge, stainless steel, dual access, double door, NEMA 3R enclosure. The enclosure shall be finished with a white painted exterior to reduce sun-induced heat rise. A gasket shall be provided for each outer door. All internal components shall be mounted on back-to-back painted steel back plates. An aluminum inner door shall be provided for mounting of the power disconnect, VFD Keypad / Display, HOA, Pump Controller / RTU Display, ETMs, pilot lights, and reset button, as required.

B. The following enclosure accessories shall be provided:
   1. 3-point pad-lockable latching system for each door set.
   2. LED Work Light. Light shall turn on automatically whenever either exterior door is opened.
   3. Mechanical door stays on exterior doors.
   4. UL Listed Type 3R hooded vent kits with screens and 200 CFM or greater fan.
   5. Painted White.

C. Enclosure shall be sized sufficiently to allow for easy and safe access to all internal equipment. Enclosure shall be 66 inches H x 60 inches W x 24 inches D.

6. **POWER ENTRY**

A. Incoming power cables shall be terminated to the top side of the Main Circuit Breaker/disconnect. Conduit entry to Enclosure to be on either side towards the top to minimize cable bending.

B. Molded Case Circuit Breakers
   1. Main Circuit Breaker shall be 3 pole, 600VAC, 1200A, Square-D PJL36120 with Basic Electronic Trip Unit (non-interchangeable) and Square-D Operating mechanism (9421LW4).
   2. The Branch Feeder Circuit Breakers for each Pump shall be 3 pole, 600VAC, 600 A, Square-D MGL36600 with Basic Electronic Trip Unit (non-interchangeable) and Square-D Operating mechanism (9421LW4).

7. **LIGHTNING ARRESTOR**

A. The control panel shall be protected from electrical surges caused by lightning and high current/voltage surges. A surge protector shall be installed and connected to each leg of incoming service. The surge arrestor shall meet the following requirements:
   1. Designed to meet ANSI/IEEE C62.11-1987 requirements.
   2. Rated for not less than 10,000 amp surge current.
   3. Response time of not more than 50 nanoseconds.
   4. Three LED indicators for visual indication of the devices operational status.
   5. Built in fuses.
   6. Maintenance free, long life design.

8. **HEATER CONDENSATION/FREEZE**

A. A thermostatically controlled heater shall be provided to prevent condensation and maintain the control panel internal temperature above freezing. The heater shall be minimum 400-watt with a long life heating element. Heater shall be a Hoffman model DAH 40018, or approved equal.

9. **GFCI DUPLEX RECEPTACLE**

A. A GFCI duplex power receptacle shall be mounted inside the enclosure to provide a power source for use by an operator.
B. The GFCI duplex receptacle shall include a 15 amp circuit breaker to provide cutout on an overcurrent condition.
C. Unit shall incorporate GFCI fault test button and reset on the face of the unit.
D. Unit shall detect and indicate via face mounted LED if the line/load wiring is reversed.
E. Internal circuitry shall monitor the condition of the GFCI and will trip unit if a malfunction is present. Unit will not permit reset if the GFCI is not able to provide the necessary protection.

10. **POWER SUPPLY SYSTEMS**

A. The control panel shall be supplied with a DC power supply.
   1. Power supply will be sized so that under normal conditions, no more than 60 percent of its rated wattage output is used.
   2. The DC power outputs shall be protected by separately mounted replaceable fuses

B. Uninterruptable Power Supply System
   1. An Uninterruptable Power Supply (UPS) System shall be furnished. The UPS shall supply both regulated 24 VDC and 12 VDC power for powering control and sensor equipment.
      a. Unit shall be sized to provide battery back-up operation for a minimum of 4 hours during an incoming service power interruption.
      b. System will allow controller, sensors, and telemetry equipment to remain operational under battery back-up.
      c. The UPS shall monitor battery life and provide indication via LED to replace battery.
      d. The battery shall be no maintenance gel type cell and easily replaceable. UPS will not be damaged in the event the battery is connected in reverse polarity.
      e. The DC power outputs shall be protected by separately mounted replaceable fuses.

11. **PUMP CONTROL SYSTEM**

The System Supplier shall provide a Duplex Pump Control system that shall control the pumps in an energy conservation mode of operation. The system shall be capable of adapting to changing inflow conditions and shall automatically regulate pumped outflow based on inflow conditions, and shall seek an optimal energy efficiency for the pump station. This shall be accomplished integrating the existing Variable Frequency Drives

with the new controller. The supplied system shall be SCADA ready for integration with the Parish SCADA system. This system will incorporate the functionality as noted in the following sections. Pump Control System shall be furnished with all necessary power supplies, processors, memory, process I/O cards, communication ports, etc. to meet its specified functions, requirements, and environmental conditions. All Pump Control Systems shall meet or exceed the detailed specification requirements listed herein.

Touch Screen Interface to the SCADA Interface and VFD shall be, as follows:

A. Minimum size shall be 6 inch

B. Minimum color 256K

C. Unit shall be rated NEMA 4, sealed membrane, suitable for corrosive sewerage environment.

D. (0-60) degrees Celsius operating temperature

12. QUALITY ASSURANCE

Pump Control System Manufacturer: The system shall be furnished by a manufacturer that has experience manufacturing equipment and control systems designed specifically for the wastewater industry. Support for the system shall be available directly from the manufacturer.

a. Warranty: The Pump Control System manufacturer shall provide a 5 year warranty with the main control unit. This warranty shall be available in writing directly from the manufacturer. The warranty shall provide for direct on-site replacement of the entire unit, complete with the original program and configuration, and the Operator Interface, if shown to be defective. The replacement unit shall be available without requiring that the original unit first be removed and returned to the factory.
b. Telephone Support: The system manufacturer shall provide telephone support for questions related to any aspect of the controller, including general use, application-specific issues, programming, and use of the programming software. This support shall be available directly from the manufacturer at no extra charge with the purchase of a controller.
c. Operating Conditions: The Pump Control System shall operate correctly under an ambient temperature range of -40 to +150 degrees Fahrenheit. Coatings on connectors, component leads, and other materials used in the construction of the system shall be substantially resistant to atmospheres containing significant amounts of Hydrogen Sulfide gas and Chlorine gas. Each system shall have passed testing and be certified in writing by the manufacturer to be acceptable for use in wastewater treatment environments. All printed circuit boards shall have a conformal coating.

13. **INPUT/OUTPUT CONFIGURATION**

A. Analog Inputs: Inputs shall be provided for wet well level.

B. Digital Inputs: Inputs shall be provided for primary station power (three phase) monitoring and failure, wet well back up level alarm acknowledge, and monitoring signals for each pump.

C. Digital Outputs: Outputs shall be provided for the common alarm lamp and each of the following, as pertains to the furnished system:

1. level transducer fail

2. communications fail

3. pump fail

D. Analog Outputs: Provide where called for in the drawings. If analog outputs are not required, the system shall have the capability to provide this functionality either by built in analog outputs, or adding an analog output card. Provide surge suppression on all analog output signals that extend outside the enclosure. Analog outputs shall be as specified and provided as a minimum.

E. Pump Station & VFD Controller: The Pump Station & VFD Controller shall provide "Out of the box" control of a typical pump station, with an intuitive user- interface. The product shall come with pre-built configuration wastewater pumping parameters which are selectable via the user interface, including:

a. Functionality for advanced pump control of up to 6 pumps
b. Pump mode, for each pump, between Auto/Manual/Off
c. In manual control (semi-automatic manual) pump switches off at deactivation setpoint and reverts to Auto mode to prevent accidental pump run on
d. To pump beyond off set point in manual button must be held down (full manual)
e. Setpoint adjustment for pump activation/deactivation and level alarms
f. Level device from 4-20mA, conductive probe or remote level
g. Redundant level device handling

F. VFD Control Algorithm – The system shall provide the following programmed functions when connected to a VFD:

- Pump Cleaning Functions - When reading current from the VFD or from current transformers the system may detect pump clogging and implement a self-cleaning function.
- Hard Clog Cleaning: When motor currents exceed a pre-set limit, the VFD is stopped then sent the reversing and forward run commands timed to clear

the debris from the impeller. This can be performed one or more times until the debris is cleared. Once the cleaning function is complete the system returns to normal operation.

- Sump Cleaning Function - To insure solids and grease do not build up in the sump, the controller shall have the option for a sump cleaning function.

  The sump cleaning function may be configured to operate on one of the following:

  1. Set number of pump cycles
  2. One of four timers - The sump cleaning function shall operate the pumps at full speed until one of the following options is met.
  3. Pre-determined level setpoint
  4. Low power factor as read from the VFD or calculated from CT's
  5. Low motor current as read from the VFD or CT's
  6. Low flow rate as read from flow meter
  7. Pre-determined amount of time

- Pipe Cleaning Function - Adjustable start-up sequence allows running motor at full speed to clear debris in the pipe and prevent the motor from clogging. This feature allows for the VFD to be sent a speed and time reference to run the motor at during the beginning of each cycle, to allow for the clearing of debris in the pipe and to prevent pump clogging. The initial speed reference is 100 percent for 10 seconds, but is configurable to meet system requirements.
- Energy Efficient Speed Reference - The VFD algorithm will find the speed at which the outflow rate matches the inflow rate, which may run the pump at a more efficient rate than full speed. This will also minimize pump starts and stops; and reduce wear and tear on bearings, seals, and valves. The function herein will allow:
  - Ability to run at a set speed when in manual mode.
  - Automatic speed adjustment when multiple pumps are running; so not to increase flow rapidly, and reduce water hammer.
  - Runs all pumps at the same speed reference.
  - Speed reference is controlled by 4 parameters
  - Start speed as a percentage of total speed
  - Full speed level setpoint
  - Off level/minimum speed
  - Speed compensation
- Station optimization including:
  - Max off time (odor reduction)
  - A timer that shall start a pump after the configured time has expired and will run one or more pumps to the pre-set off point
  - Maximum pumps to run (overload protection)
  - Pump controller shall have a configurable maximum number of pumps allowed to run at a single time and whether to stop a running pump and start a lag pump or to prevent a lag pump to start.

- Maximum starts per hour (pump protection)
- Inter-pump start and stop delays
- Pump controller shall provide delays for the following:
  - Start- start delay to prevent multiple pumps from starting at the same time and overloading electrical and hydraulic equipment
  - Stop- stop delay to prevent or reduce the effects of water hammer
  - Stop- start delay to prevent a pump from starting while a pump is ramping down and possibly damaging valves
  - Start- stop delay to prevent a pump from stopping shortly after a pump has started and possibly damaging valves
- Maximum run time (turn off inefficient or partially blocked pumps)
- Pump controller shall shut a pump off and optionally set an alarm if a motor has been running longer than normal
- Blocked pump detection
- Pump controller shall have configurable option to detect pump blockages and take action when a pump blockage occurs using one or more of the following options:
  - Low power factor detection
  - Lag pump start counter
  - Low metered flow rate
- Optional features may be required
- Well washer controls
- Well clean out (periodic pump down to snore point)
- Pump controller shall have the ability to pump to the snore point using the following methods:
  - Configurable amount of time to pump below the off point
  - Pump down to a configurable level point
  - Detect low motor power factor
  - Detect low motor current consumption
  - Pump groups with different configurations (e.g. alternation schemes) for each group
  - "Locked level" alarm to indicate level device problem
  - User-defined percent change within a time period
  - Different values for low use, high use times (user defined)
  - Flow measurement/calculation
  - Calculated flow via draw down test
  - Not available when using VFD to control motor speed
- Alternation schemes including:
  - Fixed lead/duty
  - Alternation
  - Alternation N:1 (e.g., 3:1)
  - Run most efficient pump, N:1 ratio, e.g. more efficient pump runs 20 times for each operation of the less efficient pump(s)
  - Alternation by hours run or starts
  - Pump decommission/commission

- Decommissioned pump automatically removed from control algorithm, alarms, displays, etc
- SCADA tag flags decommissioned status
- Six profiles of setpoints for spill management, off peak pumping, tariffing, etc
- Automatic profile change on date/time
- Selectable from SCADA, digital input, logic tag or faceplate
- Profile includes some pump control parameters — maximum number of pumps, maximum run time, maximum off time
- Datalogger for user-defined faults and events (process values)
- 50,000 events to internal flash memory
- 10,000,000 events by writing direct to Compact Flash card
- Download event and fault log as csv to Compact Flash for Excel analysis
- ftp transfer of event and fault log as csv for Excel analysis
- 3-phase supply monitoring and supply protection
- Under-voltage
- Over-voltage
- Phase fail
- Phase rotation
- Monitoring of dc supply, battery voltage, and internal temperature
- Energy, power, and pump efficiency monitoring:

kW, kVA, power factor, kWHr, KVAH calculation for each pump

- pump efficiency calculation (liters or gallons per KWHr) for each pump
- Motor protection including:

3-phase current monitoring for each pump

Over- and under-current trip

Ground/earth fault

Current phase imbalance fault

I^2T fault

Fault module with flexibility for any fault to hold out pump(s) or be display only auto-restart after user-defined time subsequent to fault condition clearing.

Auto-restart user-defined number of times (subsequent to fault condition clearing) before locking out.

- Manual/ SCADA reset required
- Built in Web Server

- Remote control via SCADA for changing mode of pumps (auto/off/manual)
- reset of pump and station faults
- changing pump and alarm setpoints
- changing setpoint profiles
- Security
- Admin user sets PINs for access to configuration of the unit
- Automatic data logging of who has entered the configuration menu.
- Automatic logging of all unsuccessful login attempts with date/time
- Digital input option, e.g. key switch, for access to configuration menu
- SD and USB port allows firmware upgrades
- Save/load configuration (allows backup to be restored, or configuration copied from another station)
- Download data logger in CSV

- Export/import Modbus and DNP3 points list in csv format
- Programmability
- The product shall have the option of IEC61131-3 and IEC61499 compliant PLC programming language to enhance/interact with all the modules in the pump station manager.
- The product shall have the option of a simple logic engine to enhance/interact with all the modules in the pump station manager.
- The I/O shall be expandable to many hundreds of I/O points per unit.
- Available I/O types shall include:
- Digital inputs (voltage free input), also configurable as counters
- Digital outputs (240V, 5A resistive)
- Analog inputs (10bit)
- Analog outputs (10bit)
- Seal leakage sensors (capacitive and conductive)
- PTC Thermistor
- Conductive probe (for liquid level sensing)
- Insulation resistance test (IRT) to 1000v
- 3-phase current monitoring, derived from CT's, 0.5 percent resolution
- 3-phase supply monitoring, 0.5 percent resolution. Up to 630V phase to phase.
- User interface - The field hardware shall include a user interface for operations and configuration. The display shall provide status of most aspects of the pump station, control of pumps, resetting of faults, and configuration of parameters. The following parameters shall be displayed on the main screen:
- Level in user definable units eg percent, meters, or custom units
- Setpoints for alarms and pump start/stop
- Pump running/stopped
- Pump available/unavailable
- 3-phase current for each motor
- Faults

- 3-phase supply
- Date/time
- User-configurable option to display pump efficiency, flow rates, total starts, total hours run, and other parameters.
- The screen will have buttons to allow the user to access Faults, History, Information, and Settings.
- Hours Run accumulators for each pump & the station with the following comparisons; last minutes run, this hour, last hour, today, yesterday, this week, last week, total hours run with start accumulators for each pump; and, the station with the comparisons of this hour, last hour, today, yesterday, this week, and last week
- Power & efficiency
- pump efficiency in liters or gallons per kWHr - or KVAH
- power in kW, KVA
- power factor
- energy accumulators per pump in KWHr and KVAH
- Insulation resistance value for each motor from 1000v test
- Status of all I/O
- Digital I/O open/closed and accumulator
- Analog I/O mA and scaled
- 3-phase voltage, current, frequency, phase angle, power factor
- Database viewer to view all data points/tags in real time
- Communications stats
- Control - The following aspects of the system, as a minimum, shall be controlled intuitively through the user-interface:
- Pump mode, for each pump, between Auto/ Manual (Hand)/ Off
- Pump fault reset
- Level alarm reset
- Fault screen - The main screen shall include a Fault button which takes the user to a Fault screen and allows them to check all current and unacknowledged alarms. The fault screen will detail the fault (e.g. contactor fail, seal fault, motor overtemp, over-current, etc.) along with date/time each fault occurred and cleared. A reset option for a fault will be presented to the user when faults can be acknowledged/reset.
- History screen - The main screen shall include a History button which takes the user to a History screen
- View all date/time stamped faults and events
- Filter by pump or other station parameters, by time period
- Export via CSV for analysis in Excel
- Configuration - The Configuration interface will allow the user to save and restore configurations onto the unit itself or onto an SD card or USB storage device, to allow easy configuration from saved versions (or copying settings from one site to another). The unit will allow the user to backup system log files, alarm and event log files, and custom scripts via the SD or USB ports. The unit shall allow for the import of DNP3 and Modbus point lists and custom logic scripts via the SD or USB ports. Firmware upgrades will be possible by copying the upgrade image onto a SD card, or USB storage

device, then inserting into a field unit and cycling power. The configuration of the unit shall allow the user to save a known good configuration on the unit that may be restored at any time. The user interface shall allow intuitive configuration of the system, including as a minimum:

1. Setup Wizard to allow a complete configuration (display, I/O and configuration of functional blocks) by the user answering simple questions
2. Set-points, including alarm and pump set points to include delays
3. Alternation/ fixed sequence and grouping of pumps where necessary
4. Configure I/O
5. Assign primary/backup level to any input, e.g. 4-20mA or conductive probe
6. Assign pre-defined (or user-defined) faults, e.g. thermal overload, contactor fail, to any digital input
7. Zero and span Analog inputs
8. Set Digital outputs to change state with any digital tag in the system
9. Set Analog outputs to follow any Analog value, including primary level
10. Fault configuration for each fault to either display only
11. Manual/SCADA reset before pump becomes available
12. Auto-restart (after fault condition clears) with configurable restart time
13. Auto-restart user-selectable number of times within time window before locking out
14. Customized text for fault and event name
15. Pump station optimization parameters such as Max off time (odor reduction)
16. Maximum pumps to run (overload protection),
17. Maximum starts per hour (pump protection)
18. Inter-pump start and stop delays
19. Maximum run time (turn off inefficient or partially blocked pumps)
20. Well clean out (periodic pump down to snore point)
21. Random duty start (random time after activation point reached before pump starts) to reduce grease build up
22. Optimization parameters applied differently to different groups of pumps if required
23. Supply protection
24. Under- and over-voltage alarm points
25. Volts phase imbalance and volts phase rotation
26. DC-supply alarm point
27. Motor protection
28. Under-currentOver-currentGround/earth fault
29. Phase fail I^2T protection
30. Communications ports, speeds, and addresses

- Communications – The unit shall provide communications ports that are integral to the unit. The system shall support a variety of media and communications networks, including TCP/IP, UDP, RS232, RS485, Private Radio over RS232, PSTN, Wireless LAN, Cellular Data, Cellular Voice. At a minimum, the unit shall provide the following ports and protocols:
    1. Two Ethernet ports to 10Mbit/s
    2. Two RS232 ports to 115kBit/s
    3. Two RS485 ports to 115kBit/s
    4. DNP3 Master & Slave – Level 2 Compliant for change of state reporting, native date/time stamps for each data point, event buffering for different data classes; DNP Security
    5. MODBUS Master & Slave including MODBUS TCP, MODBUS RTU, MODBUS ASCII
    6. SCADA Full Remote Control of Pump Station - Pump control and configuration tags allow integrated remote control via SCADA including:
        - Start / stop pumps (change mode to auto/ off/ manual)
        - Reset pump and station faults
        - Change pump & alarm setpoints
        - Change setpoint profile

G. RTU Monitoring System –FOR CELLULAR MONITORING WITH PUMP CONTROL

a. The Solid State RTU shall be based on a robust, current technology hardware platform allowing utilization of the latest advances in technology and permitting the most open programming and communication architectures. The system shall be modular and scalable and capable of being programmed to function as described herein.

b. Functional Description of the RTU - The unit shall function to communicate with the pump station control system as follows:
    1. The RTU shall read internal MODBUS registers of the existing equipment and shall provide the data to be communicated to a cloud based control and monitoring system.
    2. The control system shall be provided with a UPS and battery backup system to allow communication to a cellular based SCADA system to communicate station status during periods of power outage.

c. RTU Capabilities and Features:
    1. The RTU system shall include a real time of day time clock with battery back-up for time stamping of data log records and scheduling of periodic time of day based events. Clock shall not require reset after a site power failure has occurred.
    2. The RTU shall store system parameters including, logic configuration, set points, time delays, alarm and event data, counters and totalizers, etc. in field programmable (FLASH) non-volatile memory. Sufficient non-volatile memory must be provided to

protect at least 8,000 variables. The RTU shall also provide enough protected memory for time stamped data logging of up to 50,000 process values. This data shall be unaffected by power interruptions.

3. The RTU shall have enough processing power and working (DRAM) memory to enable high-level programs such as Internet Web Servers to operate efficiently without affecting other simultaneous multitasking operations.
4. The RTU shall be furnished with a minimum of 6 communication ports with true multitasking and allow simultaneous support of all ports. Ports can be configured for local I/O, Operator Interface/display support, LAN/WAN, etc.
5. The RTU processor shall meet the following as a minimum:
    - CPU – Clock speed of 500 MHz capable of 900M IPS and 3.5G FLOPS
    - 16 MB – 32 bit Dynamic RAM
    - 64 MB FLASH
    - 256 MB Static RAM
    - 2 (Two) Ethernet ports (RJ45)
    - 2 (Two) RS-232 Serial Communications (115 KB PS) (DB9)
    - 2 (Two) RS485 Serial Multi-Drop Communications
    - 1 (One) Local I/O port CANBUS
    - 1 (One) Display Port
6. The RTU shall not require any specialized tools for removal of the unit. System components including RTU, power supplies, etc. shall be DIN rail mounted. Terminations shall be via plug in connectors facilitating quick field replacement.
7. RTU and associated I/O modules shall meet national and international safety standards including UL, CSA, and CE.
8. The RTU shall operate from a 12-24 VDC power source. A battery and charger shall be supplied to power the master and remote unit during 120 Volt service power outage conditions, as previously specified.
9. The RTU shall have an operational temperature range of -10° Celsius to +60° Celsius (14° Fahrenheit to 140° Fahrenheit) under relative humidity conditions of 5 to 95% non-condensing. Storage temperature range up to 90° Celsius (194° Fahrenheit)

d. Software: The software shall have a high performance open source software architecture that utilizes a true multitasking operating system running a combination of standard and specially designed for wastewater application software modules. The system provided shall utilize an integrated system approach providing a comprehensive common configuration tool for all components within the system, including I/O, Processor, Communications, and Operator Interface Display. The architecture shall permit all system components to be configured, simulated, tested, and downloaded from one terminal to all system components.

e. The operating system shall be multitasking and allow a minimum of two separate programs to run simultaneously without affecting each other.

f. RTU's provided under this specification shall be capable of performing the necessary logic to control the system as previously defined. These capabilities shall include, but not be limited to the following:

1. Discrete input/output

2. Analog input

3. Analog output

4. Timers

5. Data Logging

6. Latch/unlatch relays

7. Counters

8. Totalization/Integration

9. Time of Day Control

g. RTU's shall be capable of performing diagnostic functions. CPUs shall continuously monitor the functionality of the system, and record errors and specific system events. A diagnostic buffer shall retain fault and interrupt events.

h. Each RTU shall have memory protected, built in historical archiving/data logging of system alarms, events, and process variables. Data logger shall be able to log data based on time or an event. RTU shall have enough memory allocated to allow 50,000 time and date stamped discrete and/or analog values to be archived. The historical archive shall allow the oldest data to roll off the system as memory is used, keeping the 50,000 most current data points available. Process point time stamping frequency shall be selectable within the configuration software. It shall be possible for the archived data to be exported in CSV format allowing use with standard spreadsheet and data base software applications.

i. Each RTU shall have built in web server capability, allowing system information to be stored in a format that allows for easy access and viewing with standard Windows™ based browser. This information shall be accessible locally or remotely.

j. RTU Communications Capabilities:

1. The RTU system shall utilize an "open" industry non-licensed standard communications protocol that will permit interface with other equipment that may not be supplied by the same manufacturer. Protocols that are proprietary and closed ended will not be accepted. Upon request, the system supplier shall provide documentation describing the supplied communications protocol so that it may be used in future telemetry additions to insure interface-ability of other third party RTUs.
2. The system must be able to simultaneously support multiple communications protocols. The system supplied, as a minimum shall be able to supply "open" and Modbus RTU/ASCII (Remote/Slave) output data via RS-232, 485 and Ethernet format, thus insuring a primary means of interfacing with non-related equipment.
3. The RTU system shall allow operations over multiple (LAN/WAN) communication media, affording the most efficient and reliable solution including; DC metallic wire pair, dedicated leased voice grade phone line, standard dial up phone line, wireless cellular dial up system, cable TV, Fiber optics, Ethernet 10/100 BaseT, VHF Radio, UHF Radio, Dedicated Microwave Radio, and Ethernet Wireless. System communication architecture can be based on any one or a combination of these media. The communications speed shall be set to the highest speed allowed by the selected media.
4. The system shall support multiple modes of operation, allowing highest possible system reliability and real-time response including; standard polling cycles, peer-to-peer, quiescent (Report on exception). System communication architecture can be based on any one or a combination of these modes of operation.

5. The RTU system shall employ a high level, efficient, secure communications protocol for communications between Master Telemetry Unit (MTU) and Remote Telemetry Unit(s) (RTU). Systems utilizing communications protocols with less capable error detection/rejection capabilities shall not be suitable for this application and will not be accepted.
6. The RTU system shall allow local or remote configuration of RTU troubleshooting without the need to be onsite. The system protocol shall support remote upload and down load file transfers between the master unit and associated RTU's, where applicable. File transfer function shall provide reliable means of remotely transferring RTU configuration files so that any RTU configuration can be uploaded through the selected telemetry communications media to the online PC via the MTU, modified and then downloaded to the RTU.

k. Input/Output (I/O) Systems:
1. The RTU system shall have I/O resources to support a wide variety of applications without needing to depend upon alternate technologies to meet various system data requirements. Each RTU shall be supplied with the required I/O to meet the specified requirements and allow for a minimum of 100% spare capacity for future expansion.
2. The RTU system shall support a wide variety of modular I/O with various configurations to permit the most efficient use of I/O hardware and panel space. I/O modules shall be available for local I/O (within control panel), remote I/O (RS-485 based distributed outside of the control panel), and Ethernet based I/O (Distributed I/O on high speed in plant network or wireless Ethernet). Each I/O module shall be DIN rail mounted, have compression wire type terminals capable of accepting 14 AWG wire, have wire identification markers, and I/O wiring diagram. Each module shall include diagnostic LEDS indicating module operational and I/O status. Each I/O module shall be electrically isolated, meet IEEE-472 (ANSI C37.90) surge withstand certification, shall be removable under power, and easily field replaced with a spare module requiring no software/hardware reconfiguration adjustments. Each module shall be safety keyed to insure proper installation. I/O modules shall permit installation and operation in hazardous locations as classified under UL, CSA Class 1, Div. 2, Groups A, B, C & D.
3. Remote I/O modules shall be connected to the RTU by high speed serial communications. Remote I/O modules shall support multiple communications protocols, including Modbus ASCII and RTU, allowing connection to any device supporting these protocols.
4. Ethernet I/O modules shall be connected to the RTU by on board Ethernet 10/100 BaseT connection port. Ethernet I/O modules shall support multiple communications, including TCP/IP, Modbus ASCII, and RTU, allowing connection to any device supporting these protocols over standard Ethernet backplane.

H. SCADA SOFTWARE –FOR CELLULAR COMMUNICATION

GENERAL - The SCADA HMI will be based on a well-supported global SCADA platform, accessible via mobile devices such as tablets and smart phones, as well as any PC running Internet Explorer version 5 or higher. The software shall provide the following:

a. System Configuration/Daily Operations

b. Software configuration and operational actions shall be protected from unauthorized access by a password/pass-code security system. The security model must be centralized, such that each user may use the same password to access the following SCADA features:
    1. Development environment
    2. Runtime displays
    3. Alarm management
    4. Alarm dialer (incoming and outgoing calls)
c. Software help manuals shall be provided to assist operators and administrative personnel with daily operations and software configuration. The latest versions of all manuals shall be made available for download from the software manufacturer's website.
d. Graphics and Displays
e. Software shall support both animated and static graphic objects. Animated graphic objects shall provide real-time process information to the user via displays. Alarms and process data depicted on displays shall be updated immediately upon receiving new data.
f. Standard tag types with graphics shall be provided for the following:
    1. Analog/discrete inputs
    2. Analog/discrete outputs. Outputs sent to field devices must include feedback.
    3. Multi-position switches. Position changes sent to field devices must include feedback of status received and verification of field action taken. For example, a switch intended to turn on a pump shall generate an alarm if the pump running status is not received within a predefined timeout.
    4. Alarms
g. Software shall include pre-built displays for standard HMI features. The following pre-built displays shall be provided, as a minimum:
    1. Alarm display that can be filtered by name. Includes current, unacknowledged, disabled, and history
    2. Trending/Tabular viewing of historical data
    3. Report creator
h. Software shall include a menu for navigating from one display to another. Menu shall be configurable to allow logical grouping of displays where necessary.
i. Operators, with sufficient security privileges, shall have access to system set points and control points, and shall have the ability to modify these points.
j. It shall be possible to determine the properties of any I/O value displayed by selecting it with the mouse. This shall be done in real-time and shall display the following data:
    1. Name, description, and logical system area
    2. Scaling of field data
    3. I/O address
    4. Alarm properties
k. Software shall support background bitmaps on graphical pages.
l. Software shall be capable of displaying multiple graphical windows simultaneously.

HISTORICAL AND REAL-TIME DATA MANAGEMENT

a. Software shall provide historical data storage. A synchronization scheme shall be included, ensuring an exact copy of all historical data resides on three server workstations. In the event that the primary or backup historical data storage servers are not synchronized, the outdated server will backfill all missing data from the server with the most recent historical data.
b. The system will maintain all tag properties in a relational database.
c. Software shall display historical and real-time data in both plot and tabular format. Historical and real-time plotted values shall be shown in a continuous, uninterrupted, scrolling fashion. These shall be displayed in strip-chart style with the vertical axis depicting the variable value and the horizontal axis representing time. Each display shall be scaled in appropriate coordinates for the specific tag being monitored. The plot's time frame shall be operator selectable from a minimum of one second to five years. Time intervals shall be clearly marked on the x-axis with date/time stamps and shall scroll with the data.
d. User shall be able to see the value of plotted tags for any selected point in time.
e. Software shall be capable of displaying an unlimited number of analog and digital tag plots on a single display. Color shall be used to differentiate between tags. Means must be provided to quickly determine the name and description of each tag displayed.
f. Scaling of each displayed tag plot shall, at the user's choice, be either independently configurable or shall follow the scaling of the tag. Changing the scaling of the tag plot shall not affect the scaling of the tag.
g. Where data is not available over duration for a particular variable, data plots shall show no data. At no time shall the gap be replaced with a connection between the last good value and the next good value.
h. Means must be provided for the following:
    1. Stop the plots from scrolling.
    2. Zoom in both the time (x) and value (y) axis
    3. Pan/Scroll along the time axis or select a particular date to display
    4. Move analog tag plots vertically (in the value axis), either individually or as a group
    5. Display statistical data, including average, minimum, and maximum values, for each plot.
i. Ability to print displayed plots shall be provided.
j. Presently viewed plot values shall be exportable to comma separated value (.csv) file, for use by 3rd-party data analysis software.
k. Software shall be capable of saving groups of tags for later recall. There shall be no limit to the number of these groups.

ALARM AND EVENT MANAGEMENT

l. A minimum of the last 10,000 alarms and events shall be stored. A synchronization scheme shall be included, ensuring an exact copy of all alarm history resides on three server workstations. In the event that the primary or backup alarm history

storage servers are not synchronized, the outdated server will backfill all missing data from the server with the most recent alarm history.

m. Alarms and events records shall include:
    1. Time/Date stamp
    2. The name and description of the alarm tag
    3. Priority
    4. Status of Alarm (i.e. Active, Acknowledged, Cleared). Alarm Acknowledgement records shall include the name of the user.

n. When an alarm condition occurs, the following sequence shall be provided:

1. An audible tone shall annunciate from each of the clients that have access to this alarm. This audible tone shall repeat until the alarm is acknowledged.
2. The alarm shall be added to the alarm history.
3. In the event the alarm has not been acknowledged within a user configurable time period, a telephone dialer shall begin notifying users on predefined rosters.

o. Software shall provide user-configurable settings for dead band and delay on analog alarms.

p. Users must be notified, both visibly and audibly, of the occurrence of an alarm, regardless which display is presently being viewed.

q. An alarm shall be acknowledged by selecting the alarm event from the alarm summary interface and then choosing an 'Acknowledge' button. Alarms shall not be acknowledged simply by clicking on the alarm event. This two-step approach alleviates inadvertent alarm acknowledgement actions.

r. Alarm acknowledgement shall immediately be propagated to all user interfaces.

s. Operators shall be able to filter the alarms display to show current, unacknowledged, disabled, or historical alarm. Alarms shall be filterable by priority or by alarm areas/groups.

t. Software shall allow the project to be split into functional areas such that the alarms a user sees/acknowledges are determined by the areas to which the user has access.

u. The application shall include a telephone dialer. The dialer shall support text-to-speech, and be automatically synchronized with the tag database at all times.

v. The telephone dialer shall share the SCADA system security, requiring users to enter a security code from a telephone keypad to access data and to acknowledge alarms. All alarm acknowledgements shall be recorded in the application event log.

w. The telephone dialer shall be capable of contacting different groups of system users based upon the service needs of the alarm. Each group should be capable of making up to 30 actions (email, SMS or text-to-speech phone call). Once the list of actions is complete, it must be able to repeat or activate another group of actions. Systems shall be able to make groups active/inactive to allow for shift changes and duty rosters. Changes to users in groups and active/inactive status changes shall be made without stopping and restarting the application or computer. There shall be no limit to the number of active and inactive groups. The telephone dialer must be able to switch between groups based on time of day or changes in system values. Changes to these groups shall require sufficient user privileges.

x. The software must be configurable to detect rapid changes in value or lack of change over a defined period.

REPORT GENERATION SYSTEM

a. Software shall be capable of producing reports using historical data. Reports may be created for one-time use.
b. Report generation shall be invoked either on demand, by a monitored event, or on a scheduled basis.
c. The report generation system shall be field configurable, allowing an operator to create, modify, generate reports, and export data to third party software. The report generation system shall be capable of displaying reports to the user interface display or of exporting files per the following:
    1. To a comma separated value (.csv) file
    2. To a text file
    3. Directly to a new MS Excel spreadsheet
    4. Via e-mail
d. Reports generated via an internet client shall be able to be printed to a local printer.
e. Reports shall be able to display any analog, digital or calculated tag data from the historical database.

APPLICATION UPGRADES/SUPPORT/DIAGNOSTICS/DEBUGGING

a. Users shall be notified of application upgrades and the user shall not incur a cost for the upgrade.
b. Support must include phone and email contact.
c. Training shall be available for users of all levels (i.e. Operators, Developers, Administrators)
d. Security - A password protected security system shall support an unlimited number of users, each user having a set of configurable privileges. Privileges for system configuration, data viewing, and operational activities shall be enabled or disabled on an individual user basis.
e. User accounts shall be able to be duplicated and assigned to new users.
f. User passwords shall be encrypted using an algorithm that shall render their file storage unreadable.
g. User passwords must be configurable to exceed a minimum length, contain alphabetic, numeric or special characters, or expire after a pre-set period.
h. System shall allow creation of additional security privileges where necessary. The system shall allow an unlimited number of additional privileges.
i. Changes to user access privileges can be made while the application is running and shall become effective immediately. Networked users whose accounts have been altered shall be affected by the changes immediately, not after stopping and starting the application.
j. Security system shall be multi-session. It will validate multiple users simultaneously and record their session activity concurrently for all users.

INTERNET CONNECTIVITY/HANDHELD DEVICE SUPPORT/MONITORING

a. Internet connectivity shall not require the installation or configuration of a 3rd party Internet Server product (e.g. Miscrosoft IIS, Apache).
b. On-line configuration changes shall be pushed immediately to all Internet client interfaces without requiring the browser interface to be restarted or refreshed.

c. Internet clients shall require only the latest version Microsoft Internet Explorer to communicate with the application. Internet clients shall require no software to be manually installed. Upon first contact with the Internet server serving the application, the Internet client shall automatically synchronize with the application and download any necessary files. All subsequent connections to the server shall synchronize the Internet client with the server.

d. Internet client shall cache displays in order to reduce display access time.

e. Internet client interfaces shall have graphical displays identical to the standard client and server interfaces and shall not require separate development time or a separate development interface. The automatic display generation process shall not distort the graphical layout of any display.

f. Software shall support access to alarms and real-time status information via hand-held devices.

g. The HMI system shall include monitoring and alarm notification for a period of 3 years from the date of commissioning. Pricing for monitoring shall be included in the bid price for the equipment.

REDUNDANCY AND LOAD SHARING

a. Software shall support a minimum of three levels of redundancy for I/O communications (i.e. primary server, 1st backup server, 2nd backup server). Software shall support a minimum of two levels of redundancy for all other services. In the event of primary server failure, software shall be capable of automatic fail-over to a backup server. No manual intervention shall be required.

b. Software shall support distribution of services across any number of computers to facilitate load sharing.

c. All servers shall be aware of which server is in control of each software process. No two servers shall perform the same function at the same time. This ensures efficient use of network communications and connections to I/O devices.

d. Software must not require each redundant server to use a second network card to monitor the status of the primary server.

e. Backup servers shall be capable of load-sharing the various system operations (including I/O communications and data logging, alarm management, network communications management, security management).

f. The supplied HMI will have the following features already setup and display all values supported by the controller:

Screens

- Station overview, including: summary alarms, level alarm, level device fault, WAN comms fault, supply fault, numbers of pumps, pump summary alarm comms, statistics, 3-phase voltage level, station name, and ID.
- Pump status, including: auto/off/manual (hand), detailed pump fault status, thermal, seal, delay fail input, critical fault, non-critical fault, under-current, over-current, phase fail, earth fault
- Control for:
  pump mode – auto/off/manual (hand)

pump fault reset

detailed pump data

3-phase currents (where available at site)

power and kWh (where current monitoring module installed at site)

accumulators

Flow data

- Derived flow data (if module installed in field hardware), or
- From flow meter if installed

Configuration

- Configuration screens for:
  Changing setpoints of all pumps and alarms

  Changing between profiles in the field hardware

Pre-configured report

- The system will include standard reports relevant to pump station networks including:
  Daily station report

  Monthly station report

LEVEL SYSTEM BACKUP

General

The backup system shall consist of a non-mercury float switch system that shall operate if the analog level transducer system goes out of range or becomes inoperable. Back up control system shall be hard wired on a separate dedicated circuit. The backup control shall run the pump or pumps for the time required to draw down the well to the pump stop level. Upon pump reaching the off set point, the pump or pumps shall deactivate and resume normal operation.. Should the primary level transducers continue to exhibit failure, the system failure shall be annunciated on the HMI and the SCADA system shall also be notified.

Pilot Devices

A. Selector switches shall include removable 10 Amp, 600-volt double make/double break contacts. All pilot lights, selector switches, and push buttons shall be rated for NEMA/UL 4 applications. They shall be not less than 22.5mm diameter.

B. Contact blocks/terminals shall be finger safe, meeting IP20 standards.
C. Operators shall be rated for a minimum life of 500,000 operations with a MTBF of less than 1 fault per 10 million operations.
D. All Pilot devices shall be clearly identified by a phenolic nameplate with black surface and white letters not less than 3/16 inches in height, placed over the associated pilot device.
E. The following Pilot Lights shall be mounted on the inner door:
   1. Pump 1 & 2 Overtemp
   2. Pump 1 & 2 Seal Failure
   3. High Level Float
   4. Back Up Active
F. The following Selector Switches shall be mounted on the inner door:
   1. Pump 1 Hand-Off-Auto
   2. Pump 2 Hand-Off-Auto
G. The following Push Buttons shall be mounted on the inner door:
   1. Pump 1 Overtemp Reset
   2. Pump 2 Overtemp Reset
   3. Back Up Control System Reset
H. Running Timer Meters

1. An elapsed time meter shall be mounted on the inner enclosure door for each pump. It shall be 6 digit (99999.9 hours) non-reset types.
2. Unit shall have quartz accuracy. Accuracy shall be within +/- .02% over entire range.

I. Relays

1. Relays shall be provided as needed to provide the specified functionality of these specifications.
2. Relays shall be general-purpose plug-in type.
3. Each relay shall be a minimum of 4-pole with contacts rated for 6 amps at 240 VAC resistive load and 3 amps at 240 VAC inductive load.
4. Each relay shall have a built in LED indicator and illuminate when active.
5. Minimum mechanical life is 20,000,000 operations AC, 30,000,000 operations DC

J. Timers shall be 4-pole solid-state plug-in type.

1. Timers shall be provided as necessary to provide the specified functionality of these specifications.
2. Each timer shall have contacts rated for 3 amps at 220 VAC resistive load and .8 amps inductive load.
3. All relay and timer sockets shall be of the same type and shall be 14-blade. Timers shall be adjustable from 0 – 6 hours. A "time cycle in progress" and "timed out" indicating LED shall be provided.
4. Minimum mechanical life is 500,000 operations.

PUMP/MOTOR PROTECTION

All of the pump/motor unit protective and monitoring sensors shall be connected to a (Monitoring and Status) module. Each pump/motor unit shall be equipped with a supervisory system. The system shall be a two-piece product, including the base module and an operator panel.

The operator panel shall be mounted on the dead-front panel. The operator panel shall include soft-touch type navigation keypad, alarm acknowledgement keypad, amber warning lamp, red alarm lamp, and a 2-line by 20-character LCD digital display. The digital display shall provide the local readout of pump/motor sensor and alarm status, and aid in navigation through the system during set-up.

The base module shall contain a processor unit having a minimum of 2MB of memory for the logging of measurements and alarm events, two communications ports, sufficient terminals for pump/motor unit sensor connection, and a Web tool. The Web tool shall be able to be accessed in the following manners: directly connected at the site with a personal computer, remotely accessed over the owner's LAN or Internet, or by the use of a telephone modem.

System Sensors

Each pump/motor unit(s) shall be equipped with the following Base Level protection and monitoring sensors:

a. Three (3) motor winding thermal switches, one installed in each motor phase winding, and connected in series to monitor and protect the winding from over temperature operation. The thermal switches shall open, activating an alarm and stopping the motor should a high temperature event occur.
b. One (1) PT-100 temperature probe shall be installed in the motor winding to provide direct stator temperature read-out.
c. One (1) PT-100 temperature probe shall be installed to directly contact the outer race of the thrust bearing to provide for accurate temperature monitoring of the bearing.
d. One (1) Seal Leakage Sensor shall be provided to detect water intrusion into the motor stator chamber. If activated, the sensor will activate an alarm and stop the motor.
e. One (1) Leakage Sensor shall be provided to detect water intrusion into the power cable junction chamber of the pump/motor unit. If activated, the sensor will activate.

Intrinsically Safe Barriers

All float switches and transducers located in the wet well shall be provided with intrinsically safe barriers that meet UL 913 specification, 6th edition and are labeled as such. Each device shall be mounted in an intrinsically safe area that is mechanically protected from non-intrinsically safe wiring.

EXECUTION

Field Supervision

The services of a factory trained, qualified representatave shall be provided to inspect the completed installation, make all adjustments necessary to place the system in trouble-free operation, and instruct the operating personnel in the proper care and operation of the equipment.

Training

- The Supplier shall provide systems training for operations staff totalling no less than 4 hours.
- All training shall be at a location selected by the owner. All travel and per-diem expense for training will be the responsibility of the Supplier.

WARRANTY

All equipment shall be warranted against defects in material and workmanship for a period of one year from the date of Owner's final inspection and acceptance, to the effect that any defective equipment shall be repaired or replaced without cost or obligation to the Owner.