ALASKA ENERGY AUTHORITY **PROCUREMENT DEPARTMENT** **813 W Northern Lights Blvd** **Anchorage, AK 99503** **RETURN BY EMAIL** AEAProcurement@akenergyauthority.org	**REQUEST FOR QUOTATION** RFQ NO: **24084** Quotations due on/before **2:00 PM** Local Time **12/4/2023**	**Manokotak Power Plant Stabilization** Page 1 of 4 Date: 11/21/23

CONTRACTOR NOTICE (This is NOT a Purchase Order)

This is an **informal quotation** that will not be read at public opening. The information may be publicly reviewed after award. The terms and conditions should be reviewed and understood before preparing a quotation.

Fill out and sign the bottom portion of this page along with the Debarment Certificate, page 4 of Appendix B, and return both pages. Please return the quotation by the above time and date to: AEAProcurement@akenergyauthority.org. Please reference the RFQ number on the SUBJECT of the email.

PROJECT LOCATION:	**PROCUREMENT OFFICER:**
Manokotak Power Plant Manokotak, Alaska	Selwin C. Ray (907) 771-3035 sray@akenergyauthority.org

This Request for Quotation (RFQ) is for a licensed contractor to perform Work in the diesel electric power plant in Manokotak, Alaska. The Work shall consist primarily of performing mechanical repairs on existing diesel-generators, diagnosing engine problems and making recommendations for repairs, flushing and charging the glycol cooling system, along with associated tasks as described in Appendix A, Detailed Project Description, and Appendix C, Drawings.

The Engineer's Estimate for the Work is between $50,000 and $100,000.

All questions relating to bidding procedures should be directed to:
Selwin C. Ray, Contract Officer, (907) 771-3035 sray@akenergyauthority.org

All questions relating to technical aspects of the project should be directed to:
Rebecca Garrett, Project Manager, (907) 771-3042 rgarrett@akenergyauthority.org

Provide a lump sum fixed price quote in U.S. dollars where indicated below. The cost shall include all labor, materials, supervision, equipment, tools, transportation, quality control, and supplies required to complete the work as described in this RFQ.

The proposed schedule for the Work is described in Appendix A, Detailed Project Description. Provide a firm completion date where indicated below.

THIS SECTION MUST BE COMPLETED BY CONTRACTOR

Completion is desired no later than January 15, 2024.
The Work shall be substantially complete no later than _____

Lump sum price for completion of the Work _____

Company Name	Address	City	St	ZIP Code	Phone Number

Alaska Business License No.	Vendor Tax I.D.	Contractor Registration No.

_____ _____ Signature Date	_____ Typed Name and Title

INSTRUCTIONS TO BIDDERS
TERMS AND CONDITIONS

1. REQUEST FOR QUOTATION (RFQ) REVIEW: Offerors shall carefully review this RFQ for defects and questionable or objectionable material. Offerors' comments concerning defects and questionable or objectionable material in the RFQ must be made in writing and received by the purchasing authority before the date and time set for receipt of quotes. This will allow time for an amendment to be issued if one is required. It will also help prevent the opening of a defective quote, upon which award cannot be made, and the resultant exposure of offerors' prices. Offerors' original comments should be sent to the purchasing authority listed on the front of this RFQ.

2. QUOTATION FORMS: Offerors shall use this and attached forms in submitting quotes. A photocopied quote may be submitted.

3. SUBMISSION: Quotations shall be signed where applicable and received at the designated Purchasing Office no later than as indicated.

4. QUOTE REJECTION: The State reserves the right to reject any or all quotes, combinations of items, or lot(s), and to waive defects or minor informalities.

5. EXTENSION OF PRICES: In case of error in the extension of prices in the quote, the unit prices will govern; in a lot bid, the lot prices will govern. Negligence by the vendor in preparing the quotation confers no right for the withdrawal of the quotation after it has been opened.

6. ALASKA PROCUREMENT CODE: 3 AAC 109 and 2 AAC Ch. 12 are made a part of this document as if fully set forth herein. Note that 3 AAC 109 and 2 AAC Ch. 12 are available at most public libraries and legislative information offices; and both are available for review at Alaska State Purchasing Offices.

7. PRICES: The offeror shall state prices in the units of issue on this RFQ. Prices quoted for commodities must be in U.S. funds and include applicable federal duty, brokerage fees, packaging, and transportation cost to the FOB point so that upon transfer of title the commodity can be utilized without further cost. Prices quoted for services must be quoted in U.S. funds and include applicable federal duty, brokerage fee, packaging, and transportation cost so that the services can be provided without further cost. Prices quoted must be exclusive of federal, state, and local taxes. If the offeror believes that certain taxes are payable by the State, the offeror may list such taxes separately, directly below the bid price for the affected item. The State is exempt from Federal Excise Tax except the following:

- Coal - Internal Revenue Code of 1986 (IRC), Section 4121 - on the purchase of coal;
- "Gas Guzzler" - IRC, Section 4064 - on the purchase of low m.p.g. automobiles, except that police and other emergency type vehicles are not subject to the tax;
- Air Cargo - IRC, Section 4271 - on the purchase of property transportation services by air;
- Air Passenger - IRC, Section 4261 - on the purchase of passenger transportation services by air carriers;
- Leaking Underground Storage Tank Trust Fund Tax (LUST) - IRC, Section 4081 - on the purchase of Aviation gasoline, Diesel Fuel, Gasoline, and Kerosene.

8. PAYMENT FOR STATE PURCHASES: Payment for agreements under $500,000 for the undisputed purchase of goods or services provided to a State agency, will be made within 30 days of the receipt of a proper billing or the delivery of the goods or services to the location(s) specified in the agreement, whichever is later. A late payment is subject to 1.5% interest per month on the unpaid balance. Interest will not be paid if there is a dispute or if there is an agreement which establishes a lower interest rate or precludes the charging of interest.

9. PAYMENT DISCOUNT: Discounts for prompt payment will not be considered in evaluating the price you quote. However, the State shall be entitled to take advantage of any payment discount(s) offered by the vendor provided payment is made within the discount period. Payment discount periods will be computed from the date of receipt of the commodities or services and/or a correct invoice, whichever is later. Unless freight and other charges are itemized, any discount provided will be taken on full amount of invoice.

10. VENDOR TAX ID NUMBER: If goods or services procured through this RFQ are of a type that is required to be included on a Miscellaneous Tax Statement, as described in the Internal Revenue Code, a valid tax identification number must be provided to the State of Alaska before payment will be made.

11. INDEMNIFICATION: The Contractor shall indemnify, hold harmless, and defend the contracting agency from and against any claim of, or liability for error, omission or negligent act of the Contractor under this agreement. The Contractor shall not be required to indemnify the contracting agency for a claim of, or liability for, the independent negligence of the contracting agency. If there is a claim of, or liability for, the joint negligent error or omission of the Contractor and the independent negligence of the Contracting agency, the indemnification and hold harmless obligation shall be apportioned on a comparative fault basis. "Contractor" and "Contracting agency", as used within this and the following article, include the employees, agents and other contractors who are directly responsible, respectively, to each. The term "independent negligence" is negligence other than in the Contracting agency's selection, administration, monitoring, or controlling of the Contractor and in approving or accepting the Contractor's work.

12. SEVERABILITY: If any provision of this contract is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected; and the rights and obligations of the parties shall be construed and enforced as if the contract did not contain the particular provision held to be invalid.

13. TITLE: Title passes to the State for each item at FOB destination.

14. FILING A PROTEST: An offeror shall attempt to informally resolve a dispute with the procurement officer regarding a small procurement. If the attempt is unsuccessful, the vendor may protest the solicitation or the award of a small procurement contract under 3 AAC 109 and 2 AAC

Ch. 12. The protest must be filed in writing with the commissioner of the purchasing agency or the commissioner's designee and include the following information: (1) the name, address, and telephone number of the protester; (2) the signature of the protester or the protester's representative; (3) identification of the contracting agency and the solicitation or contract at issue; (4) a detailed statement of the legal and factual grounds of the protest, including copies of relevant documents; and (5) the form of relief requested. The protester must file a copy of the protest with the procurement officer for the purchasing agency. Protests will be treated in accordance with 3 AAC 109 and 2 AAC Ch. 12.

15. COMPLIANCE: In the performance of a contract that results from this RFQ, the contractor must comply with all applicable federal, state, and borough regulations, codes, and laws; and be liable for all required insurance, licenses, permits and bonds; and pay all applicable federal, state, and borough taxes.

16. SUITABLE MATERIALS, ETC.: Unless otherwise specified, all materials, supplies or equipment offered by an offeror shall be new, unused, and of the latest edition, version, model or crop and of recent manufacture.

17. SPECIFICATIONS: Unless otherwise specified in the RFQ, product brand names or model numbers are examples of the type and quality of product required, and are not statements of preference. If the specifications describing an item conflict with a brand name or model number describing the item, the specifications govern. Reference to brand name or number does not preclude an offer of a comparable or better product, if full specifications and descriptive literature are provided for the product. Failure to provide such specifications and descriptive literature may be cause for rejection of the offer.

18. FIRM OFFER: For the purpose of award, offers made in accordance with this RFQ must be good and firm for a period of ninety (90) days from the date of quote opening.

19. QUOTE PREPARATION COSTS: The State is not liable for any costs incurred by the offeror in quote preparation.

20. CONSOLIDATION OF AWARDS: Due to high administrative costs associated with processing of purchase orders, a single low quote of $50 or less may, at the discretion of the State, be awarded to the next low offeror receiving other awards for consolidation purposes. This paragraph is not subject to the protest terms enumerated in "FILING A PROTEST" above.

21. CONTRACT FUNDING: Offerors are advised that funds are available for the initial purchase and/or the first term of the contract. Payment and performance obligations for succeeding purchases and/or additional terms of the contract are subject to the availability and appropriation of funds.

22. CONFLICT OF INTEREST: An officer or employee of the State of Alaska may not seek to acquire, be a party to, or possess a financial interest in, this contract if (1) the officer or employee is an employee of the administrative unit that supervises the award of this contract; or (2) the officer or employee has the power to take or withhold official action so as to affect the award or execution of the contract.

23. ASSIGNMENT(S): Assignment of rights, duties, or payments under a contract resulting from this RFQ is not permitted unless authorized in writing by the procurement officer of the contracting agency. Quotes that are conditioned upon the State's approval of an assignment will be rejected as nonresponsive.

24. SUBCONTRACTOR(S): Within five (5) working days of notice from the state, the apparent low bidder must submit a list of the subcontractors that will be used in the performance of the contract. The list must include the name of each subcontractor and the location of the place of business for each subcontractor and evidence of each subcontractor's valid Alaska business license.

25. FORCE MAJEURE (Impossibility to perform): The parties to a contract resulting from this RFQ are not liable for the consequences of any failure to perform, or default in performing, any of its obligations under the contract, if that failure or default is caused by any unforeseeable Force Majeure, beyond the control of, and without the fault or negligence of, the respective party. For the purposes of this Agreement, Force Majeure will mean war (whether declared or not); revolution; invasion; insurrection; riot; civil commotion; sabotage; military or usurped power; lightning; explosion; fire; storm; drought; flood; earthquake; epidemic; quarantine; strikes; acts or restraints of governmental authorities affecting the project or directly or indirectly prohibiting or restricting the furnishing or use of materials or labor required; inability to secure materials, machinery, equipment or labor because of priority, allocation or other regulations of any governmental authorities.

26. LATE QUOTES: Late quotes are quotes received after the time and date set for receipt of the quotes. Late quotes will not be accepted.

27. CONTRACT EXTENSION: Unless otherwise provided in this RFQ, the State and the successful offeror/contractor agree: (1) that any holding over of the contract excluding any exercised renewal options, will be considered as a month-to-month extension, and all other terms and conditions shall remain in full force and effect and (2) to provide written notice to the other party of the intent to cancel such month-to-month extension at least thirty (30) days before the desired date of cancellation.

28. DEFAULT: In case of default by the contractor, for any reason whatsoever, the State of Alaska may procure the goods or services from another source and hold the contractor responsible for any resulting excess cost and may seek other remedies under law or equity.

29. DISPUTES: If a contractor has a claim arising in connection with a contract resulting from this RFQ that it cannot resolve with the State by mutual agreement, it shall pursue a claim, if at all, in accordance with the provisions of 3 AAC 109 and 2 AAC Ch. 12.

30. GOVERNING LAW; FORUM SELECTION: A contract resulting from this RFQ is governed by the laws of the State of Alaska. To the extent not otherwise governed by section 29 of these Standard Terms and Conditions, any claim concerning the contract shall be brought only in the Superior Court of the State of Alaska and not elsewhere.

31. CONSUMER ELECTRICAL PRODUCT: AS 45.45.910 requires that "...a person may not sell, offer to sell, or otherwise transfer in the course of the person's business a consumer electrical product that is manufactured after August 14, 1990, unless the product is clearly marked as being listed by an approved third party certification program." Electrical consumer products manufactured before August 14, 1990, must either be clearly marked as being third party certified or be marked with a warning label that complies with AS 45.45.910(e). Even exempted electrical products must be marked with the warning label. By signature on this quote the offeror certifies that the product offered is in compliance with the law. A list of approved third party certifiers, warning labels and additional information is available from: Department of Labor, Labor Standards & Safety Division, Mechanical Inspection Section, P.O. Box 107020, Anchorage, Alaska 99510-7020, (907)269-4925.

32. CONTINUING OBLIGATION OF CONTRACTOR: Notwithstanding the expiration date of a contract resulting from this RFQ, the contractor is obligated to fulfill its responsibilities until warranty, guarantee, maintenance and parts availability requirements have completely expired.

33. ORDER DOCUMENTS: Except as specifically allowed under this RFQ, an ordering agency will not sign any vendor contract. The State is not bound by a vendor contract signed by a person who is not specifically authorized to sign for the State under this RFQ. The State of Alaska Purchase Order, Contract Award and Delivery Order are the only order documents that may be used to place orders against the contract(s) resulting from this RFQ.

34. BILLING INSTRUCTIONS: Invoices must be billed to the ordering agency's address shown on the individual Purchase Order, Contract Award or Delivery Order. The ordering agency will make payment after it receives the merchandise or service and the invoice. Questions concerning payment must be addressed to the ordering agency.

35. OFFERORS WITH DISABILITIES: The State of Alaska complies with Title II of the Americans with Disabilities Act of 1990. Individuals with disabilities who may need auxiliary aids, services, and/or special modifications to participate in this procurement should contact the procurement officer named on the cover page of this RFQ as soon as possible, but no later than the date and time quotations are due to make any necessary arrangements.

36. COMPLIANCE WITH ADA: By signature of their quote the bidder certifies that they comply with the Americans with Disabilities Act of 1990 and the regulations issued thereunder by the federal government. Services or activities furnished to the general public on behalf of the State must be fully accessible. This is intended to ensure that agencies are in accordance with 28 CFR Part 35 Section 35.130 and that services, programs or activities furnished to the public through a contract do not subject qualified individuals with a disability to discrimination based on the disability.

37. FEDERAL ASSURANCES: Because this contract is funded with federal funds, the provisions of Appendix B, Federal Assurances, shall apply. When submitting the quote, the vendor shall include the Debarment Certificate, page 4 of Appendix B.

38. INSPECTIONS AND REPORTS: The Authority may inspect, in the manner and at reasonable times it considers appropriate, all of the contractor's facilities and activities under this contract. The contractor shall make progress and other reports in the manner and at the times the Authority reasonably requires.

39. NO ADDITIONAL WORK OR MATERIAL: No claim for additional supplies or services, not specifically provided in this contract, performed or furnished by the contractor, will be allowed, nor may the contractor do any work or furnish any material not covered by the contract unless the work or material is ordered in writing by the Contracting Officer.

40. CONFLICTING PROVISIONS: Unless specifically amended and approved by the Department of Law, the terms of this contract supersede any provisions the contractor may seek to add. The contractor may not add additional or different terms to this contract; AS 45.02.207(b)(1). The contractor specifically acknowledges and agrees that, among other things, provisions in any documents it sees to append hereto that purport to (1) waive the State of Alaska's sovereign immunity, (2) impose indemnification obligations on the Authority, or (3) seek to limit liability of the contractor for acts of contractor negligence, are expressly superseded by this contract and are void.

I. Background:

Manokotak Power Company (MPC) operates a diesel power plant that provides prime power to the community of Manokotak, Alaska. MPC is a wholly owned subsidiary of Manokotak Natives Limited (MNL), which is the village ANCSA corporation.

In 2018 the power plant MPC installed two new 300kW Caterpillar C9.3 marine Tier 3 gensets (Gen#1 and Gen#2). After around 3 years of use and with approximately 12,000-15,000 hours of run time each, the two Caterpillar C9.3's became extremely unreliable, suffered from decreased power, and were no longer able to carry the community load.

In 2021 MPC installed a low hour, used, mechanically governed 400kW Caterpillar 3406DI (Gen#3) was installed in the plant to provide prime power. In early 2023, after approximately 2 years of use and with approximately 16,000 hours of run time, Gen#3 seized up after a major oil cooler failure. The oil cooler failure also heavily fouled the entire engine cooling system. The entire Gen#3 skid has since been removed from the power plant. The cooling system has not yet been properly cleaned & flushed to remove the oil contamination.

After the failure of the Gen#3, a standalone 475kW Caterpillar 3456 emergency standby unit (Egen) was installed in a connex next to the power plant to provide community prime power generation. In November of 2023, a mechanic performed limited repair work on Gen#1 (C9.3). At this time Gen #1 and the Egen are currently the only operable genset capable of providing prime power.

The utility has recently purchased a military surplus mechanically governed 260kW standby rated Caterpillar 3406DI genset. This unit has been moved into the power plant in the Gen#3 position but has not yet been fully installed. The unit is undersized and is not capable of providing prime power generation for the community during the winter.

A major power plant upgrade project is scheduled for summer 2025 that will include all new gensets, switchgear and cooling system. The purpose of the 2023 stabilization project is to flush the cooling system and perform diagnostics to allow repair at least one gensets so the plant can provide prime power for the entire community until the start of construction in the summer of 2025. After the stabilization project, the Egen will be relegated to emergency standby service only so that it can be used to power the community during power plant demolition and reconstruction in 2025.

II. Project Schedule:

December 4, 2023	Bids due.
December 6, 2023	Notice of Contract Award.
January 15, 2024	Substantial Completion. Note that this is the desired completion date. Provide a firm completion date in the Bid Response based on the above listed schedule.

III. Scope of Work:

Drawings are included in Appendix B and are hereby incorporated into this RFQ. The drawings consist of two sheets, STM1 and STM2, which depict the Work for this project.

A preliminary investigation was performed at this power plant in October 2023. The trip report is included in Appendix C for reference.

The intent of the Contract is to provide for the completion of every detail of work described in the RFQ. The Contractor shall furnish all labor, materials, supervision, equipment, tools, transportation, quality control, and supplies required to complete the work in accordance with the RFQ. The Work shall include but not be limited to the following tasks:

1) Prior to beginning construction, provide a schedule to AEA. The schedule shall include the estimated date for substantial completion so that AEA can schedule staff travel for inspection, testing, and commissioning.
2) Provide daily progress reports to AEA via email. Reports shall include a brief summary of work completed along with representative photos.
3) Furnish all required materials and hardware.
4) Mobilize all required materials, equipment, tools, supplies, etc. and all required personnel to the project site in Manokotak, Alaska.
5) Maintain power in the community during construction with limited outages scheduled in advance with the local utility. Note that the existing exterior standalone emergency standby generator (Egen) is connected into the power plant switchgear bus without paralleling capability. Outages will be required for Egen periodic servicing and to switch between the Egen and Gen #1 in the power plant.
6) Note that the power plant has station service electricity but no heat source when the Egen is powering the community. Furnish space heaters and fuel as required to perform work in unheated space if required.
7) Furnish materials and perform the engine cooling system clean, flush, and glycol replacement as indicated on Sheet STM2, Appendix B using the Gen #1 Cat C9.3 to provide coolant circulation and heat. Note that If Gen #1 is used to provide power to the community multiple outages will be required so it may be best to have the operators place the community on Egen power during flushing.
8) While the coolant flush is underway perform diagnostics on the Cat C9.3 engine on Gen#2. Diagnostics shall include at a minimum:
    a) Connect computer and run Cat ET Cat ET diagnostics to determine deficiencies.
    b) Borescope the cylinders.
    c) Remove oil pan and inspect all rod and crankshaft main journals.
    d) Based on top end borescope and bottom end journal inspections, decide if the other engine is a viable candidate for a major overhaul and write up findings.
9) While the coolant flush is underway perform diagnostics on the seized 400kW Cat 3406 (old Gen#3) engine as follows:
    a) Borescope the cylinders.
    b) Remove oil pan and inspect all rod and crankshaft main journals.
    c) Determine cause of engine seizure
    d) Inspect oil cooler for proper installation and leaks.
    e) Based on top end borescope, journal inspections, and seizure/oil cooler

investigation, decide if the non-running Cat 3406 is a candidate for a major overhaul and write up findings.

10) While the coolant flush is underway, examine the 260kW Cat 3406 (in position #3) installation to determine what is needed for completion and write up findings.
11) After the completion of the coolant flush, have the plant operators take an outage to transfer power generation from the Egen to Gen #1.
12) Perform service and repairs on Egen as follows:
    a) Replace fan guards.
    b) Replace cover over main breaker and bus.
    c) Inspect coolant and replace with new ELC to match power plant if required.
    d) Drain and replace engine oil and filters.
    e) Install Murphy L129CK1 low oil shut off switch and connect to generator control panel as required. Mark run level, low oil level, and high oil level on site tube.
13) Provide written report to AEA summarizing repairs made, present plant operating status, and findings from previous steps of additional future engine repair work required to C9.3 and 400kW 3406.

IV. Owner Furnished Tools and Services:

Under Part V the term Owner refers to Manokotak Power Company (MPC).

1) The Owner will provide light and electrical power inside the power plant at no cost to the Contractor.
2) The Owner will provide use of local equipment for lifting and moving the generators at no cost to the Contractor.
3) The Owner will provide access to potable water at the Village Public Safety building located approximately 300’ south of the power plant along First Avenue.
4) The Owner will provide housing with cooking facilities. Food will not be provided.
5) The Owner will provide one local operator to assist with the work if required.

V. Contractor Qualifications:

In order to be considered responsible the bidder must meet the following qualifications. After receipt of quotes the Authority may request information demonstrating contractor qualifications such as staff resumes, client references, etc.

1) The Contractor shall have a current Alaska business license and shall be regularly involved in the installation, service, and repair of diesel generation equipment.
2) The Contractor shall employ experienced diesel technicians and shall send to the project site a minimum of one journeyman level diesel mechanic to perform the work.
3) The Contractor shall have a current copy of Caterpillar diagnostics software (Cat ET) and the mechanic being sent to the site shall have experience running Cat ET and interpreting results.

VI. Special Terms and Conditions:

1) There are no Federal funds being used in this work; therefore, this work is not subject to Federal prevailing wage requirements.

2) Manokotak Natives Limited d.b.a. Manokotak Power Company is not a political subdivision of the State of Alaska; therefore, this work is not subject to AS 36.05. Alaska Mini-Davis-Bacon wage rates do not apply and certified payroll is not required.

3) Specific insurance requirements are included under Part VII, Insurance. The Contractor shall provide Insurance in accordance with these requirements. Note that failure to supply satisfactory proof of insurance within the time required may cause Owner to declare the bidder non-responsible and to reject the bid.

VII. Insurance Requirements:

The Contractor shall purchase at their own expense and maintain in force at all times during the performance of services under this agreement the following policies of insurance. Where specific limits are shown, it is understood that they shall be the minimum acceptable limits. If the Contractor's policy contains higher limits, the Owner shall be entitled to coverage to the extent of such higher limits. Certificates of Insurance must be furnished to the Owner prior to beginning work and must provide for a notice of cancellation, non-renewal, or material change of conditions in accordance with policy provisions. Failure to furnish satisfactory evidence of insurance or lapse of the policy is a material breach of this contract and shall be grounds for termination of the Contractor's services. All insurance policies shall comply with, and be issued by insurers licensed to transact the business of insurance under AS 21. Proof of insurance is required for the following:

Workers' Compensation Insurance: The Contractor shall provide and maintain, for all employees engaged in work under this contract, coverage as required by AS 23.30.045, and; where applicable, any other statutory obligations including but not limited to Federal U.S.L. & H. and Jones Act requirements. The policy must waive subrogation against Owner.

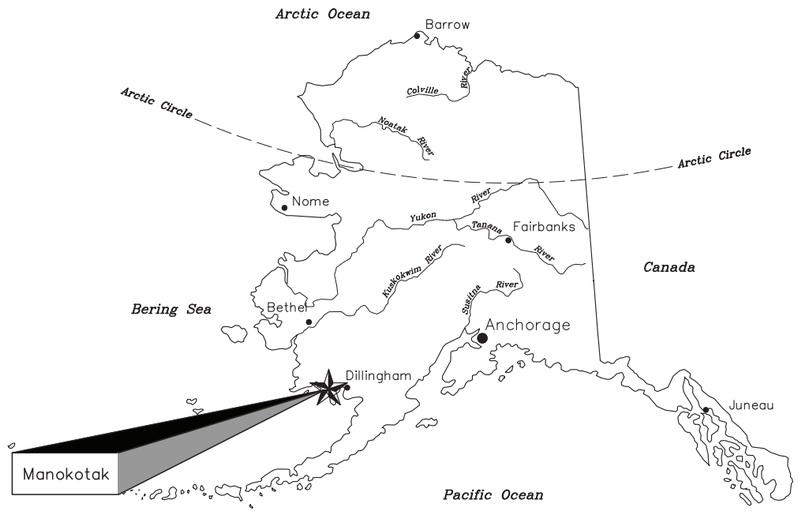
Commercial General Liability Insurance: covering all business premises and operations used by the Contractor in the performance of services under this agreement with minimum coverage limits of $1,000,000 combined single limit per occurrence. The Owner shall be listed as additional insured and a Waiver of Subrogation against the Owner will be provided.

Commercial Automobile Liability Insurance: covering all vehicles used by the Contractor in the performance of services under this agreement with minimum coverage limits of $300,000 combined single limit per occurrence.

Failure to supply satisfactory proof of insurance within the time required may cause Owner to declare the bidder non-responsible and to reject the bid.

The Certificate of Insurance shall name Manokotak Power Company and the Alaska Energy Authority as certificate holders and reference the project title “Manokotak Power Plant Stabilization”.

1 STM1 POWER PANT AREA PLAN
AS INDICATED ON GRAPHIC SCALE



MANOKOTAK POWER PLANT STABILIZATION PROJECT NOVEMBER 2023

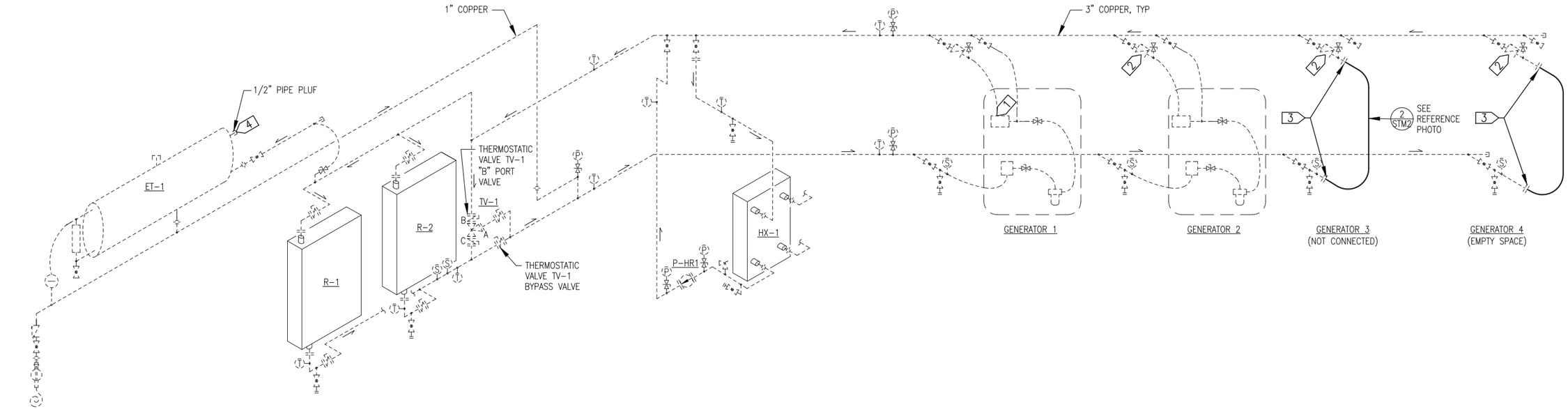
ALASKA ENERGY AUTHORITY

PROJECT: MANOKOTAK 2023 POWER PLANT STABILIZATION

TITLE: MANOKOTAK POWER PLANT VICINITY & AREA PLANS

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 11/17/23
FILE NAME: MANO PP STAB	SHEET: STM1
PROJECT NUMBER:	



1 STM2 COOLING SYSTEM PIPING ISOMETRIC
NO SCALE

ENGINE COOLING SYSTEM CLEAN, FLUSH, & GLYCOL REPLACEMENT INSTRUCTIONS

ENGINE COOLING SYSTEM GLYCOL REPLACEMENT GENERAL NOTES:

1) ENGINE COOLANT SYSTEM VOLUME IS APPROXIMATELY 120 GALLONS. PROVIDE A MINIMUM OF 5 EACH EMPTY 55 GALLON DRUMS TO CONTAIN CONTAMINATED COOLANT AND CLEANING SOLUTION. NOTE: THE LIQUID AFTERCOOLER CIRCUIT IS NOT FOULED AND IS NOT INCLUDED ON THIS SCOPE OF WORK.
2) FURNISH 3 EACH 55 GALLON DRUMS OF NEW EXTENDED LIFE ETHYLENE GLYCOL SOLUTION PRE-MIXED TO A RATIO OF 50% GLYCOL TO 50% WATER.
3) COMMUNITY OUTAGES SHOULD BE REQUIRED DURING DRAIN/CLEAN/FLUSH OPERATION IF ALL WORK CAN OCCUR WITH COMMUNITY POWERED BY THE EXISTING EGEN. COORDINATE WITH LOCAL POWER PLANT OPERATORS.
4) WHEN DRAINING FLUID AS NOTED BELOW, DRAIN FROM ALL LOW POINTS AND USE LOW PRESSURE AIR AS REQUIRED TO CLEAR ISOLATED SECTIONS.
5) THE FLUSH WILL NEED TO BE PERFORMED USING GEN#1 BECAUSE IT IS THE ONLY RUNNING ENGINE IN THE POWER PLANT.

STEP 1: ENGINE COOLING SYSTEM PREP AND DRAIN

A. REMOVE GEN#1 AND GEN#2 THERMOSTATS TO ENSURE FULL FLOW IN PIPING FROM RUNNING ENGINE WATER PUMP AND TO ALLOW BACK FLOW THROUGH ENGINE BLOCK THAT IS NOT RUNNING. SEE SPECIFIC NOTE #1.
B. REMOVE CHECK VALVE FLAPPER OR INSERT WEDGE IN GENERATOR BRANCH DISCHARGE CONNECTION CHECK VALVES TO ALLOW BACK FLOW. SEE SPECIFIC NOTE #2.
C. NEW 260KW GEN#3 IS NOT YET CONNECTED TO COOLING SYSTEM. INSTALL TEMPORARY HOSE BYPASS TO ALLOW LIMITED CIRCULATION THROUGH ENGINE BRANCH CONNECTION FITTINGS. SEE SPECIFIC NOTE #3.
D. CREATE TEMPORARY BYPASS AT GEN #4 (UNUSED) CONNECTION TO ALLOW FULL CIRCULATION THROUGH MAINS AT END. SEE SPECIFIC NOTE #3.
E. INSTALL HOSE FOR EXPANSION TANK FLUSH. SEE SPECIFIC NOTE #4.
F. OPEN BYPASS VALVE AT TV-1.
G. START GEN #1 AND TURN ON PUMP P-HR1 TO CIRCULATE THROUGH THE HEAT EXCHANGER. RUN ENGINE LONG ENOUGH TO WARM UP ENTIRE COOLING SYSTEM TO 100F MINIMUM AND VERIFY CIRCULATION THROUGH ALL ENGINES AND PIPING BRANCHES.
H. SHUT DOWN GEN #1 AND TURN OFF PUMP P-HR1. DRAIN THE EXISTING CONTAMINATED COOLANT FROM THE SYSTEM WITHIN 1/2 HOUR OF ENGINE SHUT DOWN TO AVOID SETTLING OUT SOLIDS. DRAIN INTO DRUMS AND TURN OVER TO UTILITY.

STEP 2: ENGINE COOLING SYSTEM DETERGENT FLUSH

I. FILL SYSTEM WITH FRESH WATER AND HEAVY DUTY ALKYLINE-BASED ENGINE CLEANING SOLUTION, CUMMINS FLEETGUARD RESTORE, OR EQUAL, 1 GALLON PER 10 GALLONS OF FRESH WATER.
J. START GEN #1 AND TURN ON PUMP P-HR1. BRING SYSTEM UP TO OPERATING TEMPERATURE AND OPERATE FOR 24 HOURS MINIMUM.
K. AFTER SYSTEM IS FULLY UP TO TEMPERATURE, CLOSE VALVE AT THERMOSTATIC VALVE TV-1 "B" PORT TO ENSURE FULL FLOW THROUGH THE RADIATORS.
L. CLOSE ISOLATION VALVES ON RADIATOR R-2 AND PUMP THROUGH R-1 ONLY FOR THE FIRST 12 HOURS OF DETERGENT CIRCUATION. CLEAN AND DEGREASE RADIATOR R-2 AIR SURFACES USING PRESSURE WASHER TO REMOVE ALL DEBRIS.
M. OPEN ISOLATION VALVES ON RADIATOR R-2 AND CLOSE ISOLATION VALVES ON RADIATOR R-1 TO CIRCULATE THROUGH R-2 ONLY FOR THE NEXT 12 HOURS OF DETERGENT CIRCULATION. CLEAN AND DEGREASE RADIATOR R-1 AIR SURFACES USING PRESSURE WASHER TO REMOVE ALL DEBRIS.
N. NOTE ANY DIFFERENCES OR CHANGES IN PRESSURE WHEN SWITCHING BETWEEN RADIATORS TO INDICATE POTENTIAL FLOW RESTRICTIONS.
O. OPEN ISOLATION VALVES ON BOTH RADIATORS AND RUN FOR 15 MINUTES MINIMUM, THEN OPEN VALVE AT THERMOSTATIC VALVE TV-1 "B" PORT AND RUN FOR 15 MINUTES MINIMUM.
P. SHUT DOWN GEN #1 AND TURN OFF PUMP P-HR1. DRAIN THE USED CLEANING SOLUTION FROM THE SYSTEM WITHIN 1/2 HOUR OF ENGINE SHUT DOWN TO AVOID SETTLING OUT SOLIDS. DRAIN INTO DRUMS AND TURN OVER TO UTILITY.

STEP 3: ENGINE COOLING SYSTEM WATER FLUSH

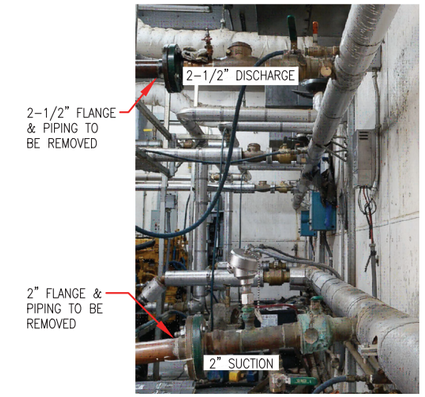
Q. FILL SYSTEM WITH FRESH WATER.
R. START GEN #1 AND TURN ON PUMP P-HR1. BRING SYSTEM UP TO OPERATING TEMPERATURE AND OPERATE FOR 2 HOURS MINIMUM. CAREFULLY INSPECT THE ENTIRE SYSTEM FOR ANY LEAKS WHILE FLUSHING. IF ANY LEAKS ARE DETECTED, SHUT OFF RUNNING GENERATOR, REPAIR AS REQUIRED, AND BEGIN THIS STEP OVER.
S. SHUT DOWN GEN #1 AND TURN OFF PUMP P-HR1. DRAIN THE WATER. INSPECT THE DRAINED WATER FOR SIGNS OF OIL, CONTAMINATE OR DIRT. IF RINSE WATER IS CONTAMINATED REPEAT THE FRESH WATER RINSE. IF THE WATER IS CLEAN, PROCEED TO STEP 4.

STEP 4: ENGINE COOLING SYSTEM FILL/COMMISSION

T. REMOVE EXPANSION TANK PRESSURE CAP AND SITE GAUGE, CLEAN, AND REINSTALL. REMOVE HOSE AND REINSTALL PLUG.
U. REINSTALL CHECK VALVE FLAPPERS OR REMOVE WEDGES FROM CHECK VALVES. CLOSE BUTTERFLY VALVES. REMOVE TEMPORARY BYPASS HOSES.
V. REINSTALL THERMOSTAT ON GEN#1 WITH NEW GASKETS.
W. FILL SYSTEM WITH NEW 50% EXTENDED LIFE ETHYLENE GLYCOL SOLUTION.
X. START GEN #1 AND TURN ON PUMP P-HR1. BRING SYSTEM UP TO OPERATING TEMPERATURE. OPERATE FOR AN ADDITIONAL 2 HOURS MINIMUM. PURGE ALL AIR FROM SYSTEM AND INSPECT THE ENTIRE SYSTEM FOR ANY LEAKS. ENSURE THAT COOLANT LEVEL IS APPROXIMATELY 2/3 UP ON EXPANSION TANK SITE GAUGE AT CONCLUSION OF TEST.

COOLING SYSTEM CLEAN, FLUSH, & GLYCOL REPLACEMENT SPECIFIC NOTES:

1. REMOVE EXISTING GEN#1 (GEN#2) ENGINE THERMOSTAT FOR FLUSHING AND REINSTALL WITH NEW GASKET WHEN COMPLETE. EXISTING ENGINE IS A TIER 3 CATERPILLAR C9.3, SERIAL CG900111 (CG900112).
2. ON ENGINE NOT BEING RUN TEMPORARILY REMOVE OR WEDGE OPEN THE CHECK VALVE FLAPPER IN DISCHARGE CONNECTION. IF WEDGING, CUT WEDGE FROM METAL PLATE WITH SHAPE AND SIZE AS REQUIRED TO FIT INSIDE VALVE HOUSING. AFTER FINAL FLUSH AND DRAIN REINSTALL CHECK VALVE FLAPPER OR REMOVE CHECK VALVE WEDGE.
3. CREATE TEMPORARY BYPASS AT GEN#3 AND GEN#4 POSITIIONS TO ALLOW CIRCULATION FOR FLUSHING BRANCH ENGINE CONNECTION FITTINGS AND VALVES. REMOVE EXISTING PIPING BEYOND FLANGES AS INDICATED ON REFERENCE PHOTO. INSTALL 2-1/2" (DISCHARGE) AND 2" (SUCTION) THREADED FLANGES. INSTALL HEX BUSHINGS TO REDUCE CONNECTION TO 3/4" FPT. INSTALL 3/4" MPTxHOSE END ADAPTERS AND SECTION OF WASHING MACHINE HOSE TO CREATE BYPASS. REMOVE VENT HOSE AND CLOSE 1/2" VALVE. AFTER FINAL FLUSH, CLOSE BUTTERFLY VALVES AND REMOVE TEMPORARY HOSE.
4. REMOVE 1/2" PIPE PLUG WHERE INDICATED ON ISOMETRIC AND ATTACH HOSE TO BUCKET ON FLOOR. PERIODICALLY ADD WATER TO ALLOW HOT DETERGENT SOLUTION AND FRESH WATER RINSE TO FLOW THROUGH TANK AND INTO BUCKET. AFTER FLUSHING, REMOVE HOSE AND REPLACE PLUG.



2 STM2 GEN#3 PIPING REFERENCE PHOTO
NO SCALE

ALASKA ENERGY AUTHORITY

PROJECT: MANOKOTAK 2023 POWER PLANT STABILIZATION

TITLE: ENGINE COOLING SYSTEM CLEAN/FLUSH/FILL

Gray Stassel Engineering, Inc.
P.O. 111405, Anchorage, AK 99511 (907)349-0100

DRAWN BY: JTD	SCALE: AS NOTED
DESIGNED BY: BCG	DATE: 11/17/23
FILE NAME: MANO PP STAB	SHEET: STM2
PROJECT NUMBER:	

High Standard LLC
1110 West 6th Ave Suite 202
Anchorage, Alaska 99501
jcravens@highstandard.tech
(907) 952-4446

Inspection of Manokatak Power Plant

Generator #1

Engine
MFG: Caterpillar
Model: C9.3
Serial: CAT00C93LC9300112
Family: GCPXN09.3EE3
Hours: 15,647

Generator
Prime
Order Reference: MYWWK
KW: 375

Cooling System:
The engines coolant outlet hose that leads to the engine's thermostat housing failed. An attempt to repair has been made by adjoining two hoses clamped together to make a temporary repair. The floor has coolant on it from the last coolant leak. The operator Terence informed me that they switched from the Caterpillar extended life coolant ELC to ethylene glycol green name Terex, the solution mixture between coolant and water is unknown. Terence informed me that the engine starts to overheat at loads above 200KW due to external radiator contamination not allowing proper air flow across the radiator core. At loads above 200KW the engine eventually overheats and shuts down. A previous oil cooler failure of generator #3 has contaminated the combined cooling system for all engines. Terence sail that the system was flushed after. Operators were cleaning the outside of the radiator during my visit.

Fuel System:
Performed fuel rail pump solenoid test on both solenoids. Results OK.
Performed injector solenoid test. Results calibration failure.
Performed injector cylinder cutout. Results cylinder #1 not responding properly.

Exhaust System:
Leaks exhaust at flange located under the DPF's. Recorded exhaust back pressure in past my have contributed to the failure.

Electrical:
Engines P1 ECM (ADEM) connector hex retaining screw has been over tightened by use of a torx bit by the operators own admission leading to stripping the head out.

Mechanical Engine:
The engine runs unstable at rated speed +/- 1.3 HZ, most likely due to mechanical issues.
Recommended oil change interval for this is every 250 hours, currently the oil is being changed at 500-hour intervals. Changing oil beyond the 250 hours would have to follow the extended oil change protocol.

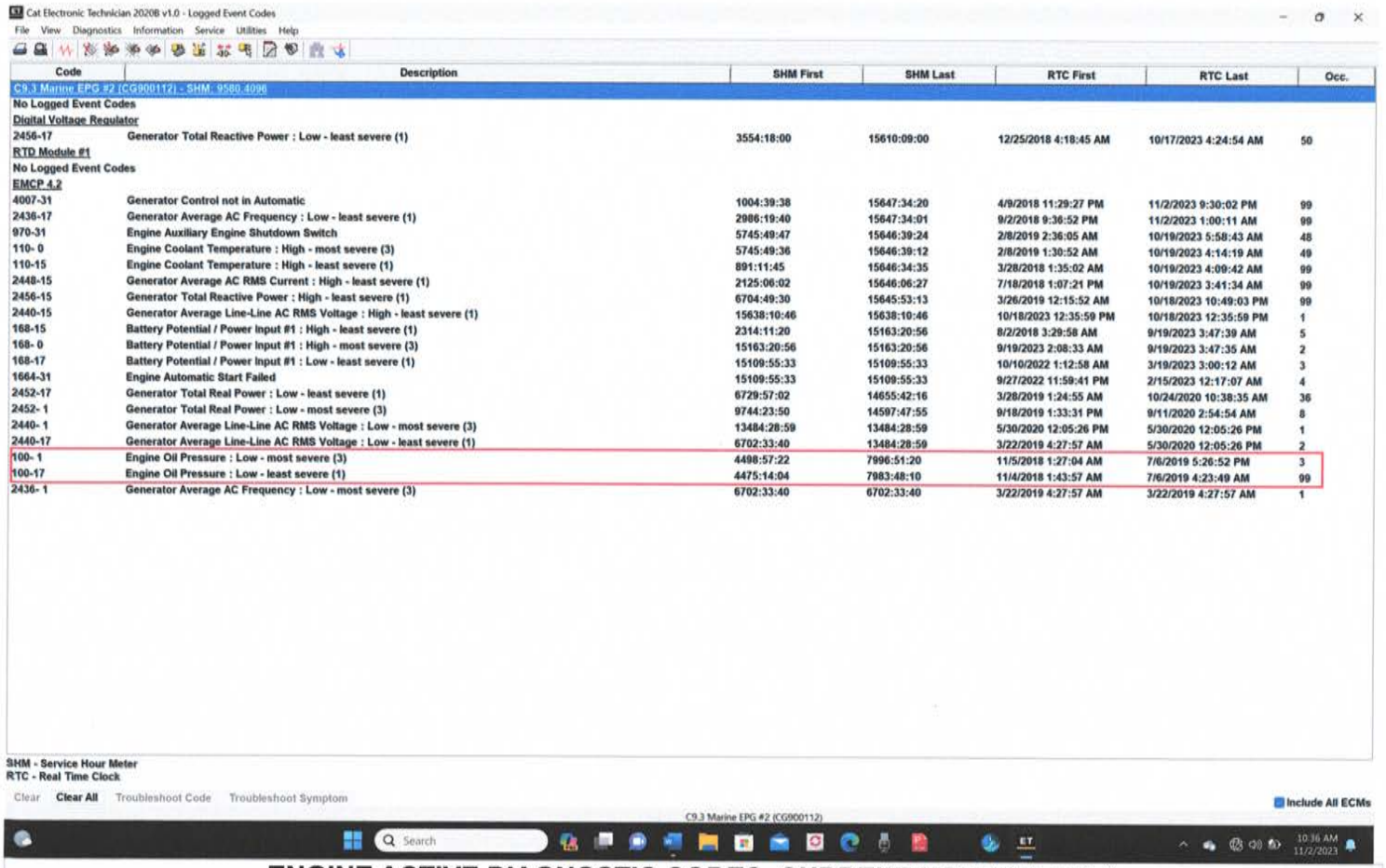
Continued

The EMCP control panel indicates 15,647 engine hours Caterpillars recommendations for a top end overhaul is 12,000 hours. In addition, I suspect the engine hasn't had its routine recommended maintenance such as tune-ups during it lifetime.

Notes:
a) This ECM (ADEM) was removed from generator #2 and installed on generator #1 at unknown hours by the operators. It suspected that the ADEM was defective.
b) The low oil pressure alarms count 99 and the low oil pressure shutdowns count 3 were most likely caused from running low on oil and an out of oil condition. The severity of this condition has most likely caused internal engine damage.
c) ADEM only registers 99 total events. As indicated the low oil pressure alarms have exceeded this value.
d) No service records have been kept by operations.

Generator:
No recommendations found.

Dynamic Testing Under Load: The load was switched from the containerized generator outside to an open transition to
Generator #1 the assuming load was 180 KW. Once assuming load, the generator dropped to 51 HZ and Shutdown on under frequency. Notably due to the engines poor performance before assuming load.


Cat Electronic Technician 2020B v1.0 - Logged Event Codes

File View Diagnostics Information Service Utilities Help

Code	Description	SHM First	SHM Last	RTC First	RTC Last	Occ.
C9.3 Marine EPG #2 (CG900112) - SHM: 9580.4096						
No Logged Event Codes						
Digital Voltage Regulator						
2456-17	Generator Total Reactive Power : Low - least severe (1)	3554:18:00	15610:09:00	12/25/2018 4:18:45 AM	10/17/2023 4:24:54 AM	50
RTD Module #1						
No Logged Event Codes						
EMCP 4.2						
4007-31	Generator Control not in Automatic	1004:39:38	15647:34:20	4/9/2018 11:29:27 PM	11/2/2023 9:30:02 PM	99
2436-17	Generator Average AC Frequency : Low - least severe (1)	2986:19:40	15647:34:01	9/2/2018 9:36:52 PM	11/2/2023 1:00:11 AM	99
970-31	Engine Auxiliary Engine Shutdown Switch	5745:49:47	15646:39:24	2/8/2019 2:36:05 AM	10/19/2023 5:58:43 AM	48
110- 0	Engine Coolant Temperature : High - most severe (3)	5745:49:36	15646:39:12	2/8/2019 1:30:52 AM	10/19/2023 4:14:19 AM	49
110-15	Engine Coolant Temperature : High - least severe (1)	891:11:45	15646:34:35	3/28/2018 1:35:02 AM	10/19/2023 4:09:42 AM	99
2448-15	Generator Average AC RMS Current : High - least severe (1)	2125:06:02	15646:06:27	7/18/2018 1:07:21 PM	10/19/2023 3:41:34 AM	99
2456-15	Generator Total Reactive Power : High - least severe (1)	6704:49:30	15645:53:13	3/26/2019 12:15:52 AM	10/18/2023 10:49:03 PM	99
2440-15	Generator Average Line-Line AC RMS Voltage : High - least severe (1)	15638:10:46	15638:10:46	10/18/2023 12:35:59 PM	10/18/2023 12:35:59 PM	1
168-15	Battery Potential / Power Input #1 : High - least severe (1)	2314:11:20	15163:20:56	8/2/2018 3:29:58 AM	9/19/2023 3:47:39 AM	5
168- 0	Battery Potential / Power Input #1 : High - most severe (3)	15163:20:56	15163:20:56	9/19/2023 2:08:33 AM	9/19/2023 3:47:35 AM	2
168-17	Battery Potential / Power Input #1 : Low - least severe (1)	15109:55:33	15109:55:33	10/10/2022 1:12:58 AM	3/19/2023 3:00:12 AM	3
1664-31	Engine Automatic Start Failed	15109:55:33	15109:55:33	9/27/2022 11:59:41 PM	2/15/2023 12:17:07 AM	4
2452-17	Generator Total Real Power : Low - least severe (1)	6729:57:02	14655:42:16	3/28/2019 1:24:55 AM	10/24/2020 10:38:35 AM	36
2452- 1	Generator Total Real Power : Low - most severe (3)	9744:23:50	14597:47:55	9/18/2019 1:33:31 PM	9/11/2020 2:54:54 AM	8
2440- 1	Generator Average Line-Line AC RMS Voltage : Low - most severe (3)	13484:28:59	13484:28:59	5/30/2020 12:05:26 PM	5/30/2020 12:05:26 PM	1
2440-17	Generator Average Line-Line AC RMS Voltage : Low - least severe (1)	6702:33:40	13484:28:59	3/22/2019 4:27:57 AM	5/30/2020 12:05:26 PM	2
100- 1	Engine Oil Pressure : Low - most severe (3)	4498:57:22	7996:51:20	11/5/2018 1:27:04 AM	7/6/2019 5:26:52 PM	3
100-17	Engine Oil Pressure : Low - least severe (1)	4475:14:04	7983:48:10	11/4/2018 1:43:57 AM	7/6/2019 4:23:49 AM	99
2436- 1	Generator Average AC Frequency : Low - most severe (3)	6702:33:40	6702:33:40	3/22/2019 4:27:57 AM	3/22/2019 4:27:57 AM	1

SHM - Service Hour Meter
RTC - Real Time Clock

Clear Clear All Troubleshoot Code Troubleshoot Symptom

Include All ECMs

C9.3 Marine EPG #2 (CG900112)

Search

10:36 AM 11/2/2023

ENGINE ACTIVE DIAGNOSTIC CODES, CURRENT HOURS 9,579.0

CODE: 651	DESCRIPTION: ENGINE INJECTOR CYLINDER #1 NOT RESPONDING PROPERLY	EVENT FAULT HOURS: 9,579	OCC 1

Generator #2
Engine
MFG: Caterpillar
Model: C9.3
Serial: CAT00C93LC9300113
Family:
Hours: 11,558

Generator
Prime
Order Reference: MYWWJ
KW: 375

Cooling System:
Many leaks' indications from engine. The engines outlet coolant hose that leads to the engine's thermostat has a hose clamp missing and the coolant has been valved off to this engine.

Fuel System:
The P1 solenoid on the HP (HEUI) fuel pump has had its plunger removed for reasons unknown. The plunger cover has been left off leading to contamination the HP pump.

Exhaust System:
No recommendations

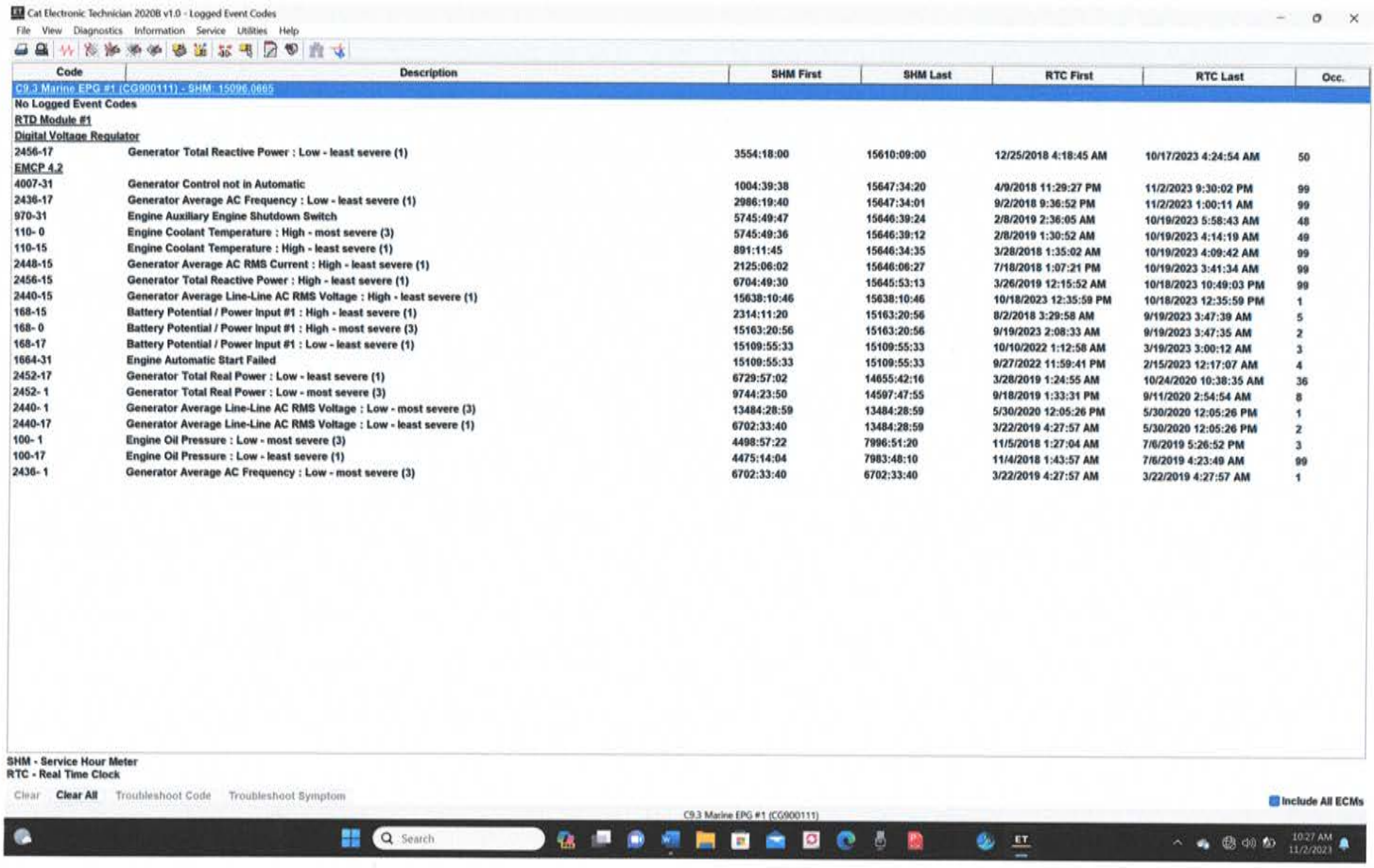
Electrical:
No recommendations

Mechanical Engine.
This engine has been placed out of commission due to mechanical issues.
The engine shows many signs of coolant and oil leaks.
The engine has many of the same issues that were found in generator #1

Generator:
No recommendations

Dynamic Testing:
Unable to start and run the engine due to the HP pump being taken apart.

Continued



GENERATOR 2 EMCP LOGGED EVENTS, CURRENT HOURS 11,558.0	
GENERATOR REVERSE REACTIVE WARNING	OCC 99
GENERATOR OVER CURRENT WARNINGS	OCC 99
GENERATOR REVERSE VARS SHUTDOWN	OCC 85
DIGITAL OUTPUT #1 SHORT CIRCUIT	OCC 66
HIGH ENGINE COOLANT TEMPERATURE WARNING	OCC 99
HIGH ENGINE COOLANT TEMPERATURE SHUTDOWNS	OCC 41
GENERATOR UNDER FREQUENCY WARNINGS	OCC 99
LOW ENGINE OIL PRESSURE WARNING	OCC 99
LOW OIL PRESSURE SHUTDOWNS	OCC 2

Generator Outside in Container
Engine
MFG: Caterpillar
Model: 3456
Serial: 7WG00663
Performance Spec: 0K-2761
Package: CAT00000TCCB00599
Hours: 6,455

Cooling System:
The fan guards have been removed and are sitting outside. This is a major safety hazard and should be addressed immediately.

Fuel System:
An additional fuel water separator has been added to the fuel supply hanging off of the wall of the container that is improperly supported.

Exhaust System:
The exhaust flex has improperly installed with a 11 inch deviation between the outlet of the engines flange to the thimble flange. Flex will most likely crack within time.

Electrical:
The generators circuit breaker has been left off exposing the live buss. This is a major safety hazard and should be addressed immediately.
This engine was not provided with a 9-pin service connector for communication with Caterpillars electronic technician software ET. No communication could be established with the engine therefore I was unable to download a product status report.

Mechanical Engine:
No coolant or oil leaks detected. The engine is probably due for a tune-up.

Generator:
No recommendations

Dynamic Testing:
The generator was running as a primary unit as no other generators were available at the time of my visit. The operator noted that the oil consumption was approximately 1 gallon per week which would be considered normal. Note: The oil is only being changed once a month exceeding the 250 hour service interval.

Generator in Warehouse

Engine
MFG: Caterpillar
Model: 3406
Serial: 90U15470
AR: 1W0738
Hours: 1,267

Generator:
Standby
KW: 260

Cooling System:
Supplied without radiator.

Fuel System:
Factory supply and return fittings.

Exhaust System:
Factory supplied exhaust outlet flange.

Electrical:
Doghouse electrical distribution enclosure mounted on right side of generator. Control panel is missing one 11-pin octal time delay relay used for low oil pressure shutdown. Note: This engine requires an external speed control to control the EG3P Woodward governor, not supplied.

Mechanical Engine:
Engine has low hours and appears to be in good shape. Suspect the pre combustion PC seals will need to be renewed as they could leak from sitting so long as well as the water pump.

Generator:
No comments.

Dynamic Testing:
N/A

Power Plant Summary

Generator #1 & #2
Both generators would be a good candidate for putting back in commission. However, based upon historical records of multiple low oil pressure warning and shutdowns, high JW temperature warnings and shutdowns and extended oil change intervals that may have contributed to excessive internal engine wear.
Both engines are beyond there recommend overhaul period.

Recommendations:

Option 1: Replace all 6 injectors, HEUI and water pump and recommended sensors, seals and gaskets. Flush cooling system. Reinstall ADEM back on engine #2

Option 2: Borescope all cylinders and inspect crankshaft for wear. After the engines have been deemed as a candidate for rebuilding, we would have a better understanding of overhaul parts to order for both of one of the engines.

Option 3: Same as option 1 except for rebuilding only one of the select engines.

Outside Containerized Generator
Recommend a tune-up of the engine and installing a 9-pin service connector for evaluating historical logged events. Meet recommended safety requirements as aforementioned.

Warehoused 3406 Generator
This generator package would be a good candidate to replace the existing failed generator in the power plant for generator #3 Although its stand-by 260KW rating is undersized for the loads expected in winter conditions it could fit in with lessened loads within the village.
Recommendations: Remove existing #3 generator within the power plant and install the warehoused 3406 generator complete in its place.

a) Install Korfund isolators between generator frame rail and flooring. Anchor to floor ½" concrete anchors
b) Install new fuel supply and return JIC fittings and hoses.
c) Remove coolant supply and return hoses and piping leading to the appropriate existing flanges Install new companion flanges piping and hoses to meet plumbing requirements. Note: The current 2" copper supply inlet piping may be too small in sizing.
d) Install new spool pipe and exhaust flex to adapt from engine to existing exhaust outlet.
e) Replace required engine seals, O-rings and gaskets. Replace water pump and oil cooler. Install missing oil pressure time delay relay. Remove and install electric actuator off of the failed 3406 to work with the existing speed control. Parallel or standalone operation to be discussed.
f) Terminate load lead cables within generators enclosure.
g) Terminate control wiring.
h) Commission generator

Notes: The 3456 has a history of scuffing cylinder liners before its scheduled rebuild period. The complete cooling system will require flushing and renewed with ELC coolant.

High Standard LLC
John Travens