



Final Version

SC-02-24

SHARED OPERATIONS AND MAINTENANCE AGREEMENT

BETWEEN

US VIRGIN ISLANDS WATER AND POWER AUTHORITY

AND

WÄRTSILÄ CARIBBEAN, INC.

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SHARED OPERATIONS AND MAINTENANCE AGREEMENT

This **Shared Operations and Maintenance Agreement** (the "**Agreement**"), dated as of 29th August, 2023, (the "**Execution Date**"), is made between **Wärtsilä Caribbean, Inc.**, a company organized under the laws of Puerto Rico, with its principal place of business located at Rd. 887 Km. 0.6 Barrio Martin Gonzalez Julio N Matos Industrial Park Carolina, PR 00987 (the "**Operator**"),

and

US VIRGIN ISLANDS WATER AND POWER AUTHORITY, an autonomous governmental instrumentality established under the of the laws of the United States Virgin Islands , with its principal place of business located at 9720 Estate Thomas, St. Thomas, Virgin Islands 00802 (the "**Owner**").

Owner and Operator are individually referred to herein as a "**Party**" and collectively as the "**Parties**".

PRELIMINARY STATEMENT

WHEREAS, Owner owns, operates and maintains a gaseous liquid propane ("**LP**") fired reciprocating engine power plant with a gross electrical capacity of 21.081 MW located at the Randolph Harley Generating Complex in St. Thomas, U.S. Virgin Islands ("**the Facility**") ; and

WHEREAS, Owner and Operator have been under a three year Agreement for the Shared Operations and Maintenance of the Facility since May 15th 2019, as extended by Amendment I, on June 10, 2022; by Amendment II, on August 25, 2022; by Amended III, on September 30, 2022; by Amendment IV, on November 18, 2022; by Amendment V, on December 16, 2022; by Amendment VI, on February 27, 2023; and by Amendment VII, on June 1, 2023, and

WHEREAS, Owner wishes to continue sharing the operations and maintenance of the Facility and will enter into an agreement with such an operator for that purpose; and

WHEREAS, Operator is experienced in mobilization, operations and maintenance of facilities similar to the Facility; and

WHEREAS, Owner desires to utilize the services of Operator in the operations and maintenance of the Facility; and

WHEREAS, Owner and Operator now desire to set forth the terms and conditions under which the Operator shall provide such services for the Facility.

NOW, THEREFORE, in consideration of the mutual covenants contained herein and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, hereby agree as follows:

ARTICLE 1 RULES OF INTERPRETATION AND DEFINITIONS

1.1 Rules of Interpretation

- 1.1.1 Except as otherwise expressly provided herein, capitalized terms used herein are defined in Section 1.2.
- 1.1.2 The headings and paragraph numbering are for convenience only and shall be ignored in construing this Agreement.
- 1.1.3 The singular includes the plural and vice versa, the masculine shall include the feminine and the neuter as the context requires.
- 1.1.4 The words "herein," "hereof" and "hereunder", and words of similar import, shall refer to this Agreement as a whole and not to any particular section or subsection of this Agreement; the words "include," "includes" or "including" shall be deemed to be followed by "without limitation" or "but not limited to", whether or not they are followed by such phrases or words of similar import; and words denoting natural Persons shall be interpreted as referring to corporations and any other legal entities and vice versa.
- 1.1.5 References to Articles, Sections, Recitals, Paragraphs and Appendices are, unless the context otherwise requires, references to articles, sections, recitals, and paragraphs of, or appendices to, this Agreement.
- 1.1.6 A reference to an Appendix is unless the context otherwise requires, a reference to all sub appendices to such Appendix.
- 1.1.7 Reference to any legal Person includes its successors and permitted assigns.
- 1.1.8 For the avoidance of doubt, nothing stated herein shall be construed or interpreted to establish a joint venture, an implied trust, implied contract or implied agency between the Operator and Owner or a transfer of intellectual property rights to Owner.
- 1.1.9 This Agreement is the result of negotiations between, and has been reviewed by, each Party and/or its legal counsel. Accordingly, this Agreement shall be deemed to be the product of both Parties and there shall be no presumption that an ambiguity should be construed in favour of or against a Party solely as a result of such Party's role in drafting this Agreement. Each waiver, exclusion or limitation of liability expressed herein results from a negotiation process and is deemed fair by the Parties in light of the overall terms and conditions of this Agreement.
- 1.1.10 Owner acknowledges and agrees that this Agreement does not create a consumer relationship and that the services contemplated herein are used by Owner in connection with the performance of its business activities.


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1.2 Definitions

ADR: Shall have the meaning as set forth in Section 15.1.

Affiliate: Shall mean with respect to any Party hereto, any entity that is a direct or indirect parent or subsidiary of such Party or that directly or indirectly: (i) owns a majority interest or controls such Party; (ii) is owned or controlled by such Party; or (iii) is under common ownership or control with such Party. For the purposes of this definition, "control" shall mean the power to direct the management or policies of such entity, whether through the ownership of voting securities, by contract or otherwise. For purposes of this Agreement, Owner and the Operator shall not be deemed to be Affiliates of each other.

Agreement: Shall mean this Operations and Maintenance Agreement.

Annual Availability: Shall mean the availability of each Wartsila Generator Set as per calculations set forth in Appendix 3.

Annual Availability Guarantee: Shall mean the guarantee that the Annual Availability shall not be lower than the value as set forth in Appendix 3.

Annual Operating Plan: Shall mean the annual operating plan prepared by Operator substantially in the form of Appendix 7.

Annual Turn Over: Shall mean the total received Operating Fee by Operator during an Operating Year.

Appendix/Appendices: Shall mean any of the appendix /appendices listed in the table of contents.

Authorization: Shall mean any approval, consent, license, permit, waiver, exemption, authorization or other permission to be granted by a Governmental Authority required for the construction, ownership, operations and maintenance of the Facility or the enforcement of rights or the performance of obligations under this Agreement by a Party.

Bankruptcy: Shall mean the occurrence of any of the following events: (i) the passing of a resolution by the shareholders of Owner or Operator for the winding up of Owner or Operator, respectively; (ii) the admission in writing by Owner or Operator to the other Party, of its inability generally to pay its debts as they become due; (iii) the appointment of a provisional manager, receiver, trustee or liquidator in a winding up proceeding after notice to Owner or Operator and due hearing, as appropriate; or (iv) the making by a court of competent jurisdiction of an order winding up Owner or Operator.

Change of Law: Shall mean: (i) the enactment, adoption, promulgation, and modifications or repeal of any Governmental Rule or Authorization after the Effective Date; or (ii) the adoption of a new official interpretation of any Governmental Rule or Authorization after the Effective Date; or (iii) the issuance of resolutions or other administrative acts by any Governmental Authority after the Effective Date.

Change Order: Shall have the meaning as set forth in Section 6.1.

Change Order Proposal: Shall have the meaning as set forth in Section 6.2.1.


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Commercial Date of Delivery or COD: Shall mean June 6, 2019.

Contractor: Shall mean Wärtsilä North America, Inc. who were contracted by Owner to engineer, procure, construct, commission and test the Facility, or any of their subcontractors, under the Construction Contract.

Construction Contract: Shall mean the agreement for the construction of the (1) 21.081 MW power plant between the Owner and Wärtsilä North America, Inc. as Contractor dated as of the 15th March 2017.

Confidential Information: Shall mean any information or data (including all oral and visual information or data and all information or data recorded in writing or in any other medium or by any other method) disclosed to or obtained by Owner under this Agreement.

Contract Manager: Shall mean Operator's representative as appointed pursuant to Section 2.1.3.

Cost to Remedy: Shall mean the estimated cost to remedy a Loss. The estimated cost shall be based upon the prevailing price lists of Operator or its subcontractors.

Country: Shall mean the U.S. Virgin Islands.

Damage Surveyor: Shall have the meaning as set forth in Section 4.3.

Damage Surveyor Report: Shall have the meaning as set forth in Section 4.3.

Daily Report: Shall mean the daily operations report that is provided from the Operator to Owner by 10:00 a.m. each Day.

Day: Shall mean the 24-hour period beginning and ending at 12:00 midnight.

Dollar or US\$ or USD: Shall mean the lawful currency of the United States of America.

Effective Date: Shall have the meaning as set forth in Section 7.1.

Electrical Capacity: Shall mean the capacity of the Facility as per calculations set forth in Appendix 3.

Electrical Capacity Guarantee: Shall mean the guarantee that the Electrical Capacity shall not be lower than the value established in accordance with Appendix 3.

Electrical Capacity Test: Shall mean a capacity test for the Facility to be conducted four times per year as set forth in the guidelines and procedures in Appendix 4.

Electrical Energy: Shall mean the electrical energy measured at each engines respective Power Monitor Unit during an Electrical Power Test.

Electrical Energy for Heat Rate Test: Shall mean the Electrical Energy measured at the Heat Rate Guarantee Point during a Heat Rate Test.

Electrical Power: Shall mean the electrical power calculated from the measured Electrical Energy during an Electrical Power Test.

Electrical Power Test: Shall mean the Electrical Power for the Facility to be conducted four times per year as set forth in the guidelines and procedures in Appendix 4.

Emissions Guarantee: Shall mean the emissions guarantee set forth in Appendix 3, Section 5.

Engine Running Hour: Shall mean every hour each Wärtsilä Generator Set is running as measured and recorded by the Power Monitor Unit.

European Producer Price Index (EPPI): Shall mean the index known as *“Producer prices in industry, total – monthly data” – subheading “European Union – 27 countries (from 2020)” and “Statistical classification of economic activities in the European Community (NACE Rev. 2) [nace_r2]: [C] Manufacturing”, (Index 2015=100)* as published in the Eurostat database <https://ec.europa.eu/eurostat/web/main/data/database>, under the headings: *“Industry, trade and services” à “Short-term business statistics” à “Industry” à “Producer prices in industry” à “Producer prices in industry, Total” à “Producer prices in industry Total – monthly data”,* or any valid update, modification or replacement of the European Producer Price Index and/or its criteria. As the EPPI index is re-indexed from time to time (the reference year for which the index is 100 is changed, e.g. 2010=100 is re-indexed to 2015=100) the newest index is to be used. The change in index is calculated from the previous adjustment occurrence to the new adjustment occurrence. When a re-index occurs, the historical values are recalculated to match the new index in the published tables.

Exchange Spare Parts: Shall mean the Owner’s exchange spare parts listed in Appendix 2A.

Excluded Equipment: Shall mean concrete foundations, tanks and tank farms, power house, stacks, step-up transformer windings and bodies and major switchyard components.

Execution Date: Shall mean the date the Parties sign the Agreement.

Expertise Center means Operator’s expertise center.

Expert Insight means the Operator’s program, used in the Expertise Centre, to perform analysis of the operating data of the generating set forming part of the Facility by using i) artificial intelligence (AI) techniques, ii) advanced diagnostics rules and (iii) an assigned expert in the Expertise Centre.

Facility: Shall mean the Wartsila 3 x W20V34LPG Power Station installed at the Randolph Harley Power Plant (the “RHPP”), as set forth in Appendix 1.

Fixed Fee: Shall have the meaning as set forth in Section 5.3.

Facility Site: Shall mean the RHPP site as set forth in Appendix 1.C where the Facility is located.

Force Majeure: shall mean any cause or occurrence affecting the ability of a Party to perform its obligations under this Agreement, which cause or occurrence is beyond the reasonable control of the Party affected and not due to an act or omission of the Party affected and which could not have been avoided by the exercise of reasonable diligence, including, acts of God or the public enemy;


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expropriation or confiscation of facilities; compliance with any Governmental Rule or Authorization, including issues related to compliance arising from the failure of a duly authorized governmental authority to issue an Authorization or revision thereto; trade or economic sanction; sabotage, acts of war (declared or undeclared); blockade; embargo; insurrection; hostilities; civil unrest; riots; military or guerrilla action; terrorist activity or threats of terrorist activities which, under the circumstances, would be considered a precursor to actual terrorist activity; banditry; abnormally adverse weather conditions not reasonably anticipated by the Parties; adverse weather conditions on the high seas; inability to obtain and maintain rights of way for, or ingress to or egress from the Facility Site, necessary for the performance of the Work; unforeseen soil and subsoil conditions; fires; floods; explosion; accidents; riots; strikes, work stoppages, boycotts, walkouts or other labour disturbances, failures in common carrier services or utility services; epidemics or any causes, whether or not of the same class or kind as those specifically named above, which are not within the reasonable control of the Party affected and which, by the exercise of reasonable diligence, the Party affected is unable to prevent. The Parties expressly agree that each of (i) Pandemics and (ii) the sudden or unforeseeable shortage, unavailability or extended lead times of components, raw materials, labor or services shall be deemed a Force Majeure event under this Agreement. Further, and accordingly any existing arrangements that are, at the time of this Agreement, already affected by the said events shall not be within the control of a Party.

Governmental Authority: Shall mean the Government of the Country and any state or local government or other political subdivision thereof, or any governmental, quasi-governmental, judicial, public or statutory instrumentality, administrative agency, authority, body or other entity thereof having proper jurisdiction in respect of this Agreement or either Party or the Facility.

Governmental Rule: Shall mean any foreign, national, state, provincial or local statute, law, regulation, ordinance, rule, term or provision of an Authorization, constitution, ministerial accord, order, decree, regulation, directive, judgment, injunction, writ or similar action or decision duly implementing any of the foregoing which has been enacted, issued or promulgated by any Governmental Authority having jurisdiction in respect of this Agreement or either Party or the Facility.

Hazardous Substances: Shall mean “hazardous substances” or “pollutant” or “opacity” or “contaminant”, including any material designated as a “hazardous substance”, “hazardous waste” or “waste” pursuant to the Governmental Rules or Authorizations or the regulations promulgated thereunder, or any other pollutant or substance which may be the subject of liability for costs of response or remediation.

Heat Rate: Shall mean the average ratio of the total fuel energy consumed over the Electrical Energy for Heat Rate Test, as recalculated to site reference conditions, as set forth in Appendix 4.

Heat Rate Guarantee: Shall mean the guarantee that the Heat Rate during a Heat Rate Test shall not exceed the value stated in Appendix 3.

Heat Rate Guarantee Point: Shall mean the point, as specified in Appendix 4 where the Electrical Energy is measured during the Heat Rate Test.

Heat Rate Test: Shall mean a test conducted as set forth in Appendix 4 to determine the Heat Rate.


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Indemnified Party: Shall have the meaning as set forth in Section 10.3.

Indemnifying Party: Shall have the meaning as set forth in Section 10.3.

Interconnection Point: Shall mean the electrical interconnection point as set forth in Appendix 1.A and in Appendix 1.B.

LD Notice: Shall have the meaning as set forth in Section 5.8.

Loss: Shall mean any Unplanned Maintenance, breakdown, theft, loss, defect, destruction, damage or failure (other than a Major Generator Breakdown) in the Facility, the Facility Site, or in any part thereof.

Lube Oil Consumption: Shall mean the average annual lube oil consumption of the Wartsila Generator Set as per calculations set forth in Appendix 3.

Lube Oil Consumption Guarantee: Shall mean the guarantee that the Lube Oil Consumption shall not exceed the value stated in Appendix 3.

Major Generator Breakdown shall mean an unforeseen and sudden internal physical damage to any of the Wartsila Generator Set, occurring during the term of this Agreement, necessitating repair or replacement and which Cost to Remedy exceeds Seventy Five Thousand USD (\$75,000).

Maximum Running Hour Limit: shall mean the maximum hours for a Generator Set over the term of the Agreement.

Month: Shall mean a calendar month according to the Gregorian calendar beginning at 12:00 midnight on the first Day of the month and ending at 11:59pm on the last Day of that month.

Monthly Operations Report: Shall mean the report prepared by Operator monthly basis which shall include to the extent applicable: (i) an accident/incident report; (ii) a maintenance summary for the Month and maintenance planned for the forthcoming Month; (iii) fuel and lubricating oil inventory; and (iv) Facility Performance Parameters.

Notification of Loss: Shall have the meaning as set forth in Section 4.2.

Original Equipment Manufacturer or OEM: Shall mean original equipment manufacturer that designed and/or manufactured the components and/or products that make up the Facility.

Operating Fee: Shall mean the fees which Owner shall pay to Operator as set forth in Section 5.3.

Operating Period: Shall mean the period commencing from the Effective Date until the expiry or earlier termination of this Agreement.

Operating Year: Shall mean any of the following:

- (i) the initial period from the Effective Date to December 31st of the year in which the Effective Date occurs;

- (ii) each full calendar year period occurring after the initial period during the Operating Period; and
- (iii) the last period from January 1st of the last year in the Operating Period until and including the last Day of the Operating Period.

Operator Default Notice: Shall have the meaning as set forth in Section 7.2.2.

Operator Event of Default: Shall have the meaning as set forth in Section 7.2.2.

Operator Loss: Shall mean any Major Generator Breakdown and any Loss except for any Owner Loss.

Operator Taxes: Shall mean taxes imposed on Operator's corporation, property, and payroll taxes imposed on Operator's personnel, as well as gross receipts tax.

Owner Default Notice: Shall have the meaning as set forth in Section 7.3.2.

Owner Event of Default: Shall have the meaning as set forth in Section 7.3.2.

Owner Loss: Shall mean:

- (i) any Loss (other than a Major Generator Breakdown), to the extent the Cost to Remedy exceeds Seventy Five Thousand (\$75,000 USD) Dollars except to the extent that such Loss is directly due to the Operator's gross negligence or Wilful Misconduct; or
- (ii) any Major Generator Breakdown or Loss:
 - (a) arising out of Force Majeure, except for a Loss to Operator's property or personnel;
 - (b) arising out of acts or omissions of Owner under this Agreement or any matter for which Owner is responsible;
 - (c) arising out of acts or omissions by Third Parties, except for a Loss to Operator's property or personnel;
 - (d) to Excluded Equipment or arising as a result of a Loss to Excluded Equipment;
 - (e) to Third Party Equipment or arising as a result of Third Party Equipment, except for a Loss to Operator's property or personnel;
 - (f) covered under warranty under the Construction Contract; or
 - (g) arising out of acts, omissions, or failure of Owner's Personnel to adhere to Operator's procedures and instructions.
- (iii) Notwithstanding the foregoing, the Parties agree that the costs to remedy any Owner Loss to the Facility Site (exclusive of the Wartsila Generator Set) shall be borne proportionately to the extent of each Party's simple or gross negligence for any amounts in excess of \$75,000 USD and up to \$500,000 USD, only.


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Owner's Personnel: Shall mean the operation and maintenance personnel made available to Operator by Owner as further detailed in Appendix 10 preliminary organization chart. Owner's personnel shall remain under Owner's payroll and responsibility for the duration of the Agreement.

Owner Payment Security: Shall have the meaning set forth in Section 5.7.

Owner's Representative: Shall mean US Virgin Islands Water and Power Authority representative as appointed pursuant to Section 3.1.14.

Owner's Safety Policy: Shall mean the Owner's safety policies as set forth in Appendix 11.

Performance Guarantees: Shall mean the performance parameters guaranteed by Operator as set forth in Appendix 3.

Performance Liquidated Damages: Shall mean the liquidated damages as set forth in Article 8.

Performance Parameters: Shall mean the Electrical Energy, the Heat Rate and the availability of the Facility.

Performance Test: Shall mean the Heat Rate Test and the Electrical Power Test following the guidelines of Appendix 4.

Person: Shall mean any natural person or any company, partnership, company, joint venture, firm, corporation, association, trust, enterprise or other body corporate or any Governmental Authority.

Planned Maintenance: Shall mean maintenance and/or overhauls of the Wartsila Generator Sets other equipment incorporated into the Facility which have been scheduled in accordance with the Annual Operating Plan and the Preventive Maintenance Program as established by the Original Equipment Manufacturer ("OEM").

Power Monitor Unit: Shall mean the device located at the control panel in the control room of the Facility which measures and records the Engine Running Hours among other parameters. This device will be used for gathering the data for the Variable Fee.

Preventive Maintenance Program: Shall have the meaning as set forth in Section 2.3.8.

Prohibited Payment: Shall mean any offer, gift, payment, promise to pay or authorization of the payment of any money or anything of value, directly or indirectly, to or for the use or benefit of any official (including to or for the benefit of any other Person if Operator or Owner knows, or has reasonable grounds for believing, that the other Person would use such offer, gift, payment, promise or authorization or payment for the benefit of any such official) for the purpose of influencing any act or decision or omission of any official in order to obtain, retain or direct business to, or to secure any improper benefit or advantage for, Operator or Owner, its Affiliates or any other Person in connection with the Facility or this Agreement.

Prudent Operating Practice: Shall mean those practices and methods and acts which, in the exercise of reasonable judgment in the light of the facts known to a Party at the time that a decision was made, could reasonably have been expected to accomplish the desired result at a reasonable cost consistent


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with licensing and regulatory considerations, environmental considerations, and in a manner consistent with applicable OEM requirements and industry standards and codes. Prudent Operating Practice is not intended to be limited to optimum practice or methods to the exclusion of all others, but rather shall be a spectrum of reasonable and prudent practices, methods or acts employed by operators of facilities similar in size and operational characteristics to the Facility that take into consideration the conditions specific to the Facility and the exercise of judgment, including those involving the use of new concepts of technology.

Punch List: Shall have the meaning set forth in Section 2.2.4.

Quarter or Quarterly: shall mean a consecutive three-month period.

Reimbursable Costs: Shall mean costs incurred by Operator as defined and in accordance with Section 5.3.c.

Safety Spare Parts: Shall mean Operator's spare parts maintained at the Facility as per Appendix 2A.

Services: Shall mean the Operator's obligations as set forth in this Agreement.

Taxes: Shall mean any taxes including without limitation withholding taxes, asset taxes, property taxes, duties (including import and custom duties), stamp duties, tariffs, fees, income taxes, sales taxes, value added taxes, or other charges, including surcharges, interests and penalties imposed thereon, imposed by any applicable Governmental Authority pursuant to any Governmental Rules or Authorizations.

Technical Advisor: Shall mean the person(s) who will advise the Owner on the Planned Maintenance and/or Unplanned Maintenance as detailed in Appendix 18 or as may otherwise be performed under this Agreement.

Technical Labour or Technical Labourer: Shall mean the personnel who may perform the labour for the Planned Maintenance and/or Unplanned Maintenance as set forth in Appendix 18 or as may otherwise be performed under this Agreement.

Third Party: Shall mean any Person that is not the Owner or the Operator.

Third Party Equipment: Shall mean equipment and spare parts not provided by Operator or any of its Affiliates.

USCPI: Shall mean the "Consumer Price Index Published by US Department of Labor, Bureau of Labor Statistics on <http://www.bls.gov> è Databases & Tables è All Urban Consumers (Current Series) (Consumer Price Index – CPI) è Top Picks è U.S. All Items, 1982-84 =100, CUUR000SA0 è Retrieve Data.

Unplanned Maintenance: Shall mean any maintenance except for Planned Maintenance.

Variable Fee: Shall have the meaning as set forth in Section 5.3.

Wartsila Generator Set: Shall mean each of the (3) three Wärtsilä generator set units, each consisting of the assembly of a Wärtsilä 20V34LPG engine, flywheel, mechanical coupling and generator.

The logo consists of the letters "DMR" in a stylized, handwritten-style font, with a horizontal line underneath the letters.

Weekly Report: Shall mean the weekly operations report provided by Operator to Owner each Friday at 1600.

Wilful Misconduct: Shall mean a conscious and voluntary act or omission of a Party in reckless disregard of a legal duty (including contractual duty), which seriously deviates from a diligent course of action and which disregards the harmful consequences to the other Party.

Work: Shall mean Operator's obligations as set forth in this Agreement.

Year: Shall mean a consecutive twelve (12) Month period.

ARTICLE 2 OPERATOR'S RESPONSIBILITIES

2.1 General

- 2.1.1 O&M Obligations. Operator shall be responsible for the operations and maintenance of the Facility, and shall perform or cause to be performed the services and related activities provided for in this Agreement. Operator shall cause the Facility to be operated and the services to be performed in accordance with Prudent Operating Practices and other terms and conditions of this Agreement. In addition, Operator shall make all reasonable and practical efforts to ensure that the Facility shall at all times be kept in good and clean condition.
- 2.1.2 Not Used.
- 2.1.3 Contract Manager. Operator shall notify Owner, in writing, by the COD of the individual to act as the Contract Manager (the "**Contract Manager**") and as soon as possible of any changes in the identity of the Contract Manager. The Contract Manager shall be authorised and empowered to act for and on behalf of Operator in all matters concerning this Agreement during the Operating Period.
- 2.1.4 Within thirty (30) Days of the Execution Date, Operator shall provide to Owner an executed parent company guarantee, substantially in the form attached hereto as Appendix 13, to be in force over the term of the Agreement.
- 2.1.5 Operator agrees to comply with Owner's general terms and conditions as set forth in Exhibit 17.

2.2 Not Used

2.3 Operating Period

During the Operating Period:

- 2.3.1 Operations and Maintenance. Except as set forth elsewhere in this Agreement, Operator shall have the responsibility to provide operations and maintenance services necessary to operate and maintain the Facility in accordance with Prudent Operating Practice.
- 2.3.2 Electrical Energy Delivery. Operator shall coordinate Facility outages and power deliveries with Owner in accordance with the Annual Operating Plan. The Electrical Energy delivery services to be provided by Operator shall include, but not limited to the operational services of isochronous control and droop control for frequency regulation, voltage regulation, reactive power control, Facility isolation, and start-up of the Facility following a system shutdown.
- 2.3.3 Annual Operating Plan. During the initial Operating Year, Operator shall provide to Owner an initial Annual Operating Plan within 15 days of execution of the Agreement. Thereafter, Operator shall no later than one hundred and twenty (120) Days prior to the beginning of each Operating Year (other than the initial Operating Year), but no earlier than sixty (60) Days after Operator's receipt of Owner's proposed Facility dispatch, prepare and submit to Owner, for its review and approval, a proposed Annual Operating Plan. Owner shall, within 60 days of receipt of the Annual Operating Plan from Operator, propose amendments to any aspect of the Annual Operating Plan it deems necessary. Where an amendment is proposed the Parties shall use reasonable efforts to settle the terms of the Annual Operating Plan. If Operator does not receive any objection or proposed amendment to the Annual Operating Plan thirty (30) Days before the beginning of the Operating Year the proposed Annual Operating Plan shall be deemed to be approved by Owner.
- 2.3.4 Manuals. Operator shall regularly update as necessary the operation and maintenance manuals of the Wartsila Generator Set and, when updated, provide access through the online tools in order for the Owner to download such updated manuals.
- 2.3.5 Operations Report. Operator shall provide daily reports, weekly, and monthly operations reports. The daily report shall be provided by 10:00 a.m. each Day. The weekly report shall be provided each Friday at 1600. The Operator shall, within five (5) Days after the end of each Month, prepare and submit to Owner a Monthly Operations Report in a form to be agreed upon by the Parties. This report shall include a report on the Performance Parameters. Operations Reports must include emissions data via the hourly continuous monitoring system of the emissions.
- 2.3.6 Personnel. Operator shall provide and pay sufficient numbers of skilled personnel to perform the Work in accordance with Prudent Operating Practices, applicable Governmental Rules, the manuals, and ensure that sufficient numbers of personnel are on duty during the performance of the Work. Provided, however, that Owner shall provide during the Operating Period, at its own cost, personnel as provided in Section 3.1.7.
- 2.3.7 Records. Operator shall maintain at the Facility accurate and up to date operating logs, records and the Operations Reports for the term of the Agreement. Such operating logs shall include, but not limited to: (i) real and reactive power production during each hour the Facility is dispatching Electrical Energy; (ii) changes to the Facility's operating status; (iii) Heat Rate of Wartsila Generator Set; (iv) emissions monitoring of Facility; and (v) the number of start-ups of each Wartsila Generator Set.

- 2.3.8 Preventive Maintenance Program. The Operator shall prepare, implement, and update a preventive maintenance program (the “**Preventive Maintenance Program**”). The Preventive Maintenance Program shall be consistent with the requirements of this Agreement. The Preventive Maintenance Program shall cover the regular inspection, testing, calibration and servicing of the equipment, instrumentation and components utilized in connection with the operation of the Facility. The Preventive Maintenance Program shall establish a reporting system which shall include: (i) the scheduling and tracking of preventive maintenance Work to be performed in relation to the Facility; (ii) the documentation of any major maintenance problems encountered when undertaking such preventive maintenance Work; and (iii) the documentation of the preventive maintenance Work performed. The Operator shall provide the Preventive Maintenance Program to the Owner as soon as possible after the Effective Date and shall include information from Appendices 18, 19, and 20. For clarity, the Operator will be using the Owner’s CMMS (Maximo system) that will be updated by the Operator.
- 2.3.9 Technical Evaluations. Upon the reasonable request by Owner for technical evaluations of the Facility, above and beyond the continuous evaluations shared through the Expert Centre, Operator shall remit the requested report, provided, however, if Operator is required to utilize outside subcontractors or additional personnel to perform such technical evaluations for non OEM equipment, Operator shall request a Change Order as set forth in Article 6.
- 2.3.10 Equipment Overhauls and Maintenance. Operator shall perform Planned Maintenance and remedy any Operator Loss required on the Wartsila Generator Sets and the other equipment present at the Facility.
- 2.3.11 Delivery Terms. Operator shall procure all the spare parts and inventory required for the Work on a DAP Facility, St. Thomas, USVI Incoterms® 2020 basis. For customs clearance and local transportation, the Operator shall arrange for customs clearance of all of the imported equipment, spare parts, materials or supplies for the Facility during the Operating Period. Any cost of the customs clearance shall be charged to the Owner as a Reimbursable Cost.
- 2.3.12 Tools, equipment, and Consumables. Operator shall procure, provide, and maintain adequate quantities of consumables and supplies (other than LP, lube oils, and water) as well as procure, provide, and maintain adequate hand tools and equipment to ensure the reliable operation of the Facility. Operator shall repair or replace any equipment and tools listed in Appendix 2B or provided by Owner pursuant to Section A7 of Appendix 1 of the Construction Contract that may be damaged by the Operator during the term of this Agreement. The repair or replacement of the tools shall not be included within Owner Loss. At the term of this Agreement, the Operator shall hand over all equipment and tools listed in Appendix 2B or provided by Owner pursuant to Section A7 of Appendix 1 of the Construction Contract.
- 2.3.13 Engineering Support. Operator shall provide technical engineering support for solving operations and maintenance problems. If Operator is required to utilise outside subcontractors or additional personnel for non OEM equipment to solve operations and maintenance problems, Operator shall request a Change Order as set forth in Article 6.
- 2.3.14 Capital Improvements. Operator may recommend to Owner modifications and improvements to the Facility and shall request such modifications or improvements as a Change Order.


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- 2.3.15 Accounting Records. Maintain accounting records regarding the Work in accordance with international generally acceptable accounting principles.
- 2.3.16 Meetings and Communication with Governmental Authorities. At the reasonable request of Owner, Operator shall cooperate in communications with, or the providing of information to, Governmental Authorities.
- 2.3.17 Daily and weekly planned availability reports. Operator shall prepare and submit to Owner, every day, a daily planned availability report; and every week a weekly planned availability report; in a form to be agreed upon by the Parties. These reports shall include the planned availability of real and reactive power of the Facility for the following day or week respectively.
- 2.3.18 Measurements and Calibration. Operator shall read, operate, maintain, test and recalibrate all tools, controls, instrumentation and measuring devices in accordance with Prudent Operating Practice.
- 2.3.19 Warranties. Operator shall with respect to the Facility or any part thereof, identify, investigate, administer, file and enforce (whether directly or on Owner's behalf) all manufacturer, subcontractor and vendor warranties and guarantees obtained by Operator or by Owner.
- 2.3.20 Forecasting Requirements for Operating Media. Based upon the dispatch of the Facility, Operator shall forecast the Facility's LPG, lube oil requirements, cooling water treatment, raw water requirements, and emission abatement products and provide forecasts of such fluids requirements to Owner not later than ninety (90) days in advance. Operator shall also monitor the quantity and quality of LPG, lube oil, chemicals, and water which shall include the taking of samples and having such samples tested to determine their strict compliance with Appendix 5. Operator shall not be responsible for the quality of such fluids supplied by Owner nor for any costs, damages, and expenses resulting directly from fluids which are not in accordance with the specifications set forth in Appendix 5. In the event that the Operator fails to provide the forecast of the fluids requirements as specified in this Section 2.3.20, and as a result the Owner is not able to purchase and deliver the operating media required for the operation of the Wartsila Generator Set, the resulting shut down time for the Wartsila Generator Set shall not be counted as standby hours in the calculation of the Annual Availability.
- 2.3.21 Required Authorizations. With the reasonable assistance of Owner, Operator shall obtain, maintain and comply with all Authorizations necessary to be obtained by Operator to perform the Work and comply with all Governmental Rules and any other obligations contemplated hereunder. At the request of Owner, Operator shall provide reasonable assistance to Owner in obtaining and maintaining all Authorizations required for Owner to comply with any Governmental Rules; provided however, that Owner shall be responsible to obtain any Authorizations necessary to start delivery of energy to the grid.
- 2.3.22 Taxes. Operator shall pay all Operator Taxes.
- 2.3.23 Subcontractors. Operator shall hire, schedule and supervise all of the subcontractors and vendors that may be required, in Operator's reasonable judgment, to assist in the performance of the Work. All subcontractors shall be qualified, licensed (to the extent required by applicable


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law) and experienced in the duties which they are contracted to provide, consistent with qualification and experience levels which are typical for contractors performing similar functions for facilities similar to the Facility.

- 2.3.24 Insurance. Operator shall provide and maintain the insurance coverage's set forth in Article 12.
- 2.3.25 Fire Protection. Operator shall perform regular testing and inspections of, and maintain all fire protection and safety equipment at the Facility, including tests and inspections required by any Governmental Authority.
- 2.3.26 Performance Testing. Operator shall perform a Quarterly Performance Test at the end of each Quarter, during each Year after the COD, at a time mutually agreed between the Parties.
- 2.3.27 Auditing of Inventory. Operator and Owner shall audit the inventory of the Operator during the term of this Agreement every six (6) months.
- 2.3.28 Not Used.
- 2.3.29 Training. Operator and Owner shall exchange operational knowledge and information while working jointly. Operator shall implement the training program (the "**Training Plan**") for Owner's Personnel development by the Operator. The training program shall include on and off Facility Site training. The Training Plan schedule shall be reported monthly within the Monthly Report and annually in the Annual Plan. Training occurring off Facility Site, or using training personnel from the Wärtsilä Land and Sea Academy at the Facility Site, or using external contractors shall be proposed separately to the Owner, and agreed upon as an addendum to this Agreement.
- 2.3.30 Operator's Management Personnel. In addition to the Contract Manager, Operator shall provide all additional supervisory personnel as deemed necessary, in Operator's reasonable judgment, for Operator to perform the Work. The Operator shall present the nomination of a team leader to the Owner for approval, which approval shall not be unreasonably withheld.
- 2.3.31 Hiring of Operator's Personnel. Operator shall interview, evaluate and hire all operations and maintenance and administrative personnel that, in Operator's reasonable judgment, are necessary and in sufficient numbers for Operator to perform the Work. Operator's personnel need to have the Transportation Work Identification Credential, TWIC, card.
- 2.3.32 Employment Standards. Operator shall ensure that all Operator's personnel shall be qualified in the duties to which they are assigned and shall have qualifications and experience levels which are typical for personnel managing, supervising, administering, operating and maintaining power plants that are similar to the Facility.
- 2.3.33 Safety Spare Parts, Safety Parts Inventory Control and Tracking System. Operator shall manage for the Owner the inventory of spare parts listed in Appendix 2A. These spare parts shall be stored at Facility Site. The Operator shall maintain the minimum level of Safety Spare Parts that is required for the CEMS and RTO units to operate in compliance of the Governmental Rules and Authorization. During the term of this Agreement, the Operator may use and shall


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replenish any Safety Spare Parts. The Operator shall utilize the Owner's CMMS (Maximo system) computer based spare parts inventory control and tracking system designed to facilitate the accurate accounting for the spare parts and tools and equipment located at the Facility during the mobilization period. The Operator shall establish and furnish as part of the inventory of Safety Spare Parts a minimum level of spare parts that are required to be on site at all time for the continuous emissions monitoring system (herein after referred to as "CEMS") and regenerative thermal oxidizer (herein after referred to as "RTO") units which directly affect the emissions control level.

- 2.3.34 **Cybersecurity Protection.** To the extent that the Operator is supplying any equipment to be integrated into the Facility, the Operator shall deliver such equipment together with its logic-bearing system components (e.g., hardware, firmware, and software hereafter referred to collectively as the "Critical Components") free of any software virus and malware detectable by Prudent Operating Practice. The Operator shall be responsible for any system integrations and/or system security engineering. It is the Operator's responsibility to protect Critical Components from any External Cybersecurity Threat or Internal Cybersecurity Threat, including against hardware and software vulnerabilities. In recognition of the foregoing, the Operator agrees and covenants that it shall use the degree of care appropriate to prevent unauthorized access, use, or hacking of the Critical Components provided in connection with equipment supplied by the Operator and shall do so in a manner that is no less rigorous than any recommendations provided by the Operator and accepted industry practices. Owner agrees to collaborate and assist Operator in its compliance with its responsibilities in this paragraph, in accordance with the Prudent Operating Practices.
- 2.3.35 **Emissions Testing.** The Owner may request, at any time that does not interfere with plant operations, for the Operator to perform an emissions test. Owner shall be responsible for all third party costs involved in performing the test as a Reimbursable Cost. The Operator shall make available its personnel to perform such test, at no additional cost to the Owner.
- 2.3.36 **Chemicals.** Operator shall forecast the needed cooling water treatment chemicals for the Wartsila Generator Sets and provide this forecasting to Owner in the monthly reporting allowing time for the Owner to procure the future treatment chemical needs.
- 2.3.37 **Remote Monitoring.** Operator shall use the Wartsila remote monitoring system to support the local operating team with trending and troubleshooting for the Facility. Remote monitoring is not intended and shall not provide to the Operator the ability to control the operations of the Facility remotely, or to make changes to the software or control parameters via the remote connection.
- 2.3.38 **Housing of Operator personnel.** Operator shall pay for the housing of the Operators personnel and charge to Owner as a Reimbursable Cost.
- 2.3.39 **Vehicles for Operator use.** Operator shall be responsible to provide up to two (2) vehicles for Operator during the term of this Agreement.


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- 2.3.40 Operator to provide a legally compliant office container for its personnel during term of this Agreement.
- 2.3.41 Test Procedures. Operator shall establish fuel, lubricating oil and water quality test procedures as per the Appendix 5 specifications with the supplier of the fuel and the lubricating oil. The water quality test will be established as per Appendix 5.C.
- 2.3.42 O&M and Dispatch Procedures. In coordination with Owner, Operator shall develop, implement, and update dispatch procedures for (i) the day-to-day communications protocol among the power plant and Owner Control Operations Supervisor/Manager, (ii) the dispatch format for notification for the Facility, (iii) dealing with emergency situations and (iv) recovery from shutdown or blackout conditions (collectively, the “**Dispatch Procedures**”). In coordination with Owner, Operator shall develop, implement, and update operations and maintenance procedures and policies that are consistent with the requirements of this Agreement.
- 2.3.43 Operator shall review Owner’s safety policies to assess the safety equipment required for Operator’s personnel. Operator shall provide Operator’s safety equipment to its own personnel meeting the OSHA and Owner’s Safety Policy.
- 2.3.44 Operator hereby transfers custody of the Safety Spare Parts and Exchange Spare Parts to the Owner. Title and ownership to those parts shall be transferred upon full payment to the Operator as per the terms of Section 5.6.5.

ARTICLE 3 OWNER'S RESPONSIBILITIES

3.1 Owner's Responsibilities

Owner shall perform the obligations in this Article 3: (i) at its own cost and risk; (ii) at such times and in such manner as may be requisite to Operator's expeditious and orderly performance of its obligations; and (iii) in accordance with Prudent Operating Practice and the other provisions of this Agreement.

- 3.1.1 Payment. Owner shall pay, by no later than their respective due dates, the Operating Fee, Reimbursable Costs, Change Orders and other amounts owed to Operator in accordance with this Agreement. In the event Owner disputes an invoice, Owner shall pay the undisputed portion of such invoice and send Operator within 7 days of the due date of such invoice a summary of the reasons for such dispute and shall provide supporting documents.
- 3.1.2 Access to the Facility. Owner shall ensure that Operator and its subcontractors shall have free, unencumbered and safe access to the Facility at all times and that the Facility at all times shall be in compliance with Governmental Rules and Authorizations.

- 3.1.3 Utilities. Owner shall arrange and pay for wastewater and sewage disposal services and other utilities (including water, communications, internet broadband and electricity) required for the Facility and the Work and dispose of any and all waste, sludge and Hazardous Substances in accordance with all Governmental Rules and Authorizations. In respect to communications and internet broadband, Operator shall be responsible for recurring charges.
- 3.1.4 Waste products and Hazardous Substances. Subject to the provisions of Article 11, Owner shall take appropriate actions and be responsible, at its own expense, for the removal, remediation, and avoidance of any sludge, waste products and Hazardous Substances present on, under, in, or by the Facility Site as required for compliance with Environmental Laws; provided, however, that Operator shall collect such sludge, waste generated by the operation of the Facility in suitable containers, made available by Owner to Operator, at the Facility. The handling of Hazardous Substances will be Owner's responsibility.
- 3.1.5 Security. Owner shall provide Operator the information necessary for Operator to comply with Owner's current security plan. Owner shall be responsible for providing security, including security equipment and security personnel, as reasonably necessary, and in accordance with Owner's security policy, to minimize any risk relating to the safety of records, assets, property and personnel at the Facility.
- 3.1.6 Roads and Landscaping. Owner shall maintain all roads, parking lots, walkways, fences, drainage and general landscaping at the Facility Site including cutting of grass and trimming of trees. If, through the negligence of the Operator, the roads, walkways, fences, or drainage are damaged or destroyed by the Operator's personnel, then the Operator will be responsible for the cost of repair at the Facility Site.
- 3.1.7 Owner's Personnel. Owner shall provide to Operator, personnel in accordance to Appendix 10 and Appendix 18 during the Operations Periods. The Operator shall inform the Owner's Representative with regard to the Owner's Personnel that may be required to perform the Work at the Facility during the Operating Period. The Owner's Representative shall ensure that Owner's Personnel are provided in the numbers and with the qualifications requested by Operator, and that Owner's Personnel follow Operator's instructions and procedures. In the event of the unavailability of Owner's personnel to operate the Facility in accordance to the Facility's operating manual, the Operator shall endeavour in consultation with the Owner to arrange for such additional personnel as may be necessary to operate the Facility, and the Operator shall be entitled to a Change Order under Article 6. Owner shall be responsible to ensure that the Owner supplied personnel follows instructions and procedures established by Operator for the Work during the Operating Period. Operator shall not be liable for Loss occurring where Owner's Personnel failed to follow the instructions of the Operator.
- 3.1.8 Information. Owner shall provide to Operator, as-built drawings, specifications, diagrams and all other information regarding the Facility under the Construction

Contract as reasonably requested by Operator for the purpose of performing the Work.

- 3.1.9 Electrical Interconnection. Owner shall arrange for the electrical interconnection and for the sale of Electrical Energy produced by the Facility.
- 3.1.10 Storage and Maintenance Facilities. Owner shall provide storage and maintenance facilities, tools, lifting devices and other accommodations necessary for Operator to perform the Work.
- 3.1.11 Authorizations. Owner shall, with Operator's reasonable assistance, obtain and maintain all Authorizations (other than those Authorizations required to be obtained and maintained by Operator under this Agreement), and thereafter comply with all Authorizations and Governmental Rules, required in connection with the operations and maintenance of the Facility and the Work. Owner shall provide, at its cost, reasonable assistance to Operator in obtaining all Authorizations required to be obtained and maintained by Operator and its employees to perform the Work.
- 3.1.12 Communication. Owner shall be responsible for public relations and communications with the community and public agencies.
- 3.1.13 Approvals. Unless indicated otherwise in this Agreement, Owner shall review in a timely fashion and not unreasonably withhold its approval of all items submitted by Operator to Owner for its approval.
- 3.1.14 Owner's Representative. Owner shall notify Operator, in writing, not later than thirty (30) Days following the Effective Date of the proposed individual to act as Owner's Representative. Owner's Representative shall be authorized and empowered to act for and on behalf of Owner in all matters concerning this Agreement.
- 3.1.15 Insurance. Owner shall provide and maintain the insurance coverage set forth in Section 12.2.
- 3.1.16 Directives to Operator's Personnel. Owner shall have no right to direct the activities of any of the Operator's personnel.
- 3.1.17 Taxes. Owner shall pay all Taxes, except for the Operator Taxes.
- 3.1.18 Operator's Personnel. Owner shall respond to the nomination of team leader presented by Operator in accordance with Section 2.3.30 within ten (10) Days. If the Owner does not object to the nomination within ten (10) Days, Owner shall be deemed to have approved such nomination.
- 3.1.19 Operating Media. Owner shall provide LPG, water, cooling water treatment, and lubricating oil which shall meet the requirements as set forth in Appendix 5 for the Wartsila Generator Set. Owner shall be responsible to schedule deliveries, and assure these fluids are supplied timely and properly discharged in corresponding tanks.


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Owner shall be responsible for the quality of such fluids and to make sure that such fluids are in accordance with the specifications set forth in Appendix 5.

- 3.1.20 Back-up Electricity. Owner shall provide for start-up and back-up power when required for the Facility or the Work.
- 3.1.21 Safety Spare Parts, Exchange Spare Parts, and Special Tools. Owner shall store and make available for use by Operator the Safety Spare Parts and Exchange Spare Parts indicated in Appendix 2A during the term of the Agreement. Owner shall store and make available for use by Operator the special tools indicated in Appendix 2C during the term of the Agreement.
- 3.1.22 Substation Transformers and Breakers. Owner shall schedule all services of the substation transformers and breakers following the OEM maintenance recommendations and Owner shall perform the works or subcontract to Operator. The cost of any required spare parts and subcontracted services shall be charged as a Reimbursable Cost to the Owner if supplied by Operator to Owner. Within ninety (90) Days of COD, Owner will arrange for training on the operation of the substation transformers and breakers for Owner's and Operator's personnel. Each Party shall be responsible to pay for the training of their own personnel. Should any annual training or certification be required during the term of the Agreement, it shall be borne by each Party for their own personnel.
- 3.1.23 Safety Equipment. Owner shall provide safety equipment for Owner's Personnel to perform the Work in accordance with Prudent Operating Practices and applicable Governmental Rules and safety standards; and shall replace such protective gear during the term of this Agreement.
- 3.1.24 Not used.
- 3.1.25 Training. Owner shall ensure that the Owner Personnel are available for the required training assessment and scheduled trainings according to the Training Plan.
- 3.1.26 Housekeeping. Owner shall maintain the Facility free and clear from all obstructions, trash and potential fire or electrical hazards.
- 3.1.27 Janitorial Services. Owner shall provide janitorial crew/services for the Facility, including janitorial services for the engine room, workshop, and storage area.
- 3.1.28 Scrap Materials. Owner shall be responsible to remove and dispose the condemned or discarded spare parts.
- 3.1.29 Owner shall provide area for Operator's office container at the Facility near the Wartsila power station. The Owner shall provide electricity, running water, and sewage connection for use by the Operator during the term of this Agreement.


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- 3.1.30 Owner shall purchase the Safety Spare Parts and Exchange Spare Parts listed in Appendix 2A in the amount of One Million Four Hundred Twenty-two Thousand Four Hundred Twenty-Six USD and Forty-Six Cents (\$ 1,422,426.46 USD). Payment of such shall be as per Section 5.6.5

3.2 Equipment Technical Data

Owner consents to the collection and use of information and to the ownership of the derived or incorporating works as set forth herein. Specifically, Owner shall consent to the transmission of equipment technical data through any reasonable means requested by Operator, including internet-connected devices. The term "Equipment Technical Data" refers to all data relating to the technical operating parameters of any equipment delivered, including without limitation, all information that Operator shall gather from sensors, instruments, monitors, or other industrial control or SCADA devices located at the Facility or on the equipment delivered. Equipment Technical Data shall be transmitted to Operator for purposes including, but not limited to, developing its products, solutions and services. Operator, Operator's parent, subsidiaries and/or affiliates shall own all works, products, reports and improvements each may develop based upon, derived from, or incorporating Equipment Technical Data. Equipment Technical Data may be transferred (a) to Operator's parent, subsidiaries and/or affiliates and (b) to third parties who act for or on Operator's behalf for processing in accordance with the non-exclusive purpose(s) listed above or as may otherwise be lawfully processed. Equipment Technical Data may also be disclosed to a third party if Operator is required to do so due to an applicable law, court order or governmental regulation, or if such disclosure is otherwise necessary in support of any criminal or other legal investigation. Operator's rights to use Equipment Technical Data shall survive the termination or expiration of this Agreement, any applicable warranty period and any other commercial contract between the Operator and Owner.

3.3 Cybersecurity Protection

Owner shall ensure that any data or communication delivered to Operator is free of any software virus and malware detectable by Prudent Operating Practice. After the expiration or earlier termination of the Agreement, the Owner shall be responsible for any system integrations and/or system security engineering. After the expiration or earlier termination of the Agreement, it is the Owner's responsibility to protect Critical Components from any External Cybersecurity Threat or Internal Cybersecurity Threat, including against hardware and software vulnerabilities. In recognition of the foregoing, the Owner agrees and covenants that it shall use the degree of care appropriate to prevent unauthorized access, use, or hacking of the Critical Components provided in connection with equipment by Contractor or Operator and shall do so in a manner that is no less rigorous than any recommendations provided by Operator and Owner and accepted industry practices. Operator agrees to collaborate and assist Owner in its compliance with its responsibilities in this paragraph, in accordance with the Prudent Operating Practices.


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ARTICLE 4 RESPONSIBILITY FOR LOSS

4.1 Responsibility for a Loss

Operator shall be responsible to remedy any Operator Loss and Owner shall be responsible for any Owner Loss.

4.2 Notification of a Loss

As soon as reasonably possible after the Operator becomes aware of a Loss, Operator shall notify Owner of the Loss in writing. The notification shall include available details of the Loss, whether the Loss is an Owner Loss or an Operator Loss, the Cost to Remedy and the estimated time to remedy the Loss (the "**Notification of Loss**"). Owner and Operator acknowledge that in the event of a Loss, both Parties shall exert all reasonable efforts to mitigate damages accruing from such Loss.

4.3 Damage Surveyor

In the event Operator finds that a Loss is to be considered an Owner Loss, the Parties shall have the option to, at the latest seven (7) Days from the date of the Notification of Loss, retain a damage surveyor (jointly selected, a "**Damage Surveyor**") with expertise in matters pertaining to the particular type of Loss suffered. Owner and Operator shall jointly cooperate with the Damage Surveyor and any Damage Surveyor appointed by Owner's insurer or the Operator's insurer. The Damage Surveyor and the insurer appointed damage surveyor shall prepare their respective written report (the "**Damage Surveyor Report**") with respect to any Owner Loss, which shall be made available to each of the Parties. The fees of the Damage Surveyor shall be borne by Owner should the event be determined to be an Owner Loss, and by Operator should the event be determined to be an Operator Loss.

4.4 Remedy of an Owner Loss

Within five (5) Days following the delivery to the Parties of a Damage Surveyor Report or within five (5) Days from the Notification of a Loss (in the event the Parties have opted not to utilise Damage Surveyors as set forth in Section 4.3) the Parties shall meet and determine the actions to be undertaken in order to remedy an Owner Loss. The remedy of an Owner Loss shall be implemented as a Change Order.

In the event the Parties are unable to agree upon the remedy of an Owner Loss that affects the Operator's Performance Guarantees, the Performance Guarantees set forth in Appendix 3 shall not apply to the impaired equipment until agreement is reached.

4.5 Major Generator Breakdowns

4.5.1 If the Operator Loss is a Major Generator Breakdown, the Operator's responsibility shall be either of the following ("Recovery Guarantee"):

- (i) repair the damaged Wartsila Generator Set to its former state of serviceability and provide the required spare parts and labour for such repair. The Operator shall also carry out the dismantling and re-erection of the damaged Wartsila


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Generator Set incurred for the purpose of effecting the repairs and carry out ordinary freight to and from a repair shop. Travel costs of Operator's personnel shall be borne by the Operator; or

- (ii) replace the Wartsila Generator Set with new machinery of the same kind and capacity if the Operator deems the Wartsila Generator Set not feasible to repair, and then the item shall be regarded as destroyed. The Operator shall deliver the new equipment on DAP (Incoterms® 2020) basis. The Owner shall be responsible for all freight charges in excess of those freight charges that would normally be charged for the replacement of the Wartsila Generator Set with an identical replacement Wartsila generator set.

4.5.2 Taxes and Duties are excluded and shall be paid by the Owner.

4.5.3 The Operator shall not be responsible for any costs for any repair services undertaken by the Owner. The liability of the Operator under this Recovery Guarantee in respect of any Wartsila Generator Set shall cease if the said item is kept in operation after the Major Generator Breakdown has occurred or if temporary repairs are carried out without the Operator's consent.

4.5.4 Unless otherwise notified by the Operator to the Owner, the title to the replaced Wartsila Generator Set or parts shall transfer to the Operator at no cost to either Party.

4.5.5 The Recovery Guarantee is conditional upon the following:

- (i) That all spare parts for the Wartsila Generator Set are purchased by the Owner from the Operator or any of its Affiliates during the term of this Agreement;
- (ii) That the Owner has not undertaken and has not permitted any party other than the Operator to operate, maintain or repair the Wartsila Generator Set or any part thereof;
- (iii) That the Facility can be remotely monitored by the Operator. For this purpose, the Facility must be equipped with an Expert Insight system during the entire duration of the Agreement and Owner must grant internet access and ensure that the functionality of the Expert Insight system is upheld and maintained in accordance with OEM manuals; and
- (iv) That the Owner complies fully with its other obligations under the Agreement.

If the abovementioned conditions are not complied with by the Owner at any time during the term of this Agreement, the Recovery Guarantee shall become invalid and the Operator shall have no further obligations under the Recovery Guarantee.

4.5.6. The Operator's liability limitations set out in Article 14 of the Agreement shall apply for Operator's responsibilities for Loss; provided, however, that the maximum aggregate

liability set out in Article 14.5 shall not limit the costs of repair or replacement to be undertaken by the Operator under the Recovery Guarantee.

ARTICLE 5 CHARGES FOR SERVICES

5.1 Not Used

5.2 Not Used

5.3 Operating Fee and Recovery Guarantee Payment

The Operating Fee shall be invoiced Monthly, commencing June 1, 2023, through the duration of this Agreement. The Operating Fee consists of: (i) a fixed fee (a "**Fixed Fee**"); (ii) a variable fee for the Wartsila Generating Sets (a "**Variable Fee**"); (iii) an overhaul fee for the 32,000 hour, 36,000 hour, 48,000 hour, services (an "**Overhaul Fee**"), (iv) Reimbursable Costs, and (v) the Recovery Guarantee fee (a "**Recovery Guarantee Fee**").

- (a) The Fixed Fee is Eighty Thousand Eight Hundred Fifteen USD (\$80,815 USD) per Month, or pro-rata thereof for the first and last Month of the Operating Period if the first or last Month of the Operating Period is less than a full Month, as the case may be.

- (b) The Variable Fee is Thirty Eight USD and Thirty One Cents (\$38.31 USD) per Engine Running Hour.

- (c) The Overhaul Fees are broken down to specific overhaul interval per engine (herein referred to as the "Overhaul Fees")

32,000 hour Overhaul Fee	\$741,780 USD per engine event
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36,000 hour Overhaul Fee	\$126,476 USD per engine event
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48,000 Overhaul Fee	\$851,291 USD per engine event
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- (d) Reimbursable Costs are those reasonable and documented costs incurred by Operator in the performance of the Work related to: (i) any and all repair costs for damages arising from Owner's supply of LPG which does not conform to Appendix 5A; (ii) freight and handling charges for spare parts related to an Owner Loss, (iii) any additional work requested by Owner outside the Work performed by Operator, (iv) any office supplies for Operator's office, (v) any Owner-requested tax or external audit, (vi) any special tool required by Operator to perform the Work that have not been provided under the Construction Contract (vii) housing of Operator's personnel, (viii) custom's clearance and local transportation and (ix) any other costs that are designated as Reimbursable Costs in this Agreement. Reimbursable Costs shall be invoiced by Operator to Owner at Operator's external cost plus 8% (except for the housing of Operator's personnel). Housing for up to four (4) Operator's personnel in St. Thomas shall be charged at cost, up to a maximum amount for each of \$3,000 USD per Month.


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- (e) Recovery Guarantee Fee is Fifty Three Thousand Six Hundred Fifty Nine USD (\$53,659 USD) on an annual basis.

Given the time needed to finalize and execute this Agreement and the two (2) Days the Operator demobilized its personnel from the Facility Site, the invoice for the Fixed Fee for the month of July 2023 shall be prorated to twenty-nine (29) Days, and the Variable Fee shall not take into account the Engine Running Hours during those two (2) Days.

5.4 Escalation

The Operating Fees shall be increased according to the indexes and formulas detailed in Appendix 6.

5.5 Payment and Interest

All payments due to Operator under this Agreement shall be made in full and without any set off or deduction. If the Facility is not operational due to suspension of this Agreement under Section 7.7, or Force Majeure under Article 9, the Owner shall pay only the Operator invoices for Works performed up to the date of breach or suspension. All expenses for remitting payments shall be borne by Owner. Payments by Owner to Operator under this Agreement shall be made to the bank account indicated on Operator's Invoice. Any and all payment obligations of Owner may not be transferred to another party without Operator's express written consent.

Payments to Operator received after the invoice is due (including amounts disputed in accordance with Section 5.9, below, which are subsequently determined to be properly due) shall incur interest for each day after the date the invoice is due at the rate of one and one quarter (1.25%) percent per month, compounded monthly, unless the late payment is the subject a dispute that is found to be the result of an invoicing error by the Operator. The late payment resulting from this invoicing error by Operator shall not be subject to interest.

5.6 Payment Procedures

5.6.1 Not Used.

5.6.2 The Operator's invoice for the Operating Fee shall be submitted to Owner within thirty (30) Days after the end of each Month.

All payments by Owner to the Operator shall be made within thirty (30) Days from the date the Operator's invoice was submitted to Owner.

5.6.3 The Operator's invoice for the Overhaul Fees shall be issued in two invoices for any given Overhaul Fee in accordance to the Annual Operating Plan. The first invoice shall be issued sixty (60) days prior to the scheduled maintenance overhaul and shall be the equivalent of thirty five percent (35%) of each Overhaul Fee. The second invoice shall be issued upon completion by Operator of such scheduled maintenance overhaul and shall be the equivalent of sixty five percent (65%) of each Overhaul Fee plus any Reimbursable Cost.


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All Payments by Owner shall be made within forty (40) Days from the date the Operator's invoice was submitted to the Owner.

- 5.6.4 The Operator's invoice for the Recovery Guarantee shall be issued prior to COD and on every anniversary date of COD thereafter.

All Payments by Owner shall be made within thirty (30) Days from the date the Operator's invoice was submitted to the Owner.

- 5.6.5 Owner shall pay for the Safety Spare Parts and Exchange Spare Parts inventory in twelve (12) monthly instalments starting in September 2023.

5.7 Payment Security

Within thirty (30) Days from the Execution Date, the Owner shall deposit with Operator the balance of Sixty One Thousand Nine Hundred Seventy-Three USD (\$61,973 USD), to comprise Four Hundred Seventy-Nine Thousand, Nine Hundred Seventy-Three USD (\$479,973 USD) as a payment security (the "**Owner Payment Security**"). The Operator shall hold the Owner Payment Security in a non-interest bearing account in a bank with minimum Standard & Poor's credit rating of BB+. The Owner Payment Security shall be used by Operator in the event that the Owner does not pay the Operating Fees. If any portion of the Owner Payment Security is used by Operator to pay for Operating Fees, the Owner shall replenish the amount used such that at all times the Payment Security is equal to three (3) months' Operating Fee. At the end of the Agreement term, this payment security shall be used towards the last three (3) months of the Operating Fees, and the Operator shall return any amounts not applied as set forth above to Owner at the end of this Agreement.

5.8 Payment of Performance Liquidated Damages

The Performance Liquidated Damages for each Year shall be determined by the Operator and the Operator shall within thirty (30) days after the end of each six-month period, in which two (2) of the four (4) Quarterly Performance Test are taken in accordance with Section 2.3.26, inform Owner in writing of such determination, with such substantiating detail as is reasonable under the circumstances ("LD Notice"). The calculations for determining the Heat Rate Liquidated Damages and Facility Capacity Liquidated Damages shall be based upon the results of the relevant Performance Test.

In the event Owner does not agree with the Operators determinations in the LD Notice Owner shall notify the Operator in writing within seven (7) days after receipt of the LD Notice, which notice shall include justified reasons for its disagreement. In the event Owner fails to notify the Operator within the above period the Owner shall be deemed to have accepted the determinations in the LD Notice, and Operator shall pay the Performance Liquidated Damages within fifteen (15) calendar days following the LD Notice.

In the event Owner provides notice of its disagreement within the above period and the Parties do not agree upon the determination of Performance Liquidated Damages within thirty (30) days from receipt by the Operator of the Owner's notice of disagreement, each Party shall be entitled to submit the matter to dispute resolution pursuant to Section 15.1.


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5.9 Payment Disputes

In the case of a dispute with respect to a portion of any payment amount, the Operator or Owner, as the case may be, shall pay the undisputed portion in accordance with the provisions of this Agreement. The Operator's or Owner's acceptance of partial payment shall not be deemed to constitute a waiver of its right to receive amounts which are in dispute and the Operator or Owner shall use their best efforts to resolve all disputed amounts as soon as practicable.

In the event of a dispute between the Parties regarding any payments made hereunder, either Party shall have the right to refer the dispute to settlement proceedings in accordance with Section 15.1 of this Agreement.

ARTICLE 6 CHANGE ORDERS

6.1 Change Order

In the event the Operator reasonably determines that there is a requirement for a change in the Work, this Agreement and/or the Operating Fee due to:

- (i) Owner:
 - (a) failing to adhere to its obligations under this Agreement;
 - (b) failing to provide the Owner's Personnel for the operation as provided in Sections 2.2.16 and 2.3.6;
 - (c) making any modifications to the Facility that adversely affects the Operator's performance of the Work hereunder; or
 - (d) requests the Operator to perform any services not covered by the Work;
- (ii) any Owner instructions that have additional cost implications;
- (iii) a Change of Law;
- (iv) an Owner Loss;
- (v) any event of Force Majeure; or
- (v) any Section of this Agreement which provides that a change in the Work shall be implemented as a Change Order,

the Operator shall be entitled to request a change order adjusting this Agreement and/or the Operating Fee and/or the Work and/or other compensation, as the case may be, as set forth in Section 6.2.

In the event that Owner desires to make a change to the Work, Owner may request a change order adjusting the Work (any change order, whether requested by Operator or requested by Owner, is herein referred to as a **"Change Order"**).

6.2 Change Order Procedure

- 6.2.1 If either Party requests to a Change Order, the Operator shall prepare (to the extent applicable) and submit to Owner as soon as practicable (a **"Change Order Proposal"**):
- (i) a description of the proposed Work to be performed and the timelines for its execution and any potential operational impact;
 - (ii) the anticipated change in the Annual Operating Plan, including an estimate of any increase or decrease in the cost projection in the Annual Operating Plan; and
 - (iii) the proposal for adjustment to the Performance Guarantees, Operating Fee, and/or other modifications to this Agreement, accompanied by detailed pricing and documentary evidence if any.
- 6.2.2 Owner shall review the Change Order Proposal with the Operator for the purpose of determining whether to proceed with the Change Order Proposal and, if so, for the purpose of agreeing on the matters set forth therein, including any changes to the Annual Operating Plan, mutually acceptable adjustment to the Performance Guarantees, Operating Fee, and / or the Work. As soon as practicable after receipt of a Change Order Proposal, and in any case within thirty (30) Days after such receipt, Owner shall either approve or disapprove the Change Order Proposal, in writing.
- 6.2.3 A Change Order Proposal shall neither be implemented nor be effective until such time that Owner approves the Change Order Proposal, in writing, as a Change Order.
- 6.2.4 If Owner approves the Change Order in writing, Owner and the Operator shall then, as soon as practicable, sign the Change Order, which shall then operate as an amendment to this Agreement.
- 6.2.5 If a Change Order is pending either the approval of Owner in terms of this Section 6.2 or a determination pursuant to Section 15.1, Owner agrees to indemnify the Operator against any and all losses, claims, expenses, liabilities, damages and costs whatsoever that may arise, to the extent related to the Change Order, while waiting for Owner's approval or determination, as the case may be.

ARTICLE 7 TERM AND TERMINATION

7.1 Term of Contract

This Agreement shall be effective on June 1, 2023 (the **"Effective Date"**) and shall remain in effect for three (3) Years from the Effective Date or until the first generator set reaches 51,000 engine running


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hours (the “**Maximum Running Hour Limit**”) from the COD of the Facility whichever one comes first unless terminated earlier according to this Article 7 (the “**Term**”). Notwithstanding the Effective Date of June 1, 2023, as per correspondence exchanged between the Parties, the Operator had to demobilize its personnel from the Facility Site during July 18 and 19, remobilizing on July 20, 2023. This hiatus shall be taken into account for all purposes of the Agreement, including invoicing.

At any time prior to the expiration of the Agreement, the Parties may agree to extend the term of the Agreement.

If a particular Generator Set reaches its Maximum Running Hour Limit prior to other Generator Sets of the Covered Equipment and prior to the three (3) year term, then the Operator shall continue to provide the applicable Services for such other Generator Sets, but shall cease to provide the Services for the Generator Set that has reached the Maximum Running Hour Limit. The Operator may continue to provide Services on a Generator Set that has reached its Maximum Running Hour Limit upon written acceptance of a Change Order.

If a particular Generator Set does not reach its Maximum Running Hour Limit prior to the three (3) year term, then, provided the Owner provides at least six (6) months prior written notice, the Parties may agree to extend the Agreement for six (6) months. For the avoidance of doubt, the particular time period to which the Agreement is extended shall only affect the particular Generator Set agreed upon by the Parties in which the Covered Equipment does not reach its Maximum Running Hour Limit. If the other Generator Sets will surpass the Maximum Running Hour Limit, the Operator may to provide Services on a Generator Set that has reached its Maximum Running Hour Limit upon written acceptance of a Change Order.

7.2 Termination by Owner

7.2.1 Owner shall have the right to terminate this Agreement:

- (i) if an event of Force Majeure continues for more than one hundred eighty (180) consecutive Days; or
- (ii) upon the occurrence of an Operator Event of Default; or
- (iii) if the Construction Contract is terminated.

7.2.2. If, at any time during the term of this Agreement, one or more of the following events occurs:

- (i) the Bankruptcy of the Operator;
- (ii) a material failure by the Operator to perform any of its obligations in this Agreement;
- (iii) a failure by the Operator to pay any amounts to Owner when due;
- (iv) the Operator or any Affiliate has made a Prohibited Payment; or


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- (v) any representation or warranty made by the Operator shall prove to be incorrect at any time in any material respect,

Owner may give the Operator notice (an "**Operator Default Notice**"), in writing, specifying that such an event has occurred and giving reasonable details of such an event. Upon receipt of the Operator Default Notice, the Operator must, if such event is curable, cure such event within thirty (30) Days of receipt of the Operator Default Notice. If such event is not capable of being cured or has not been cured within thirty (30) Days after the Operator has received that Operator Default Notice, an "**Operator Event of Default**" shall be deemed to have occurred and Owner may terminate this Agreement by written notice to the Operator.

7.3 Termination by Operator

7.3.1 The Operator shall have the right to terminate this Agreement:

- (i) if an event of Force Majeure continues for more than one hundred eighty (180) consecutive Days;
- (ii) upon the occurrence of an Owner Event of Default;
- (iii) if the Construction Contract is terminated; or
- (v) if a suspension as set forth in Section 7.7 persists for a period of more than three (3) Months in aggregate.

7.3.2 If one or more of the following events occurs:

- (i) the Bankruptcy of Owner;
- (ii) a material failure by Owner to perform any of its obligations hereunder;
- (iii) a failure by Owner to pay any material amounts to the Operator when due;
- (iv) Owner fails to provide or replenish the Owner Payment Security; or
- (v) any representation or warranty made by Owner shall prove to be incorrect at any time in any material respect,

Operator may give Owner notice (an "**Owner Default Notice**"), in writing, specifying that such an event has occurred and giving reasonable details of such event. Upon receipt of Owner Default Notice, Owner must, if such event is curable, cure such event within thirty (30) Days of receipt of Owner Default Notice. If such event is not capable of being cured or has not been cured within thirty (30) Days after Owner has received Owner Default Notice, an "**Owner Event of Default**" shall be deemed to have occurred and the Operator may terminate this Agreement with immediate effect by written notice to Owner.

7.4 Payments Upon Termination

- 7.4.1 In the event of termination of this Agreement by the Owner during the term of this Agreement, the Owner shall pay to the Operator the Spare Part Fee as per Section 5.3 (e) unless this fee has already been paid by the Owner for the purchase of the Safety Spare Parts, and such payment shall be made by the Owner to the Operator within thirty (30) Days following the date of termination.
- 7.4.2 In the event of termination of this Agreement pursuant to Section 7.2, the Operator shall be entitled to payment of the Operating Fee up to the date of termination. Such payment shall be made by Owner to the Operator within thirty (30) Days of the date of termination.
- 7.4.3 In the event of a termination pursuant to Section 7.3.1 or Section 7.3.2, Owner shall pay to the Operator, within thirty (30) Days of being invoiced therefor, the amount of the Operating Fee up to the date of termination, the Operator's reasonable demobilization costs and all other amounts due under this Agreement as of the date of termination. Subject to Owner's right to conduct a subsequent audit and review, such amounts shall be due and payable by Owner within 90 days of Operator's submission of an invoice, which invoice shall include a statement of all such costs and expenses.

7.5 Additional Duties of Operator

- 7.5.1 Unless otherwise set forth elsewhere in this Agreement, the Operator shall upon the termination or expiry of this Agreement and subject to receipt in full of all amounts invoiced under this Agreement hand over the Facility to Owner in a condition similar to the condition of the Facility at the Effective Date, subject to fair wear and tear and Operator's maintenance obligations during the term of this Agreement.
- 7.5.2 In the event of termination pursuant to Section 7.2.1 (ii), the Operator shall:
- (i) meet with Owner and agree on the time schedule of hand over, the inventory list, the tool list, the operating documentation over the term of the agreement, performance testing, and performance in accordance with OEM Manuals of any scheduled or unscheduled maintenance due to be performed by Operator as set forth in this Agreement;
 - (ii) at the written request of Owner, continue operating the Facility and performing the Work for a period up to ninety (90) Days and during such period, this Agreement shall (notwithstanding the purported termination of this Agreement by Owner pursuant to Section 7.2.1 (ii)) remain valid, except that any Performance Guarantees shall not apply, and the Owner shall continue to pay the Operator the Operating Fee;
 - (iii) at request of Owner, hand over the Facility to a successor operator;
 - (iv) inspect the Facility and take inventory of equipment, spare parts, tools and consumables; and
 - (v) hand over to Owner the maintenance history of the Facility.

7.6 Termination/Expiration Certificate

The Operator shall, within thirty (30) Days from the date of termination or expiry of this Agreement, sign and submit to Owner two acknowledgements of termination/expiration certificates in accordance with the format as set forth in Appendix 8. Owner shall sign the acknowledgement of termination/expiration certificates and return one signed copy to the Operator within twenty one (21) Days from the Operator's submittal thereof. In the event the Operator has not received a signed acknowledgement of termination/expiration certificate or a rejection within the above mentioned period of time, the acknowledgement of termination/expiration certificate shall be deemed accepted and signed by Owner.

7.7 Suspension by Operator

If (a) Owner fails to pay Operating Fees or any material amounts due under this Agreement and such default shall not have otherwise been cured within thirty (30) Days after Owner's receipt of the Operator's written notice thereof, the Operator may suspend its performance of Work under this Agreement with a written notice to Owner.

Owner shall be responsible for Owner's losses, claims, expenses, liabilities, damages, costs and consequences arising out of or relating to such suspension.

ARTICLE 8 LIQUIDATED DAMAGES

Without limiting Owner's right to terminate pursuant to Section 7.2, Operator shall be liable for the Performance Liquidated Damages set forth in this Section Article 8, which amounts shall be paid as set forth in Sections 5.8 and 5.9, provided, however, that, notwithstanding the provisions of Section 5.5, Owner shall have the right to set-off any amount of Performance Liquidated Damages owed by the Operator against any amounts owed by the Owner to the Operator under this Agreement.

8.1 Performance Liquidated Damages

8.1.1 Annual Availability Liquidated Damages

In the event that the Annual Availability is less than the Annual Availability Guarantee, the Operator shall be liable for payment of liquidated damages to Owner in accordance with Appendix 15.

8.1.2 Heat Rate Liquidated Damages

In the event that the biannual average of the Heat Rate measured on a Quarterly basis, exceeds the Heat Rate Guarantee, the Operator shall be liable for payment of liquidated damages to Owner in accordance with Appendix 15.

8.1.3 Lube Oil Consumption Liquidated Damages

In the event that the Lube Oil Consumption exceeds the annual Lube Oil Consumption Guarantee, the Operator shall be liable for payment of liquidated damages to Owner in accordance with Appendix 15.

8.1.4 Electrical Capacity Liquidated Damages

In the event that the biannual average of the Electrical Capacity measured on a Quarterly basis, is less than the Electrical Capacity Guarantee, the Operator shall be liable for payment of liquidated damages to the Owner in accordance with Appendix 15.

ARTICLE 9 FORCE MAJEURE

9.1 Force Majeure

Neither Party shall be considered to be in default in the performance of any of its obligations under this Agreement, when and to the extent failure of performance shall be due to an event of Force Majeure, provided, however, an event of Force Majeure shall not excuse any failure to pay amounts due under Article 5. For the duration of the Force Majeure, the Operator shall waive any late payment interest as the Owner may not be able to make a payment transaction.

9.2 Obligation to Diligently Cure Force Majeure

If either Party relies on the occurrence of an event of Force Majeure as a basis for being excused from performance of its obligations under this Agreement, then the Party relying on the event or condition shall:

- (i) provide prompt notice to the other Party of the occurrence of the said event of Force Majeure giving an estimation of its expected duration and the probable impact on the performance of its obligations hereunder;
- (ii) exercise all reasonable efforts to continue to perform its obligations hereunder;
- (iii) expeditiously take action to correct or cure the event of Force Majeure excusing performance;
- (iv) exercise all reasonable efforts to mitigate or limit any Loss to the other Party to the extent such action does not adversely affect its own interest; and
- (v) provide prompt notice to the other Party of the cessation of the event of Force Majeure giving rise to its excused performance.

An extension of time for the completion of the Work shall be granted to the Operator to the extent the performance of the Work is delayed by an event of Force Majeure.


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For the avoidance of doubt, in the event the Facility suffers Loss as a result of an event of Force Majeure Owner shall be responsible to remedy such Loss at its own cost and risk.

9.3 Effect of Continued Event of Force Majeure

If an event of Force Majeure continues for a period of more than one hundred eighty (180) consecutive Days, either Party may terminate this Agreement by providing a thirty (30) Day notice of such termination to the other Party; provided that the said thirty (30) Day notice period may run concurrently with such one hundred eighty (180) Day period.

ARTICLE 10 INDEMNIFICATION

10.1 Indemnification by Owner

Owner, on behalf of itself and its successors and assigns, agrees to save, indemnify and hold harmless the Operator against any and all losses, claims, expenses, liabilities, damages and costs whatsoever for: (i) personal injury to or death of any Third Party; and (ii) direct loss or damage to any Third Party property, except in the event such personal injury, death, loss or damage is a direct result of the negligence, Wilful Misconduct, or fraud of Operator or anyone acting on Operator's behalf or under its instructions, in connection with this Agreement and Operator's obligations hereunder.

10.2 Indemnification by Operator

10.2.1 The Operator, on behalf of itself and its successors and assigns, agrees to save, indemnify and hold harmless Owner against any and all losses, claims, expenses, liabilities, damages and costs whatsoever for: (i) personal injury to or death of any Third Party; and (ii) direct loss or damage to any Third Party property but, in either case, only to the extent such personal injury, death, loss or damage is a direct result of negligence, gross negligence or Wilful Misconduct of Operator or anyone acting on Operator's behalf or following Operator's instructions, in connection with this Agreement and Operator's obligations hereunder.

10.2.2 Without limiting the generality of the foregoing and notwithstanding the provision of Section 14.5, Operator agrees to indemnify Owner, up to a maximum of Two Hundred Fifty Thousand USD (\$250,000 USD) annually, for the aggregate of all fines and penalties incurred by Owner during each year of this Agreement, as a result of failure of the Facility to comply with the Emissions Guarantee except for: (a) periods of 160 hours of scheduled maintenance of each Engine; (b) periods of unscheduled maintenance of each Engine for a period not to exceed 200 hours per calendar year; (c) periods of 24 hours of scheduled maintenance of each RTO each year; (d) periods of unscheduled maintenance of each RTO for a period not to exceed 150 hours per calendar year; and (e) to the extent such failure results from Owner's negligence or Wilful Misconduct or an event of Force Majeure or other reason not attributable to the Operator or the Work. For purposes of determining its obligations hereunder, Operator shall have access to all documentation relevant to the fines or penalties, including all correspondence from Governmental Authorities related thereto and all recorded data from continuous emission testing sensors used to monitor emissions produced by the Facility or any of the Wartsila Generator Sets. The parties acknowledge that a Governmental Authority may


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include the fines or penalties indemnifiable to Owner under this Section 10.2.2 with other fines or penalties that are not indemnifiable to Owner in the same citation, notice of violation, penalty assessment or similar document without specifying the amount associated with the Facility or Wartsila Generator Sets. In such event, Owner agrees to attempt (in writing) to obtain from the Governmental Authority an itemization of the fines or penalties being assessed to identify the amount indemnifiable under this Section 10.2.2. In the event Owner cannot obtain such itemization, the parties shall work together cooperatively and in good faith to reasonably determine the amount indemnifiable under this Section 10.2.2. Owner agrees that this indemnification shall be the only remedy to the Owner for failure of the Facility or any of the Wartsila Generator Sets to comply with the Emissions Guarantee.

10.3 Notices

If a Party entitled to indemnification hereunder (the "**Indemnified Party**") intends to seek indemnification under this Article 10 from the other Party (the "**Indemnifying Party**") with respect to any losses, claims, expenses, liabilities, damages and costs, the Indemnified Party shall promptly give the Indemnifying Party written notice of such losses, claims, expenses, liabilities, damages and costs.

The Indemnifying Party shall have no liability under this Article 10 for any losses, claims, expenses, liabilities, damages and costs for which such written notice is not promptly provided, except to the extent the failure to give such notice does not actually prejudice the Indemnifying Party. Likewise, the Indemnifying Party shall have no liability under Article 10.2.2 for any losses, claims, expenses, liabilities, damages and costs, to the extent that the Indemnified Party does not take reasonable efforts to assist the Indemnifying Party to remediate the conditions causing it to fail to meet the Emissions Guarantee.

The Indemnifying Party shall have the right to assume the defence of any such losses, claims, expenses, liabilities, damages and costs with counsel designated by the Indemnifying Party and reasonably satisfactory to the Indemnified Party; provided, however, that if the defendants in any cause of action for such losses, claims, expenses, liabilities, damages and costs include both the Indemnified Party and the Indemnifying Party, and the Indemnified Party shall have reasonably concluded that there may be legal defences available to it which are different from or additional to those available to the Indemnifying Party, the Indemnified Party shall have the right to select separate counsel to assert such legal defences and to otherwise participate in the defence of such losses, claims, expenses, liabilities, damages and costs on behalf of such Indemnified Party.

Should the Indemnified Party be entitled to indemnification under this Section as a result of a claim or action by a Third Party, and should the Indemnifying Party fail to assume the defence of such claim or action, the Indemnified Party may, at the expense of the Indemnifying Party, contest or, with the prior consent of the Indemnifying Party, settle such claim or action.

Except to the extent expressly provided herein, no Indemnified Party shall settle any claim or action with respect to which it has sought or intends to seek indemnification pursuant to this Section 10.3 without the prior written consent of the Indemnifying Party, which consent shall not be unreasonably withheld or delayed.


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10.4 Employees

Neither Party nor its directors, officers, employees, agents, Affiliates or representatives, nor any independent subcontractors engaged by it in connection with the performance of this Agreement, shall be deemed an employee of the other Party. Neither Party shall bring any claim against the other Party or its directors, officers, Affiliates, agents, representatives, employees or independent subcontractors with respect to any liability for compensation under an applicable statute or any applicable Governmental Authority, including worker's compensation and/or employer's liability claims of employees.

10.5 Survival of Obligation

The duty to indemnify under this Article 10 is a continuing obligation separate and independent from the other obligations of each of the Parties, and shall continue in full force and effect notwithstanding the expiration or termination of this Agreement with respect to any liabilities indemnifiable under this Article 10, based on facts or conditions, which occurred prior to such expiration or termination. As previously stated, the duty to indemnify set forth Section 10.2.2 is limited to fines and penalties incurred during the third year of this Agreement.

ARTICLE 11 ENVIRONMENTAL RESPONSIBILITIES

11.1 Environmental Responsibilities of Owner

Subject to Section 11.2, Owner shall be responsible for all costs and expenses associated with the clean-up, removal, and/or remediation of any and all: (i) Hazardous Substances that are required by a Governmental Authority to be cleaned up, removed or remediated; (ii) Hazardous Substances pre-existing at the Facility Site or subsequently brought onto the Facility Site by Owner or any Third Parties; and (iii) Hazardous Substances present at the Facility Site that pose a danger to the safety or health of employees of Owner, the Operator or others lawfully present at the Facility Site, as reasonably determined by the Operator in accordance with Prudent Operating Practices.

11.2 Environmental Responsibilities of Operator

The Operator shall be responsible for, and the Operator shall reimburse Owner for, all reasonable costs associated with the clean-up, removal and/or remediation of any and all Hazardous Substances that were brought onto the Facility Site by the Operator and that were released to the environment, to the extent such release of Hazardous Substances is caused by the Operator.

11.3 Notice of Release, Investigation and Response

If the Operator encounters or discovers at the Facility Site: (i) any materials that it reasonably believes may be Hazardous Substances (excluding any Hazardous Substances brought onto the Facility Site by the Operator) the presence or disturbance of which the Operator reasonably determines may present a threat or danger to human health, safety, or the environment; or (ii) any release of Hazardous


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Substances, it shall promptly notify Owner, and Owner shall undertake an investigation and/or response consistent with applicable Governmental Rules and Authorizations.

ARTICLE 12 INSURANCE

12.1 Operator's Coverage

The Operator shall obtain and maintain in force throughout the term of this Agreement and for each renewal thereafter. The insurance coverage shall be in accordance to Appendix 14.

12.2 Owner's Coverage

Owner shall obtain and maintain in force throughout the term of this Agreement and for each renewal thereafter. The insurance coverage shall be in accordance to Appendix 14.

12.3 Independent Contractor's Coverage

Owner and the Operator shall require all their respective independent contractors and subcontractors to obtain, maintain and keep in force for the time during which they are engaged in performing services in connection with the Facility, reasonable adequate coverage in accordance with Prudent Operating Practice and reasonably acceptable to Owner or the Operator, as the case may be, and to furnish acceptable evidence of such insurance upon request. Owner and the Operator shall have no responsibility for the payment of premiums and claims for such insurance.

12.4 Form and Content of Policies

All policies with respect to insurance maintained by the responsible Parties pursuant to this Article 12 shall:

- 12.4.1 With respect to liability insurance only, state that such insurance is primary, or excess only with respect to the specific primary policy provided by the same Party for such coverage, and not excess or contributing in respect to any other insurance (or self-insurance) available to Owner, the Operator or the additional insured and that all provisions thereof, except the limits of liability, shall operate in the same manner as if there were a separate policy covering each insured under each such policy;
- 12.4.2 Provide that the following cross liability clause is incorporated into each and every liability insurance policy: "In the event of claims being made by reason of: (i) personal and/or bodily injuries suffered by any employee or employees of one insured hereunder for which another insured hereunder is or may be liable; or (ii) damage to property belonging to any insured hereunder for which another insured is or may be liable, then this policy shall cover such insured against whom a claim is made or may be made in the same manner as if separate policies have been issued to each insured hereunder, except with respect to the limits of insurance";
- 12.4.3 Provide that there will be no recourse against any additional insured for the payment of premiums or commissions, or deductibles or, if such policies provide for the


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payment thereof, additional premiums or assessments or deductibles, it being understood that these are obligations of the Party providing such insurance pursuant to this Agreement;

- 12.4.4 Waive any right of subrogation of the insurers against Owner, the Operator and the officers, directors and employees of each of them and any right of the insurers to any set off or counterclaim or any other deduction, whether by attachment or otherwise, in respect of any liability of any such Person insured under such policy;
- 12.4.5 With respect to the coverage under Article 12, include the Operator and Owner as an additional named insureds;
- 12.4.6 With respect to the interest of any additional named insured, provide that such insurance shall not be invalidated regardless of any breach or violation of any warranty, declaration or condition contained in such insurance by the primary named insured or any other named insured; and
- 12.4.7 The insurance policies for the all risk property and machinery breakdown insurance shall contain an obligation on the insurance provider to inform the Operator of any expiry, cancellation or changes to such insurance policies.

12.5 Certificates

Thirty (30) Days after the Execution Date of this Agreement Owner and the Operator shall each furnish to the other, certificates of insurance, issued by the insurance companies providing the relevant insurances, evidencing the insurance required pursuant to this Agreement.

12.6 Deductibles and Claims Management

- 12.6.1 Claims Management: In the event of a Loss, Owner and the Operator shall first take all reasonable steps to recover the costs associated with such Loss through the appropriate insurance policies.
- 12.6.2 Insurance Deductible: Owner and the Operator shall each be responsible for the deductibles applicable with respect to the insurance policies that each is required to obtain and maintain pursuant to Sections 12.1 and 12.2.

ARTICLE 13 REPRESENTATIONS AND WARRANTIES

13.1 Representations by Operator

The Operator represents and warrants to Owner as follows:

- 13.1.1 Organization. The Operator is a corporation established under the laws of Puerto Rico, and the execution, delivery and performance of this Agreement have been duly authorised by all necessary corporate action and will not violate any provisions of any applicable laws, its by-laws or charter. This Agreement has been duly executed and


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delivered by the Operator and constitutes a legal, valid and binding obligation of the Operator, enforceable in accordance with its terms, except as such enforceability may be limited by Bankruptcy, insolvency, or other similar laws affecting the enforcement of creditors' rights generally, from time to time in effect, and by general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law).

- 13.1.2 No Violation of Law. The Operator is not in violation of any applicable law or judgment entered by any Governmental Authority, which violations, individually or in the aggregate, would affect the Operator's ability to perform its obligations under this Agreement.
- 13.1.3 Litigation. The Operator is not a party to any legal, administrative, arbitral, investigatory or other proceeding or controversy pending, or, to the best of the Operator's knowledge, threatened, that would adversely affect the Operator's ability to perform under this Agreement.

13.2 Representations by Owner

Owner represents and warrants to the Operator as follows:

- 13.2.1 Organization. Owner is an autonomous governmental instrumentality established under the laws of the US Virgin Islands, and the execution, delivery and performance of this Agreement have been duly authorised by all necessary corporate action and will not violate any provisions of any applicable laws or organizational documents. This Agreement has been duly executed and delivered by Owner, and constitutes a legal, valid and binding obligation of Owner, enforceable in accordance with its terms, except as such enforceability may be limited by Bankruptcy, insolvency, or other similar laws affecting the enforcement of creditors' rights generally, from time to time in effect, and by general principles of equity (regardless of whether such enforceability is considered in a proceeding in equity or at law).
- 13.2.2 No Violation of Law. Owner is not in violation of any applicable law or judgment entered by any Governmental Authority, which violations, individually or in the aggregate, would affect Owner's ability to perform its obligations under this Agreement.
- 13.2.3 Litigation. Owner is not a party to any legal, administrative, arbitral, investigatory or other proceeding or controversy pending, or, to the best of Owner's knowledge, threatened, that would adversely affect Owner's ability to perform under this Agreement.
- 13.2.4 Ownership, Compliance and other contracts. Owner has full and unencumbered ownership and is in legal possession of the Facility. The execution and delivery of this Agreement by Owner and the performance of its obligations hereunder will not


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constitute or result in any breach of, default under or violation of any agreement to which it's a party.

13.3 Warranty by Operator at Expiration or Termination

The terms of this Section 13.3 will only apply for the period of time commencing on the date of expiration or termination of this Agreement and ending as per Section 13.3.3 for parts and Section 13.3.4 for labor thereafter (the "Warranty Period"). The Parties acknowledge and agree that the Performance Guarantees shall not apply, and Liquidated Damages shall not be caused, during the Warranty Period.

- 13.3.1 **Operator's Warranty.** The Operator shall repair or replace, in its sole discretion, in whole or in part, defective Parts within the Operator's scope of supply which appear during the Warranty Period. The Operator shall immediately take appropriate steps to prevent any defect from becoming more serious, and file with supplier all warranty claims with respect to this warranty in writing without delay and not later than fourteen (14) Days following discovery of such defect during the warranty period.
- 13.3.2 **Replaced Parts.** Replaced Parts shall be destroyed by Owner, or by Operator if so authorized by Owner. If the Operator requests the Parts for further investigation, Owner shall not reasonably deny the request and Operator shall bear the cost for the shipment. The Operator shall bear the costs of repairing or replacing the defective Parts as well as the costs occasioned by the transport of the defective and of the repaired or replaced Parts between the Operator and the place of delivery as originally agreed in the delivery terms.
- 13.3.3 **Warranty Period for Parts.** The warranty period for the Parts provided by the Operator begins on the date of delivery and ends twelve (12) Months from the date when the Part is placed in service or eighteen (18) Months from the date of delivery, whichever occurs later. For the Safety Spare Parts purchased at the end of term of this Agreement, the warranty of the Safety Spare Parts begins on the date expiration or termination of the Agreement and end twelve (12) Months from the date when the Part is placed in service or eighteen (18) Months from the date of delivery, whichever occurs later. The warranty period in respect of Parts which have been repaired or replaced under warranty shall expire six (6) Months following the date when: (i) the repaired or replacement Part is placed in service; or (ii) upon expiration of the warranty period applicable to the originally supplied Parts, whichever is later. Notwithstanding any provision to the contrary in this Agreement, the warranty period of any Part will not extend beyond the eighteen (18) Months from the date when the Part is placed in service.
- 13.3.4 **Warranty Period for Labor.** The warranty period for labor begins on the date of delivery and ends six (6) months from the last day of performance of the applicable labor. The warranty period in respect to labor which has been re-performed under warranty shall expire six (6) months following the last day on which the labor was re-performed under warranty. Notwithstanding any provisions to the contrary in this Agreement, the warranty period of any labor will not extend beyond twelve (12) Months from the date of original warranty for the labor.


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13.3.5 WARRANTY EXCLUSIONS. THIS WARRANTY DOES NOT COVER ANY DEFECT DUE TO OR CONNECTED WITH THE FOLLOWING: (I) MATERIALS, COMPONENTS, TOOLS, OR DESIGNS PROVIDED BY THE OWNER OR ON BEHALF OF THE OWNER; (II) NEGLIGENCE OR OTHER IMPROPER ACTS OR OMISSIONS TO THE EXTENT CAUSED BY THE OWNER, ITS EMPLOYEES OR AGENTS OR OTHER THIRD PARTIES; (III) INSTALLATION, SERVICE, OPERATION, OR ALTERNATIONS DONE BY THE OWNER NOT CONFORMING TO THE OPERATOR'S OR SUBCONTRACTOR'S MANUALS, INSTRUCTIONS, OR SPECIFICATIONS, OR OTHERWISE NOT IN ACCORDANCE WITH PRUDENT OPERATING PRACTICE; (IV) PARTS, ACCESSORIES, OR OTHER ATTACHMENTS THAN THOSE SUPPLIED BY THE OPERATOR; (V) NORMAL WEAR AND TEAR; OR (VI) IMPROPER SERVICE WORK CARRIED OUT BY THE OWNER.

THE WARRANTY OBLIGATION DOES NOT INCLUDE ANY ELECTRICITY, SCAFFOLDING, ASSISTING WORK, OR CRANAGE. FURTHERMORE, THIS WARRANTY OBLIGATION DOES NOT INCLUDE ANY EXCLUDED EQUIPMENT, UNLESS THE OPERATOR EXPRESSLY AGREED IN WRITING WITH THE OWNER TO PROVIDE A SCOPE OF SUPPLY OF CERTAIN PARTS RELATED TO THE EXCLUDED EQUIPMENT.

13.3.6 The Owner is responsible for the provision of free, effective and safe access to the portions of the Facility where such warranty is applicable. All removal, cutting or similar modification of the Facility structures are the responsibility of the Owner.

13.3.7 THE EXPRESS WARRANTIES EXPLICITLY MADE BY OPERATOR IN THIS AGREEMENT ARE THE ONLY WARRANTIES PROVIDED BY THE OPERATOR APPLICABLE TO WORK TO BE PROVIDED HEREUNDER AND ARE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER WARRANTY OR GUARANTEE EXPRESSED OR IMPLIED AGAINST DEFECTS, LATENT OR OTHERWISE AND THE OWNER HEREBY WAIVES ANY CLAIM THEREUNDER. THE OPERATOR NEITHER ASSUMES, NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT, ANY OTHER WARRANTY OBLIGATION IN CONNECTION WITH THE WORK PROVIDED HEREUNDER OR ANY PART THEREOF.

ARTICLE 14 LIMITATION AND EXCLUSIONS OF LIABILITY

14.1 General

Notwithstanding anything else to the contrary stated in this Agreement the following limitations of the Operator's liability in this Article 14 shall apply.

14.2 Exclusion of Consequential Loss

IN NO EVENT, WHETHER AS A RESULT OF BREACH OF CONTRACT, BREACH OF WARRANTY, TORT (INCLUDING NEGLIGENCE AND STRICT LIABILITY) OR OTHERWISE, AND WHETHER ARISING BEFORE, DURING OR AFTER THE EFFECTIVE DATE, SHALL EITHER PARTY BE LIABLE FOR ANY INDIRECT, CONTINGENT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL LOSS OR DAMAGE INCLUDING, WITHOUT LIMITATION AND WITHOUT BEING LIMITED BY THE MEANING OF "INDIRECT", "CONTINGENT", "SPECIAL", "CONSEQUENTIAL" OR "INCIDENTAL", ANY LOSS OF ACTUAL OR ANTICIPATED PROFITS


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OR REVENUE OR ANY FAILURE TO REALISE ANTICIPATED SAVINGS, LOSS OF OPPORTUNITY, BUSINESS OR BUSINESS OPPORTUNITIES, ANY PENALTIES PAYABLE UNDER AGREEMENTS OTHER THAN THIS AGREEMENT, LOSS OF GOODWILL, LOSS OF PRODUCTION, LOSS OF USE, WASTED OVERHEADS, PUNITIVE OR EXEMPLARY DAMAGES, OR FOR LOSS OF TIME OR USE OF ANY EQUIPMENT, INSTALLATION SYSTEM, OPERATIONS OR SERVICE INTO WHICH PARTS MAY BE PUT, OR WITH RESPECT TO WHICH ANY SERVICES MAY BE PERFORMED BY THE OPERATOR, HOWEVER CAUSED OR ARISING, INCLUDING ARISING IN CONTRACT, TORT (INCLUDING FOR NEGLIGENCE OR STRICT LIABILITY), UNDER STATUTE OR ON ANY OTHER BASIS IN LAW OR EQUITY.

THIS LIMITATION ON LIABILITY SHALL APPLY (WITHOUT LIMITATION) TO ANY LIABILITY FOR DEFAULT UNDER OR IN CONNECTION WITH THE EQUIPMENT, HARDWARE, GOODS, PARTS AND/OR SERVICES DELIVERED HEREUNDER, WHETHER BASED ON WARRANTY, FAILURE OF OR DELAY IN DELIVERY OR OTHERWISE.

14.3 Foreseeability

Without prejudice to the generality of Section 14.2, in no event, whether as a result of breach of contract, breach of warranty, tort (including negligence or strict liability) or otherwise, and whether arising before, during or after completion of the Work, shall either Party be liable for any Loss or damage as could not have been reasonably foreseeable by it at the Effective Date as determined by the arbitration panel.

14.4 Limitation of Liability for Liquidated Damages

During the Term, the Performance Liquidated Damages payable shall be limited to, and shall in no event exceed Twenty percent (20%) of the Annual Turn Over of such operating Year and shall be subject to the Section 5.8.

The liquidated damages set forth in Section 8.1 shall be the sole and exclusive remedy of Owner and the Operator's only liability with respect to any failure by the Operator to achieve the Performance Guarantees. Owner waives any right to request the Operator to achieve the Performance Guarantees where failure to reach such Performance Guarantees triggers the payment of Performance Liquidated Damages.

14.5 Maximum Aggregate Liability

NOTWITHSTANDING ANY OTHER PROVISION OF THIS AGREEMENT AND SUBJECT TO THE QUALIFICATION ON THE MAXIMUM AGGREGATE LIABILITY SET OUT IN SECTION 4.5.6, THE OPERATOR'S MAXIMUM AGGREGATE LIABILITY TO OWNER OR ITS EMPLOYEES, REPRESENTATIVES OR THEIR AFFILIATES PURSUANT TO OR ARISING OUT OF THIS AGREEMENT WHETHER ARISING FROM BREACH OF CONTRACT, LIQUIDATED DAMAGES, OPERATOR LOSS, IN TORT (INCLUDING NEGLIGENCE OR STRICT LIABILITY), BREACH OF CONTRACT, INDEMNITIES OR ANY OTHER CAUSE OF ACTION (EXCEPT FOR INSTANCES OF WILFUL MISCONDUCT), SHALL BE LIMITED TO AND SHALL IN NO EVENT EXCEED THIRTY PERCENT (30%) OF THE ANNUAL TURNOVER.

14.6 Cybersecurity Limitation of Liability

AFTER THE EXPIRATION OR EARLIER TERMINATION OF THE AGREEMENT, WITH REGARD TO SECTION 3.3, OPERATOR AND/OR CONTRACTOR SHALL NOT BE LIABLE FOR ANY HARM, INJURY OR DAMAGES DUE TO OR ARISING IN CONNECTION WITH: (1) SOFTWARE PROVIDED BY OWNER; (2) SYSTEMS OTHER THAN THOSE PROVIDED BY OPERATOR OR CONTRACTOR; OR (3) IMPROPER SERVICE WORK, INSTALLATION OR ALTERATIONS CARRIED OUT BY OWNER.

14.7 Claims Time Barred

Any and all claims by Owner for an alleged negligent act, error or omission by the Operator in the conduct and execution of the Work shall be presented by Owner to the Operator in writing, immediately upon discovery or as soon as is reasonably practicable and in no event later than 180 days after its discovery by Owner.

The liability of the Operator shall in all cases expire three (3) Years after expiration or termination of this Agreement, whichever occurs earlier.

14.8 Validity of Disclaimers

Releases, disclaimers and limitations on liability expressed herein shall apply even in the event of the fault (other than Wilful Misconduct) of the party whose liability is released, disclaimed or limited to the extent provided in such release, disclaimer and limitation, such fault to include the negligence, strict liability or breach of contract (including other legal bases of responsibility such as fundamental breach).

All releases, waivers, or limitations of liability given by Owner in favour of the Operator expressed in this Agreement shall apply equally to any Affiliate of the Operator.

14.9 Exclusive Remedy

Owner's rights and remedies, whether for breach of contract, breach of warranty, tort or otherwise are exhaustive as set out in this Agreement.

The express warranties and guarantees set forth in this Agreement replaces any other warranties and guarantees express or implied including any other warranties and guarantees, against vices, non-conformity or defects, hidden or otherwise, and any other obligation, term or liability whether in contract or in law and Owner hereby waives all other remedies, warranties and guarantees expressed or implied, arising by law or otherwise (including without limitation any obligations of the Operator with respect to any fitness for purpose and merchantability).

14.10 Owner's Acknowledgement of Limitation on Operator's Liability

Owner acknowledges and agrees that the charges for services charged by the Operator are based upon Owner's acceptance of and agreement to the exclusions of and limitations to the Operator's liability under this Agreement and on Owner effecting and maintaining appropriate and adequate insurance under this Agreement, and that such fees would be significantly higher in the absence of such


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exclusions and/or limitations, and/or such insurance obligations. Accordingly, Owner agrees that the exclusions and limitations of liability set out in this Agreement are fair and reasonable.

14.11 Invalidity

If any provision of this Article 14 is held by any court or other competent authority to be illegal, invalid, void or unenforceable in whole or part, the remainder of this Article 14 shall continue to be valid as to the other provisions thereof and the remainder of the affected provision. The Parties shall replace or amend any illegal, invalid, void or unenforceable provision with a legally acceptable alternative that meets or most closely meets the original intention of the Parties.

ARTICLE 15 MISCELLANEOUS

15.1 Arbitration

In the event of any dispute, controversy or claim arising out of or in connection with this Agreement, including any questions regarding its existence, validity, termination or a breach thereof, the Parties agree to submit the matter to settlement proceedings under the International Chamber of Commerce Alternative Dispute Resolution ("**ADR**") Rules, which rules are deemed to be incorporated by reference into this Section. If the dispute has not been settled pursuant to the said rules within forty-five (45) Days following the filing of a request for alternative dispute resolution or within such other period as the Parties may agree in writing, such dispute shall be finally settled in an arbitration proceeding under the current Rules of Arbitration of the International Chamber of Commerce, by one (1) or more arbitrators appointed in accordance with the said Rules of Arbitration, which rules are deemed to be incorporated by reference into this Section.

The language of the ADR and arbitration shall be English and all documents submitted in connection with such proceedings shall be in the English language or, if in another language, accompanied by a certified English translation.

The seat of the ADR and arbitration shall be in St. Thomas, U.S. Virgin Islands.

15.2 Governing Law

This Agreement and any non-contractual obligations arising out of or in connection with it shall be governed by, and construed in accordance with, the laws of the State of New York without reference to its conflict of laws principles.

15.3 Severability

The invalidity, in whole or in part, of any of the foregoing Articles, Sections or paragraphs of this Agreement will not affect the validity of the remainder of such Articles, Sections or paragraphs.

15.4 Entire Agreement

This Agreement, including Appendices and all amendments thereto, contain the complete agreement between Owner and the Operator with respect to the matters contained herein and supersedes and


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extinguishes any previous or contemporaneous agreements, undertakings and arrangements, whether written or oral, with respect to the matters contained herein. Each Party confirms that in entering into this Agreement it has not relied on any representation, warranty, assurance, covenant, indemnity, undertaking or commitment which is not expressly set out in this Agreement.

15.5 Contract Documents

In the event of any conflict or ambiguity between the body of this Agreement and any of the Appendices hereto the relevant provisions shall be construed as complementary rather than conflicting or ambiguous wherever possible, but if a complementary construction is not possible, then the terms and provisions of the body of this Agreement shall take precedence over the Appendices. In the event of any conflict or ambiguity between the Appendices hereto the Operator shall advise which Appendix shall prevail taking due consideration of Prudent Operating Practices.

15.6 Assignment

Neither Party may assign this Agreement nor any of its obligations, including payment obligations, contained herein without the other Party's written consent, provided that the Operator shall have the right to assign and novate its rights and obligations to any Affiliate with prior notification.

Either Party must notify the other Party in writing if such Party will undergo a change in ownership, merger, consolidation, or similar corporate change.

15.7 Amendment

No modification, amendment, or other changes shall be binding on any Party unless a consent have been given in writing by both Parties.

15.8 Notices

All notices required or provided for in this Agreement shall be in writing and shall be delivered by hand or sent by a recognized overnight mail or courier service with delivery receipt requested as follows:

If to Owner:

US Virgin Islands Water and Power Authority

Attn. Executive Director

Tel: +1 (340) 774-3552

Attn. General Counsel

legaldepartment@viwapa.vi

Address:

9720 Estate Thomas

St. Thomas, USVI 00801

If to the Operator:


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Wärtsilä Caribbean, Inc.

Attn: Contract Manager

Tel: +1.787.701.2288

Address:

Rd. 887 Km. 0.6

Barrio Martin Gonzalez

Julio N Matos Industrial Park

Carolina, PR 00987

With copy to:

Wärtsilä North America, Inc.

11710 N. Gessner Road, Suite A

Houston, TX 77064

Attention: Samuel Chrysostomo, Legal Counsel

Email: Samuel.chrysostomo@wartsila.com

Notices shall be effective when received by the Party to whom the notices are addressed.

15.9 Waiver

Failure by either Party to exercise any of its rights under this Agreement shall not constitute a waiver of such rights. Neither Party shall be deemed to have waived any right resulting from any failure to perform by the other Party unless it has specifically waived such right in writing.

15.10 Counterparts

This Agreement may be executed in one or more counterparts each of which shall be deemed an original and all of which shall be deemed one and the same Agreement.

15.11 Non-Solicitation

Neither Party shall, during the term of this Agreement, and for one year after the end of its Term, directly or indirectly solicit or offer employment or any other form of contract for services to any of the other Party's technical and/or professional employees, associates, subcontractors or other such personnel who were directly involved in the performance of this Agreement. In the event of a breach of this Section by Owner or the Operator, respectively, the Party in breach shall pay compensation to the other Party equal to six (6) Months' gross salary or fees of the employee, associate, contractor or subcontractor in question.

15.12 Confidentiality

Both parties agree: (i) that the receiving party and its employees may disclose Confidential Information to others if required by law or with the prior written consent of the disclosing party; (ii) not to make use of Confidential Information other than for the performance of this Agreement; and (iii) that it will not use such information for its own advantage to the detriment of the disclosing party or its


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customers. Confidential information shall not include information which: (i) becomes generally available to the public (other than by the acts or omissions of the receiving party or its employees); (ii) was known prior to the date of this Agreement by “or becomes known to” the receiving party or its employees and was not obtained from any person under any obligation of confidentiality to the disclosing party, (iii) is independently developed by the receiving party; or (iv) is required to be disclosed pursuant to legal process or regulation.

15.13 No Transfer of Intellectual Property Rights

All drawings, documents, computer software and engineering and other data furnished or to be furnished by the Operator in connection with this Agreement shall remain the Operator's property. However, the Operator hereby grants to Owner a royalty free license during the term of this Agreement to retain and use all drawings, documents, computer software and engineering data for the sole and exclusive purpose of performing its obligations under this Agreement

15.14 No Third Party Beneficiaries

This Agreement is intended solely for the benefit of the Parties. Nothing in this Agreement shall be construed to create any duty to, standard of care with reference to, any liability to, or any right of suit or action in, any Person or other legal entity not a party to this Agreement.

15.15 Non-Recourse

Neither Party shall have recourse hereunder, and no claim shall be made, against any director, officer, shareholder or Affiliate of the other Party, in such capacity, under this Agreement, and each Party's sole recourse in the event of a breach hereunder by the other Party shall be against the breaching Party's assets, irrespective of any failure to comply with the applicable law or any provision of this Agreement. Neither Party shall have any right of subrogation to any claim of the other Party for any equity contributions to such Party from any shareholder of such Party. This acknowledgment and agreement are made expressly for the benefit of the directors, officers, shareholders and Affiliates of the Parties.

15.16 Title

Title to spare parts or equipment supplied by the Operator under this Agreement shall remain with the Operator until the spare parts or equipment have been put into operation in the Facility. Specific to the spare parts provided in the Overhaul Fees, the title shall remain with the Operator until the associated Overhaul Fee has been paid in full.

15.17 Import and Export Restrictions

15.17.1 The Services shall be delivered, and the Operator’s obligations hereunder shall be, subject to all current and future economic, trade, financial or other sanctions or embargoes and export control laws, regulations and approvals thereto enacted from time to time by the European Union, United Nations or United States of America, or by any other government or international organization whose jurisdiction can be extended to the Operator, its parent company, subsidiaries or Affiliates (collectively, “Export Controls”). The Owner acknowledges


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that the Services and all related technical information, documents and materials may not be re-exported, trans-shipped, diverted or transferred, directly or indirectly, contrary to such Export Controls.

15.17.2 The Owner represents and warrants that anything delivered by the Operator in connection with the Services ("Operator Deliverables") will be used solely for the intended peaceful purpose specified by the Owner to the Operator before entry into this Agreement. In particular, the Owner represents and warrants that any Operator Deliverables will not be used for purposes associated with (i) any activity prohibited or otherwise regulated by the Export Controls; (ii) any chemical, biological, nuclear weapons or missiles capable of delivering such weapons; or (iii) support of any terrorist activity or any other military end use. Further, the Owner warrants and represents that the Operator Deliverables or any part thereof shall not be re-sold if it is known or suspected that it is intended to be used for such purposes. The Owner hereby agrees to and shall cooperate with any verification audit/on-site inspection at the location of the Services as requested by the Operator to verify compliance with Export Controls. The Owner agrees that it shall provide, within fourteen (14) days of the Operator's request, an end-user certificate in form and substance acceptable to the Operator, duly signed for and on behalf of the end-user. If the Operator has not received such end-user certificate within fourteen (14) days of the request, the Operator shall have the right to suspend the performance of the Agreement until it receives the end-user certificate. In such case, Section 7.7 shall apply.

15.17.3 The Operator shall have the right to terminate this Agreement (i) if the performance of this Agreement would either (a) violate any Export Controls or (b) expose the Operator or its parent company, subsidiaries or Affiliates to any sanction, restriction or other adverse consequence under or in connection with Export Controls; or (ii) if the Operator has not received a duly signed end-user certificate in form and substance acceptable to the Operator within thirty (30) days of the Operator's first request for such certificate. In such a case, the provisions of Sections 7.4 and 15.17.4 shall apply.

15.17.4 In the event of termination pursuant to Section 15.17.3, the Operator shall be entitled to receive from the Owner, in addition to anything stated in Section 7.4:

- a) payment for Services actually performed prior to termination for which the Operator has not already received payment, plus reasonable overhead in connection with such Services;
- b) to the extent not already received, the profit that the Operator would have made in connection with such Services; and
- c) all other reasonable costs and expenses incurred by the Operator by reason of the cancellation of the Services, including, without limitation, amounts payable to subcontractors.


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Payment of the foregoing amount shall be made by the Owner to the Operator within thirty (30) days after receipt of the Operator's invoice, accompanied by reasonable documentation in support thereof.

15.18 Conflicting Provisions

In the event of any conflict, inconsistency, or variations between this Agreement and any of the Appendices hereto, the terms and provisions of this Agreement shall have precedence.

15.19 Good Faith and Fair Dealing

15.19.1 The Parties shall act reasonably and shall perform their obligations hereunder in accordance with the principles of good faith and fair dealing.

15.19.2 The provisions of this Agreement, as well as any statements made by the Parties in connection with it, shall be interpreted in good faith.

15.20 Surviving Obligations

Except as otherwise provided, the rights and obligations of the Parties under Article 10 (Indemnification), Article 11 (Environmental Responsibilities), Article 13 (Representations and Warranties) Article 14 (Limitation of Liability), Article 15 (Miscellaneous, including Governing Law, Conflict Avoidance and Dispute Resolution, Confidentiality, Intellectual Property Rights, and Notices) shall survive the termination of this Agreement.

[Remainder of this Page is Intentionally Left Blank]

IN WITNESS WHEREOF the Parties have entered into this Agreement as of the date first written above.

US Virgin Islands Water and Power Authority

Wärtsilä Caribbean, Inc.

(Owner)

(Operator)

By:

Andrew L. Smith
Andrew L. Smith (Sep 5, 2023 17:14 EDT)

By:

Daphne Ly Mendez
daphne ly melendez (Aug 30, 2023 12:05 EDT)

Name: ANDREW L. SMITH

Name: DAPHNE LY MENDEZ

Title: Executive Director (CEO)

Title: Managing Director

Date: 05/09/2023

Date: 30/08/2023

By:

Dionne G. Sinclair

By:

Name: Dionne G. Sinclair

Name:

Title: General Counsel

Title:

Date: 30/08/2023

Date:

Appendices

Shared Operations and Maintenance Agreement

Between

US Virgin Islands Water and Power Authority

And

Wartsila Caribbean, Inc.

SC-02-24

June 1, 2023

APPENDIX 1 FACILITY DESCRIPTION

Appendix 1.A	Battery Limits
Appendix 1.B	Single Line Diagram with Interconnection Point
Appendix 1.C	Location of Project Site and Facility

APPENDIX 1.A

BATTERY LIMITS

Wartsila 34LPG Power Station.

Battery limits of this contract is the Wartsila 20V34LPG Power Plant (21 MW and corresponding auxiliary equipment) operating on LPG as primary fuel.

The Wartsila 20V34LPG Power Plant provides power to the national grid through one (1) substation Step up transformer 13.8 kV / 34.5 kV and corresponding electrical equipment to operate this substation.

[Place holder for drawing DBAE193172_N]

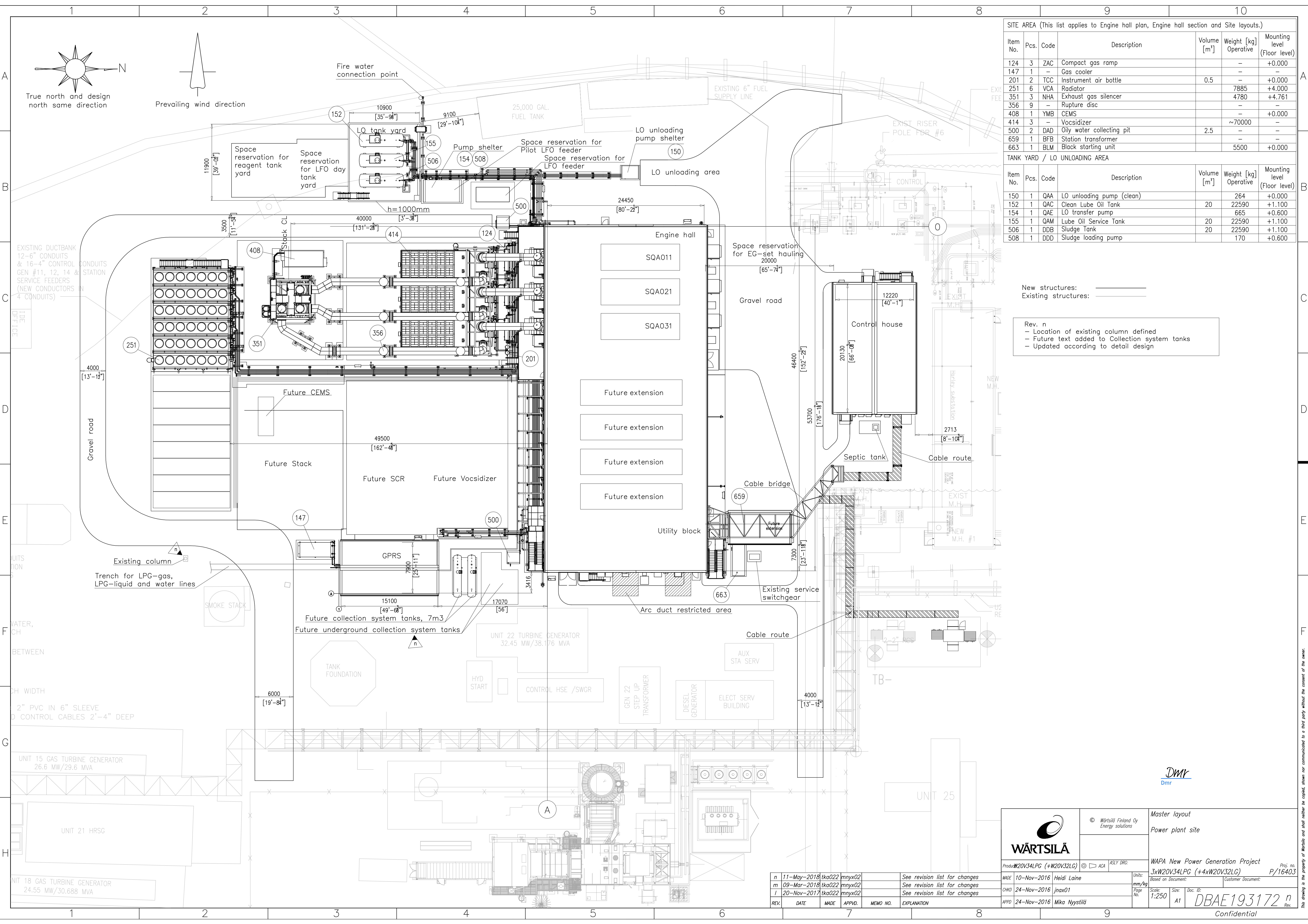
The table below establishes the engine type(s), engine serial number, cylinder configuration, assumed Running Hours as of the Effective Date, and the Maximum Running Hour Limit.

The engine serial number is a unique number and is used to identify specific components for a particular engine.

The Wartsila 20V34LPG engines are expected to run an average of eight thousand (8,000) Running Hours per Year per engine during the Term of the Agreement.

The Running Hours as of the Effective Date indicate the starting point of the Work for the covered equipment.

Covered Equipment Type	Covered Equipment Serial Number	Cylinder Configuration	Assumed Running Hours (ARH)	Maximum Running Hours (MRH)
Wartsila 34LPG	PAAE327456	20V	31365	55365
Wartsila 34LPG	PAAE327457	20V	30925	54925
Wartsila 34LPG	PAAE327458	20V	29224	53224



SITE AREA (This list applies to Engine hall plan, Engine hall section and Site layouts.)						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
124	3	ZAC	Compact gas ramp		—	+0.000
147	1	—	Gas cooler		—	—
201	2	TCC	Instrument air bottle	0.5	—	+0.000
251	6	VCA	Radiator		7885	+4.000
351	3	NHA	Exhaust gas silencer		4780	+4.761
356	9	—	Rupture disc		—	—
408	1	YMB	CEMS		—	+0.000
414	3	—	Vocsidizer		~70000	—
500	2	DAD	Oil water collecting pit	2.5	—	—
659	1	BFB	Station transformer		—	—
663	1	BLM	Block starting unit		5500	+0.000
TANK YARD / LO UNLOADING AREA						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
150	1	QAA	LO unloading pump (clean)		264	+0.000
152	1	QAC	Clean Lube Oil Tank	20	22590	+1.100
154	1	QAE	LO transfer pump		665	+0.600
155	1	QAM	Lube Oil Service Tank	20	22590	+1.100
506	1	DDB	Sludge Tank	20	22590	+1.100
508	1	DDD	Sludge loading pump		170	+0.600

New structures: _____
Existing structures: _____

- Rev. n
- Location of existing column defined
 - Future text added to Collection system tanks
 - Updated according to detail design

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© Wärtsilä Finland Oy
Energy solutions

Master layout
Power plant site

Prod:W20V34LPG (+W20V32LG) ASLY DRG:

MADE 10-Nov-2016 Heidi Laine

CHKD 24-Nov-2016 jnax01

APPD 24-Nov-2016 Mika Nyystilä

Proj. no.
WAPA New Power Generation Project
3xW20V34LPG (+4xW20V32LG)
P/16403

Customer Document:

Units:
mm/kg

Scale:
1:250

Size:
A1

Doc. ID:
DBAE193172 n

Confidential

REV.	DATE	MADE	APPRD.	MEMO NO.	EXPLANATION
n	11-May-2018	tka022	mnxx02		See revision list for changes
m	09-Mar-2018	tka022	mnxx02		See revision list for changes
l	20-Nov-2017	tka022	mnxx02		See revision list for changes

This drawing is the property of Wärtsilä and shall neither be copied, shown nor communicated to a third party without the consent of the owner.

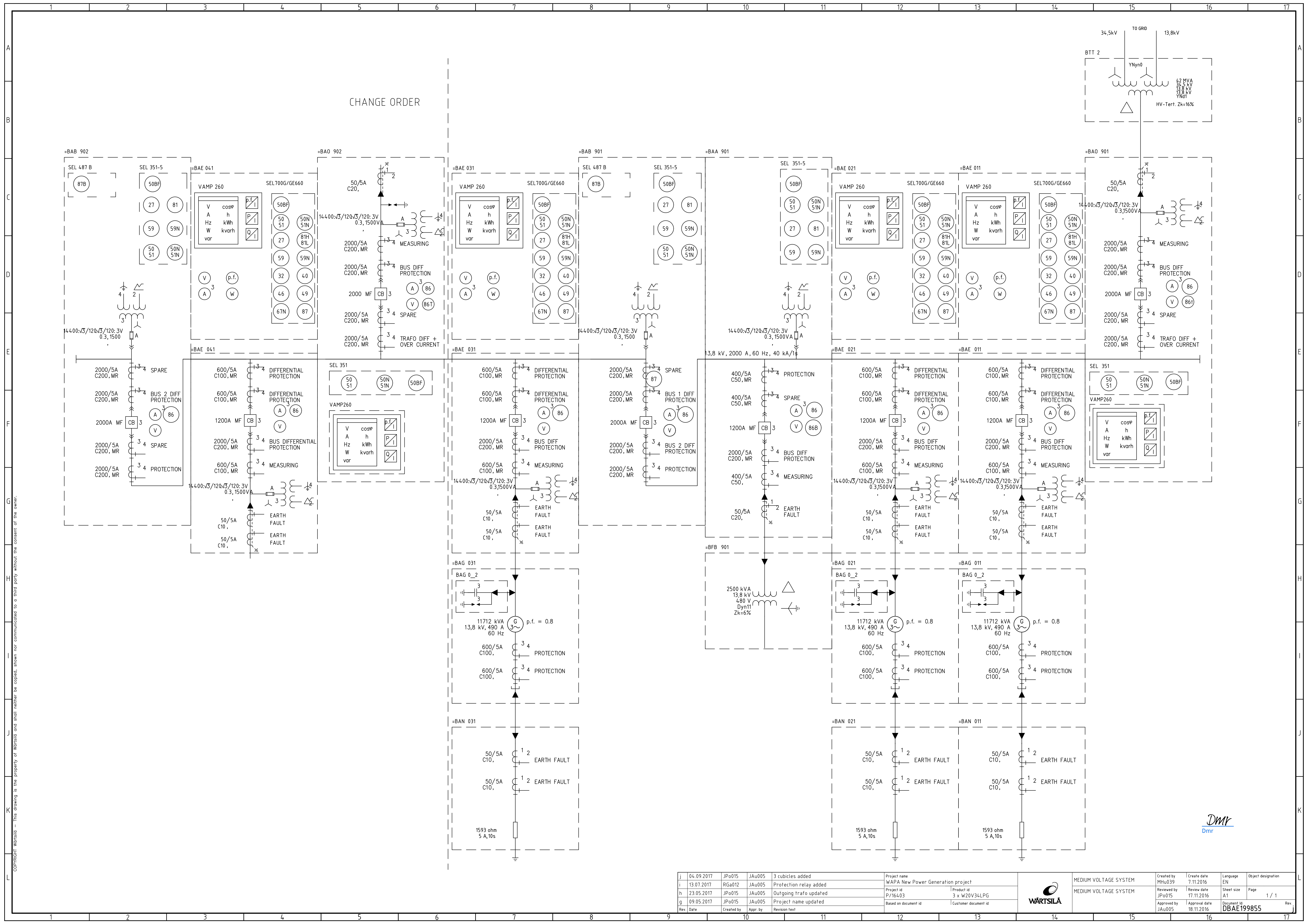
APPENDIX 1.B

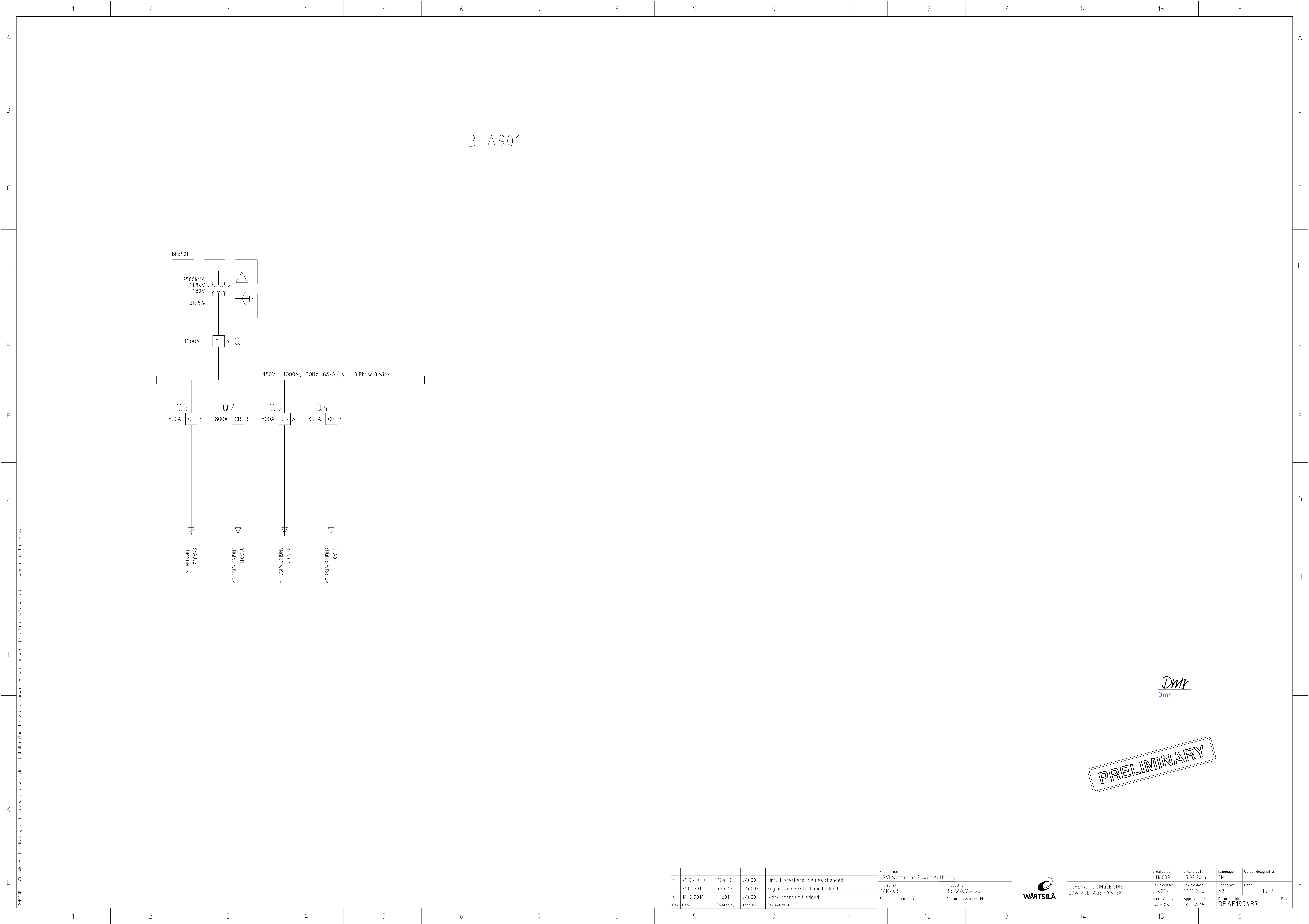
SINGLE LINE DIAGRAM WITH INTERCONNECTION POINT

In this Appendix are included drawings with corresponding single line diagrams of the power plant and substation including Interconnection point between both.

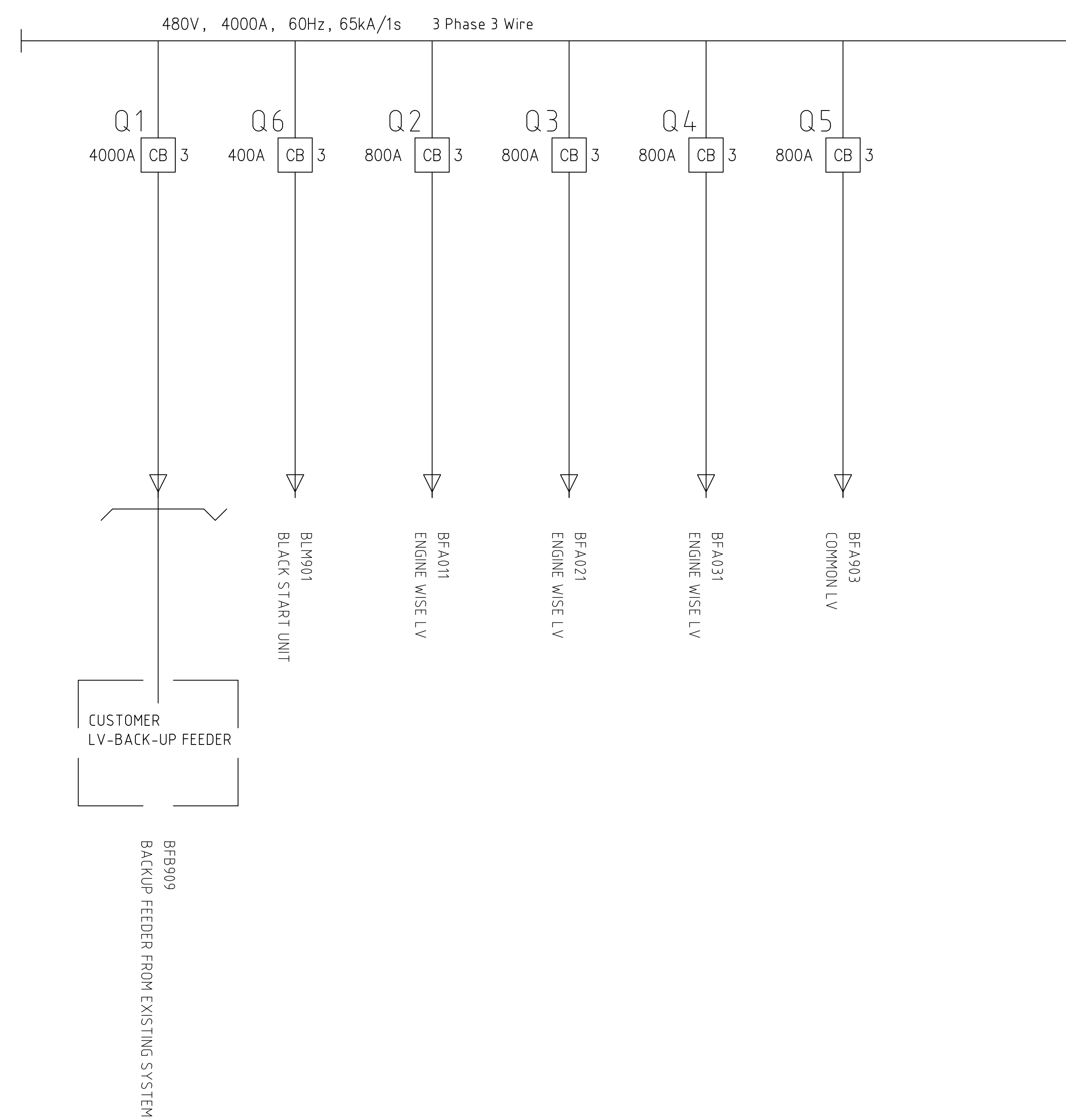
MV schematic [Place holder for drawing DBAE199855_J and DBAE199855_J]

LV schematic [Place holder for drawing DBAE190487_D]



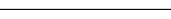


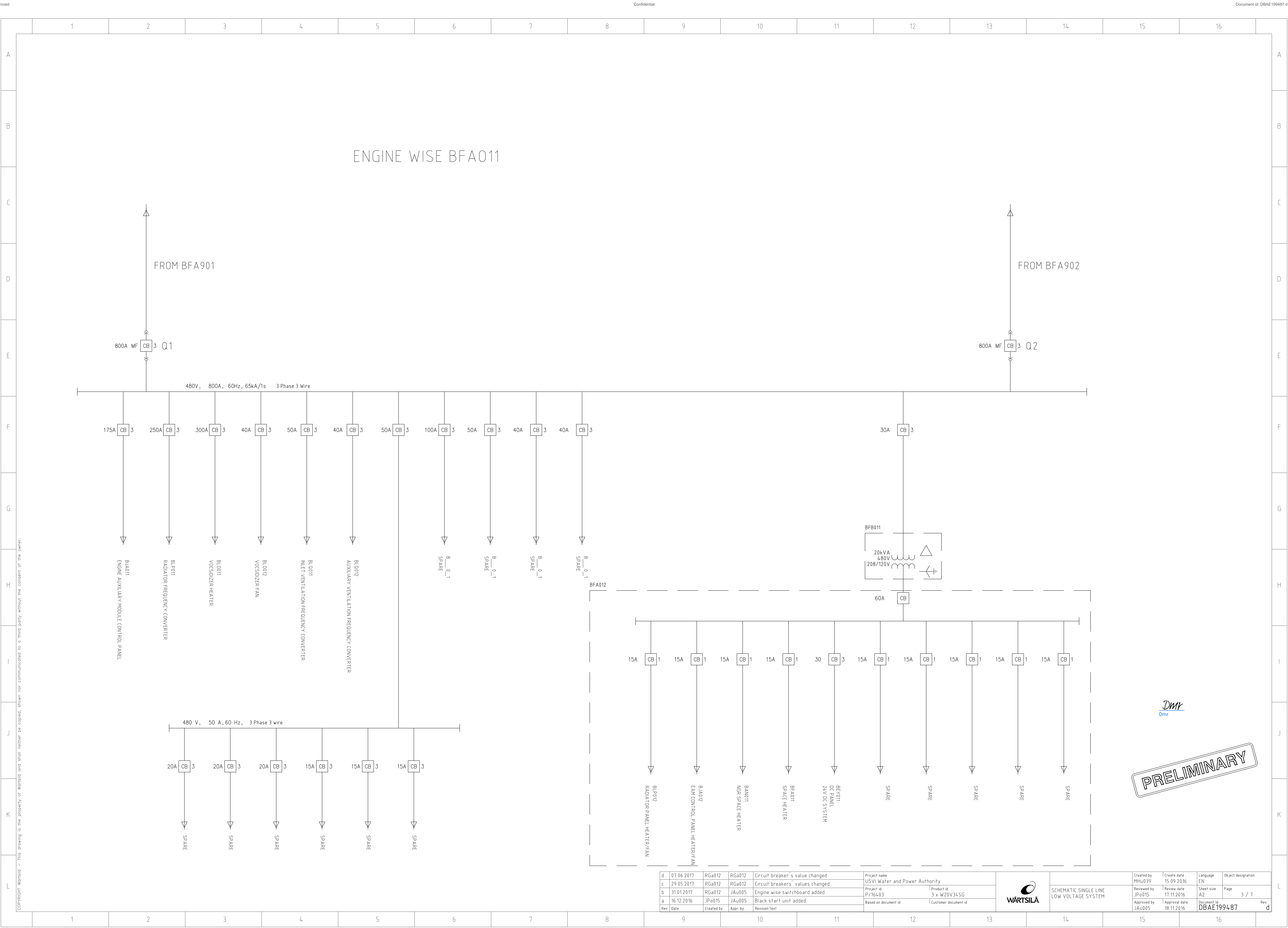
BFA902

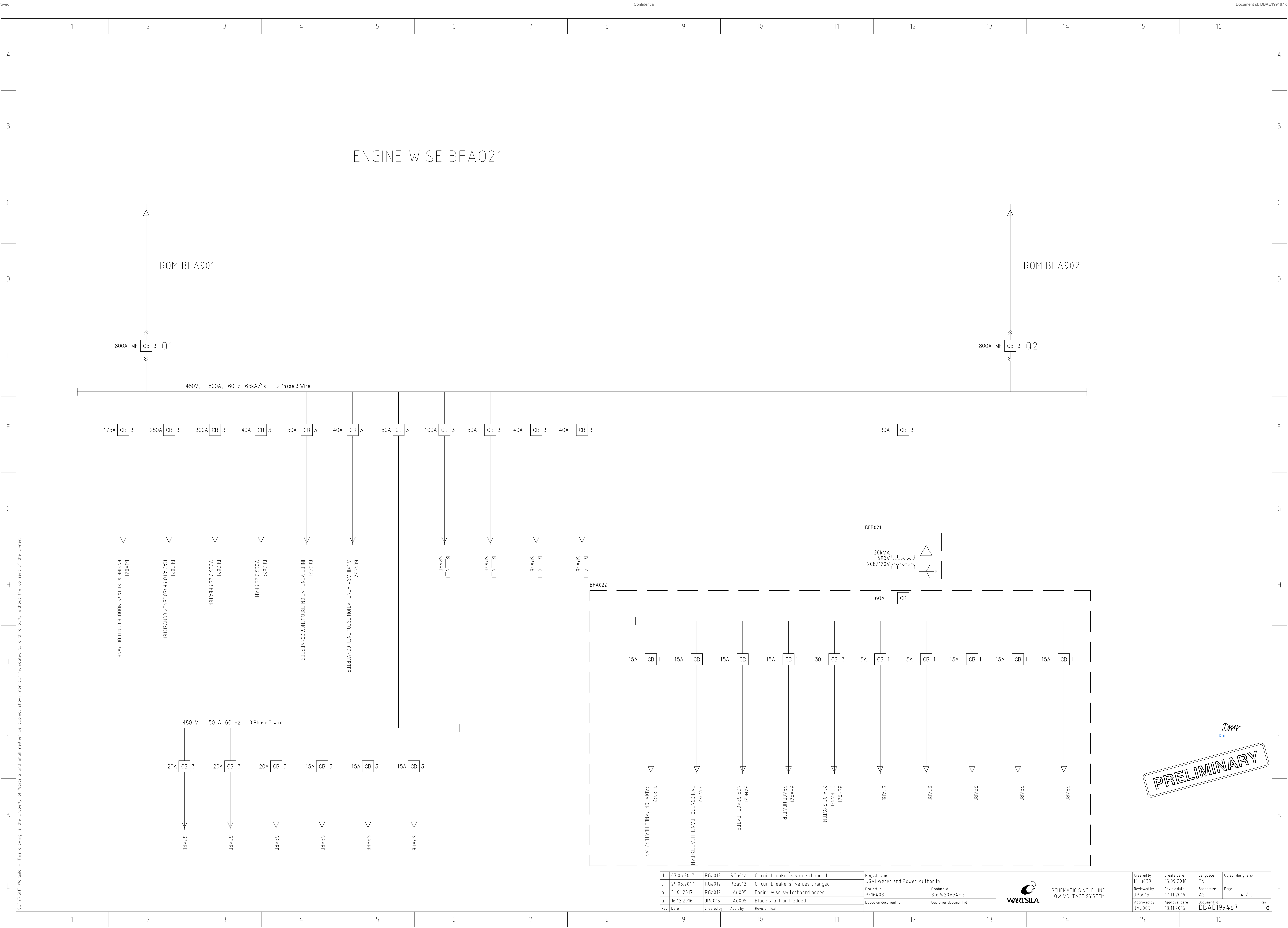


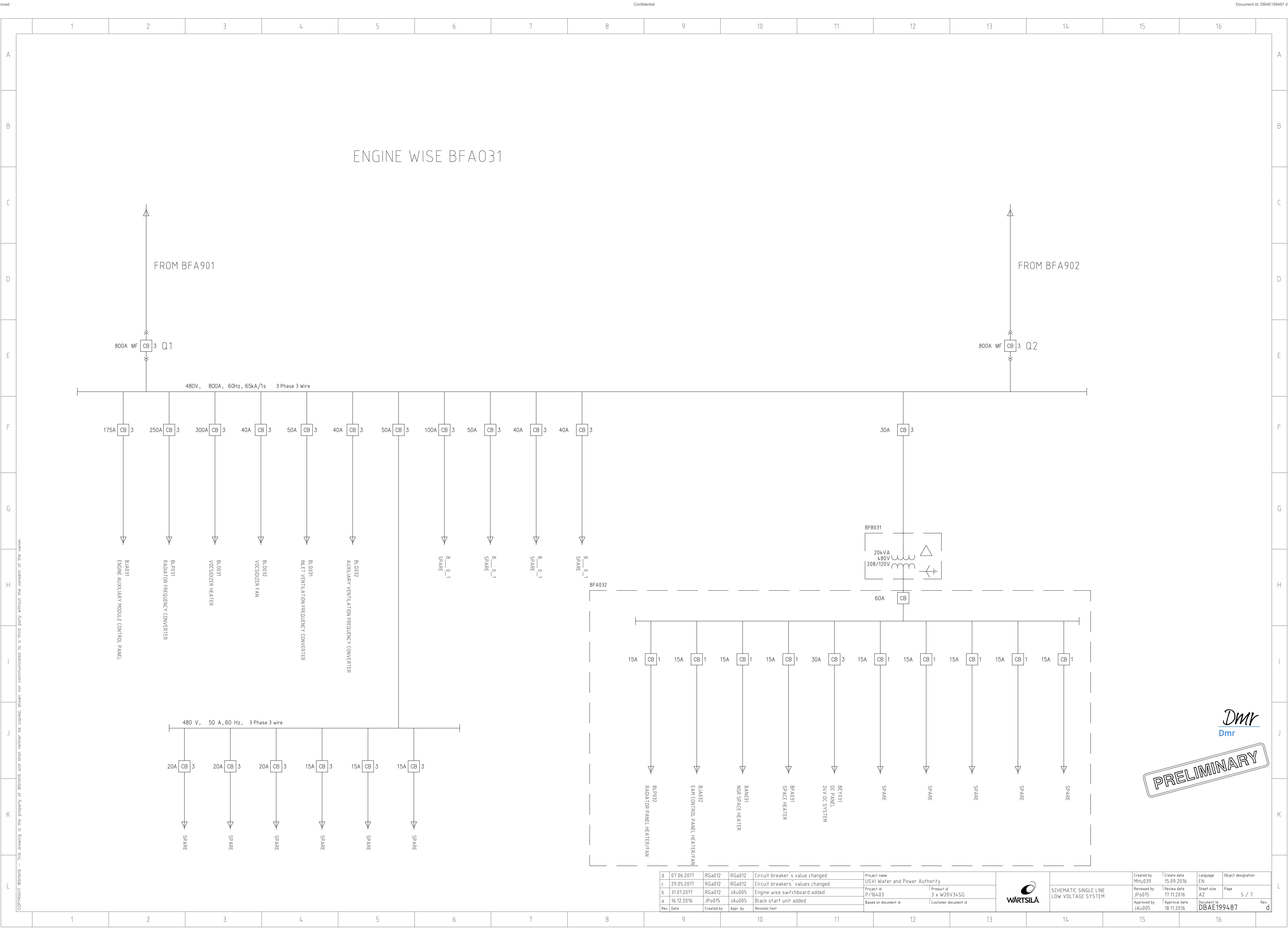
DMR
Dmr

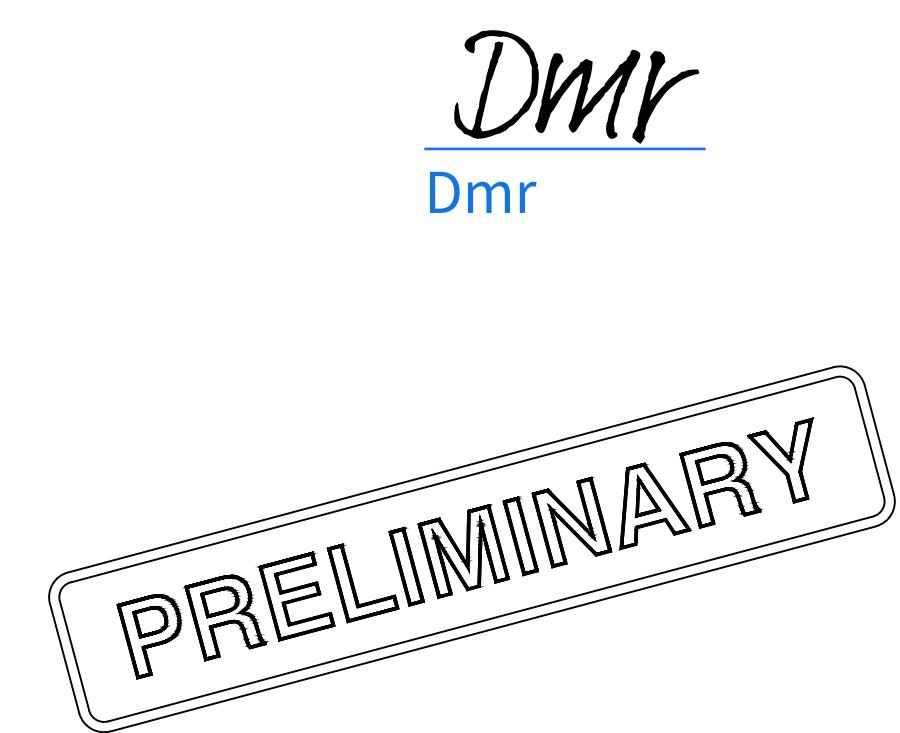
PRELIMINARY

				Project name USVI Water and Power Authority				Created by MHQ039	Create date 15.09.2016	Language	Object designation
c	29.05.2017	RGA012	JAU005	Circuit breakers' values changed			SCHEMATIC SINGLE LINE LOW VOLTAGE SYSTEM	Reviewed by JP0015	Review date 17.11.2016	Sheet size A2	Page 2 / 7
b	31.01.2017	RGA012	JAU005	Engine wise switchboard added				Approved by JAU005	Approval date 18.11.2016	Document ID DBA199487	Rev. C
a	16.12.2016	JP0015	JAU005	Black start unit added							
Rev	Date	Created by	Appr by	Revision		Based on document id Customer document id					









d	07.06.2017	RGa012	RGa012	Circuit breaker's value changed	Project name USVI Water and Power Authority		Created by MHu039	Create date 15.09.2016	Language EN	Object designation	
c	29.05.2017	RGa012	RGa012	Circuit breakers' values changed							
b	31.01.2017	RGa012	JAU005	Engine wise switchboard added	Product id P/16403	Product id 3 x W20V34SG		Reviewed by JPo015	Review date 17.11.2016	Sheet size A2	Page 7 / 7
a	16.12.2016	JPo015	JAU005	Black start unit added	Based on document id	Customer document id		Approved by JAU005	Approval date 18.11.2016	Document id DBAE1994.87	Rev.
Rev	Date	Created by	Appr. by	Revision text							



APPENDIX 1.C

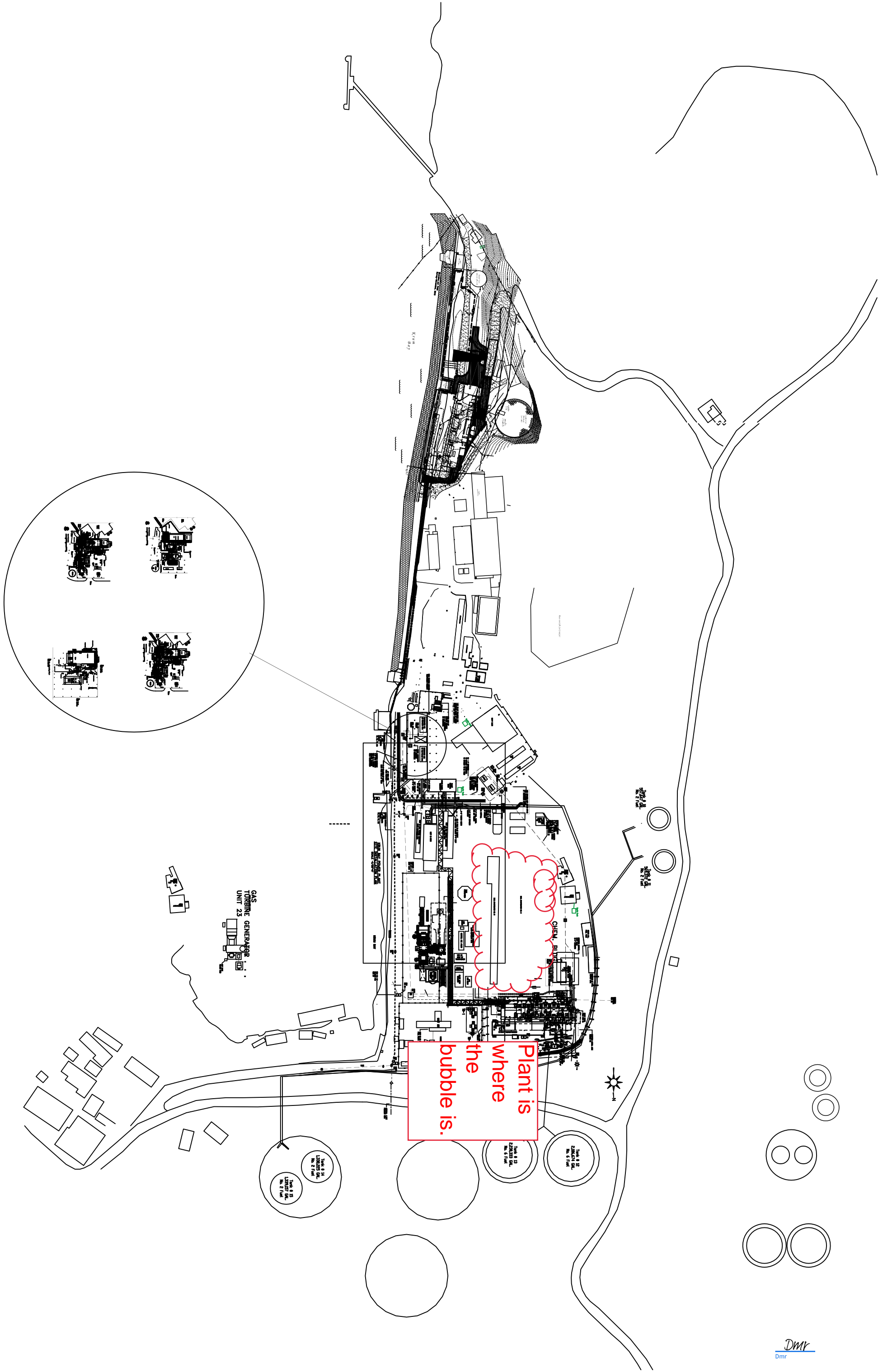
LOCATION OF PROJECT SITE AND FACILITY

In this Appendix is included drawing with corresponding lay-out of Project Site and the Facility.

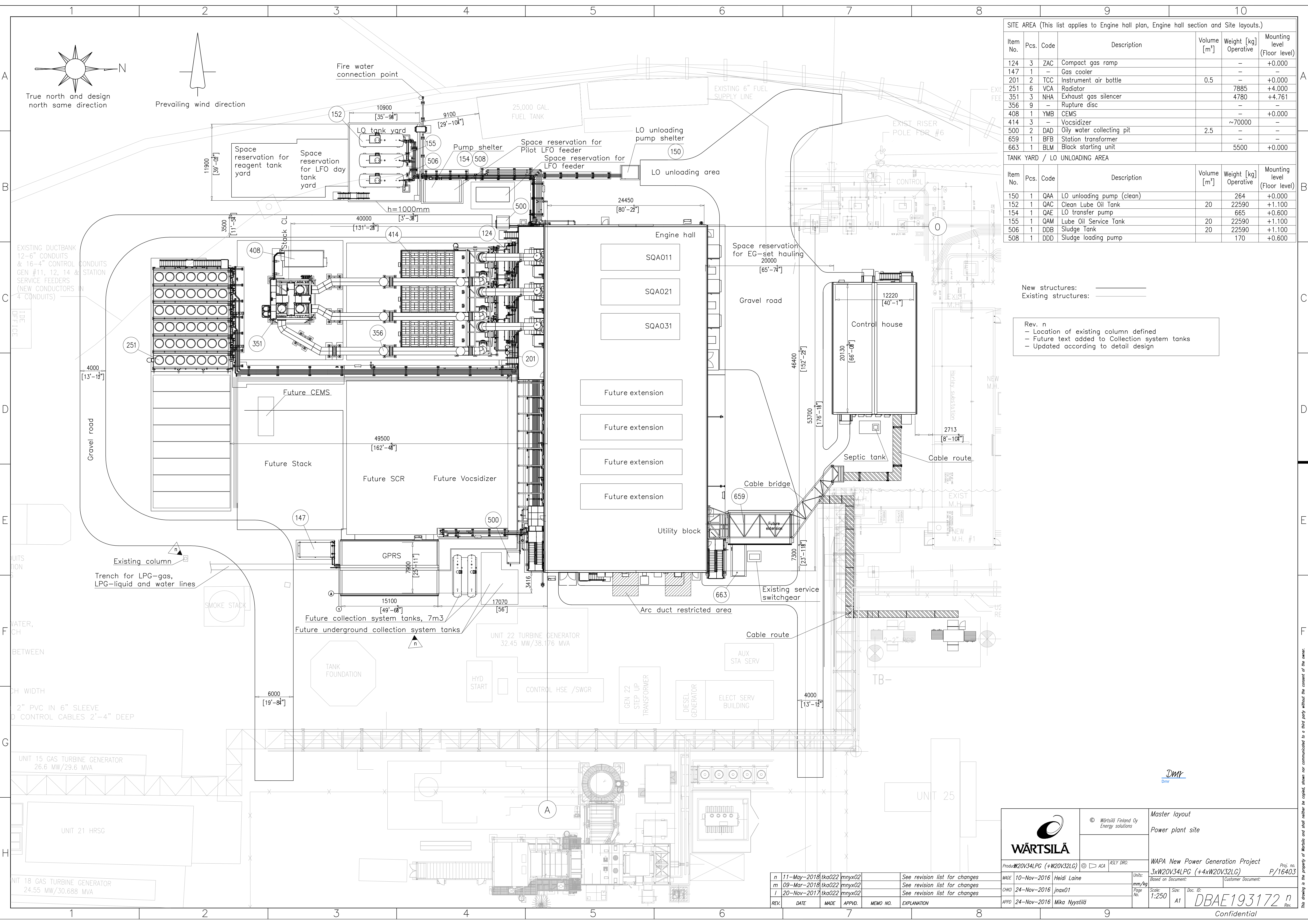
[Place holder for drawing New Plant layout]

[Place holder for drawing DBAE193172_N]

[Place holder for drawing DBAE193170_G]



Plant is
where
the
bubble is.



SITE AREA (This list applies to Engine hall plan, Engine hall section and Site layouts.)						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
124	3	ZAC	Compact gas ramp		—	+0.000
147	1	—	Gas cooler		—	—
201	2	TCC	Instrument air bottle	0.5	—	+0.000
251	6	VCA	Radiator		7885	+4.000
351	3	NHA	Exhaust gas silencer		4780	+4.761
356	9	—	Rupture disc		—	—
408	1	YMB	CEMS		—	+0.000
414	3	—	Vocsidizer		~70000	—
500	2	DAD	Oil water collecting pit	2.5	—	—
659	1	BFB	Station transformer		—	—
663	1	BLM	Block starting unit		5500	+0.000
TANK YARD / LO UNLOADING AREA						
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Operative	Mounting level (Floor level)
150	1	QAA	LO unloading pump (clean)		264	+0.000
152	1	QAC	Clean Lube Oil Tank	20	22590	+1.100
154	1	QAE	LO transfer pump		665	+0.600
155	1	QAM	Lube Oil Service Tank	20	22590	+1.100
506	1	DDB	Sludge Tank	20	22590	+1.100
508	1	DDD	Sludge loading pump		170	+0.600

New structures: _____
Existing structures: _____

- Rev. n
— Location of existing column defined
— Future text added to Collection system tanks
— Updated according to detail design

n	11-May-2018	tka022	mmxx02		See revision list for changes
m	09-Mar-2018	tka022	mmxx02		See revision list for changes
l	20-Nov-2017	tka022	mmxx02		See revision list for changes
REV.	DATE	MADE	APPRD.	MEMO NO.	EXPLANATION

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Energy solutions

Master layout
Power plant site

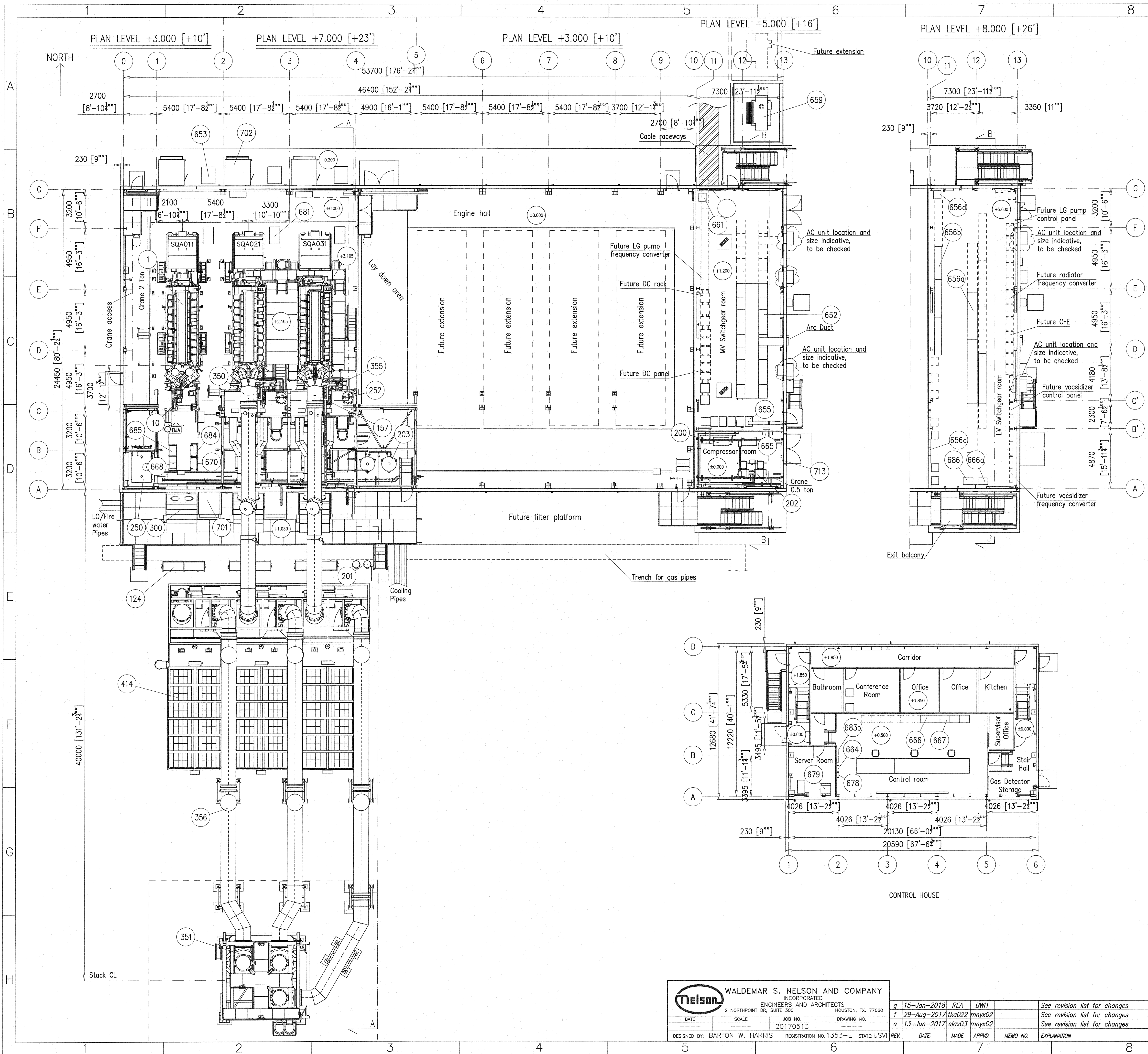
WAPA New Power Generation Project
3xW20V34LPG (+4xW20V32LG)
Based on Document: _____
Customer Document: _____

Proj. no. P/16403
Scale: 1:250
Size: A1
Doc. ID: DBAE193172 n
Rev.

Produkt: W20V34LPG (+W20V32LG) ASLY DRG: _____
MADE: 10-Nov-2016 Heidi Laine
CHKD: 24-Nov-2016 jnax01
APPRD: 24-Nov-2016 Mika Nyystilä

Units: mm/kg
Page No. _____

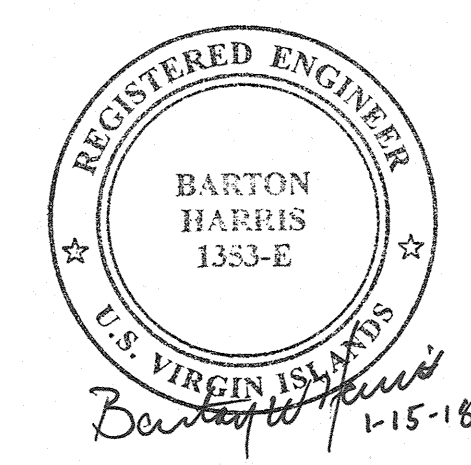
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ENGINE HALL (This list applies to Engine hall plan and Engine hall section.)					
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Mounting level (Floor level)
1	3	SQA	Engine generator set W20V34LPG		137921 +0.000
10	3	MOD	Cube Auxiliary Module		5266 +0.000
157	3	-	Oil mist separator unit		250 +4.630
203	2	TSB	Starting air bottle	4.8	2023 +0.000
250	1	VBA	Maintenance water tank	6.0	7140 +0.400
252	3	VEA	Expansion vessel	0.6	775 +4.630
300	3	NGA	Intake air filter		2535 +1.000
350	3	NHA	Exhaust gas module		6722 +3.850
355	3	NHA	Exhaust gas ventilation unit		200 +4.630
653	3	BAN	Neutral grounding resistor		- +0.378
668	3	CFE	Local control panel		- +0.500
670	3	BLP	Frequency converter for radiator		- +0.500
681	3	BAG	Surge arrester		- +0.500
684	3	BL0	Control panel, Vocsidizer		- +0.500
685	3	BL0	Frequency converter for Vocsidizer		- +0.500
701	3	EAA	Ventilation unit, aux. area (Min. 12m³/s)	1800	+1.000
702	3	EAA	Ventilation unit, engine hall (Min. 18m³/s)	2600	-0.200
UTILITY BLOCK/CONTROL ROOM (This list applies to Engine hall plan and Engine hall section layouts.)					
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Incl. liquids Mounting level (Floor level)
200	1	TCA	Instrument air unit		109 +0.000
202	1	TSA	Starting air unit		1500 +0.000
652	1	BAC	MV Switchgear		- +1.200
655	5	BEY	DC-system		- +1.200
656a	3	BFA	LV Switchgear		- +5.600
656b	3	BFA	LV Switchgear, engine wise		- +5.600
656c	3	BFA	LV Switchgear, engine wise (and transformer)		- +5.600
656d	1	BFA	External Switchpanel		- +5.600
661	1	BLI	Lighting panel (and transformer)		- +1.200
664	1	BLN	Fire detection panel		- +0.500
665	1	BLQ	Ventilation panel		- +0.000
666	1	CFA	Control panel, common		- +0.500
666a	1	CFA	Control panel		- +5.600
667	3	CFC	Control panel, engine wise		- +0.500
678	1	BLN	Gas detecting panel		- +0.500
679	1	-	CCTV control panel		- +0.000
683a	1	-	HVAC panel		- +1.200
683b	1	-	HVAC panel		- +0.500
686	1	-	GPRS panel		- +5.600
713	-	-	Ventilation outlet fan	2.5	-
SITE AREA (This list applies to Engine hall plan, Engine hall section and Site layouts.)					
Item No.	Pcs.	Code	Description	Volume [m³]	Weight [kg] Mounting level (Floor level)
124	3	ZAC	Compact gas ramp		1500 +0.000
147	1	-	Gas cooler		-
201	2	TCC	Instrument air bottle	0.5	- +0.000
251	6	VCA	Radiator		7000 +4.000
351	3	NHA	Exhaust gas silencer		4780 +4.761
356	9	-	Rupture disc		-
408	1	YMB	CEMS		- +0.000
414	3	-	Vocsidizer		- +0.000
500	2	DAD	Oil water collecting pit	2.5	-
659	1	BFB	Station transformer		-
663	1	BLM	Black starting unit		5500 +0.000

Revision list:

- Rev. -g
- Updated acc. to detail design
- "Space reservation for SCR" text removed
- Vocsidizer steel updated



DMR
Dmr

ISSUED BY:
Waldemar S. Nelson & Co.
15-JAN-2018
APPROVED FOR
CONSTRUCTION

WALDEMAR S. NELSON AND COMPANY
INCORPORATED
ENGINEERS AND ARCHITECTS
2 NORTHPOINT DR., SUITE 300
HOUSTON, TX. 77060
20170513
DESIGNED BY: BARTON W. HARRIS
REGISTRATION NO. 1353-E STATE: USVI

g	15-Jan-2018	REA	BWH	See revision list for changes
f	29-Aug-2017	tka022	mnyx02	See revision list for changes
e	13-Jun-2017	elax03	mnyx02	See revision list for changes

DATE	MADE	APPROV.	MEMO NO.	EXPLANATION
15-Jan-2018	BWH			

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Energy Solutions

Master layout
Engine hall plan

Product: W20V34LPG+W20V32LG
MADE: 10-Nov-2016 Heidi Laine
GRD: 24-Nov-2016 Janne Nase
APPD: 24-Nov-2016 Mika Nyystliä

WAPA New Power Generation Project
3xW20V34LPG (+4xW20V32LG)
Based on Document: (Customer Document)
Scale: 1:150
Size: A1
Doc. ID: DBAE193170 9
Confidential

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APPENDIX 2

OWNER SUPPLIED PARTS AND TOOLS

Appendix 2.A	Safety Parts and Exchange Spare Parts
Appendix 2.B	Tools and Equipment
Appendix 2.C	Office Equipment

APPENDIX 2.A

SAFETY SPARE PARTS AND EXCHANGE SPARE PARTS

Safety Spare Parts.

Part number	Description	Quantity
100003	Antipolishing ring	1
100023	O-ring	2
100110	Cylinder liner	1
100113	O-ring	1
100142	Sealing set	1
100341	Thrust bearing kit	1
100342	Main bearing kit	2
111010	Connecting rod, lower part	1
111011	Connecting rod, upper part	1
111015	Shim	1
111016	Big end bearing kit	1
113001	Piston	1
113009	Securing ring	2
113010	Gudgeon pin	1
113012	Piston ring set	1
120013	Valve guide	1
120015	Sealing set for cylinder head replacement	2
120021	Seat ring for inlet valve	1
120022	Seat ring for outlet valve	1
120054	Sealing set for cylinder head overhaul	2

120095	Ignition coil	2
121001	Exhaust valve, complete	2
121007	Inlet valve, complete	2
123001	Starting valve	2
124002	Spark plug	20
124043	Sealing set	2
124044	Prechamber control valve	2
145001	Push rod	2
145018	Valve tappet	1
1561301	Short cartridge kit	3
156383	Spare part set	1
164025	Main gas admission valve	2
164089	Spare part set	1
181077	Service kit	1
182062	Sealing set	1
191051	Sealing set	1
200009	Screw	12
200011	Nut	12
200029	Gasket	2
200079	Bellows	1
200081	Bellows	1
200084	Screw	12
200085	Nut	12
200334	Positioner	1
200347	Sealing ring	2

202009	Bellows	2
202053	Screw	16
202148	Sealing ring	4
202149	Nut	16
202358	Screw	8
207986	Butterfly valve	1
471063	Filter cartridge	78
471126	Sealing set	1
473081	Sealing set	1
474043	Sealing set	1
476009	Sealing set	1
504103	Knock sensor	2
504128	Temperature sensor	2
5071072	Control unit CCM	1
5071289	Ignition module	1
516292	Control unit	1
516387	Engine safety module	1
516541	Pressure sensor	2
516963	Fuse 3,15A	8
800264	Sealing set for hydraulic tightening tool	2
CV519	IP-converter	1
PT201	Pressure sensor	1
PT241	Lube oil pressure, filter inlet	1
PT401	Pressure sensor	2
PT471	Pressure sensor	2

PT601	Pressure sensor	2
PT700	Pressure sensor	1
PT901	Pressure sensor	2
PT911	Pressure sensor	2
ST173	Speed pick-up	1
ST174	Speed pick-up	1
ST196P	Speed sensor	1
ST196S	Speed sensor	1
ST197P	Speed sensor	1
ST197S	Speed sensor	1
TE201	Temperature sensor	1
TE401	Temperature sensor, HT water, before engine	1
TE402	Temperature sensor	2
TE471	LT-water temp., before charge air cooler	2
TE600	Temperature sensor, charge air engine inlet	1
TE601	Temperature sensor	1

Exchange Spare Parts.

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
120001	Cylinder head complete	10
120075	Cylinder head	10
1561184	Nozzle	2
1561300	Short cartridge	2
181001	Lubricating oil pump	1
191001	HT-water pump	1
191002	LT-water pump	1
476001	Charge air cooler	1
124044	Prechamber control valve	20
124047	Prechamber valve, lower	20
1562001	Shroud Ring	2

Auxiliary Equipment Safety Spare Parts.

System

3xAUX-Generator W32/W34 DCB- GS 658.5 SM50

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
10021471	TRAILING TUBE (F70)	30
3584441	RUBBER BLOCK 8.5 SM50	30

System

3xAUX-NGA Charge air filter AAF 8- 110 + F5 (W20V32/34)

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
03507030	ADHESIVE GASKET	1
10010780	DD PANEL 4` RIGHT	51
10010784	DD PANEL 4` LEFT	51
4601120	ELECTRIC MOTOR	1
70001540	ELECTRONIC TIMER	1
8039900246	FINE FILTER CHEVRONET 595X595X150	16
9110140	UPPER SHAFT SEAL	2
9110770	CHAIN LINK	200
9110780	JUNCTION LINK	4
9172100	COUPLING NUT	2

System

3xAUX-Charge air system & Exhaust gas system NHA Exhaust gas ventilation unit (W34)

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
NHA003	BELLOWS	1
NHA004	RADIAL FAN MPT-290T WITH ELECTRIC MOTOR	1
NHA005	FLOW SWITCH	1

System**9xAUX-NHA Rupture disc NHA Rupture disc****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
282030	GASKET DN1200	2
67111620003	RUPTURE DISC CV-S-I-LW-RI DN1200	1
WDAAA22168	SUPPORT RING DN1200	2

System**3xAUX-ZBA Gas regulating unit / CGR W34SG Compact gas ramp (DBAE171890-)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
B00191	FILTER	2
B00192	SEALING SET	1
Q00030	SPARE PART SET	1
Q00032	SPARE PART SET	1
Q00048	SPARE PART SET	1
Q00049	SPARE PART SET	1
V00387	SERVICE KIT	1
V00388	GASKET	1
V00410	SPARE PART SET	2
V00414	SOLENOID	1
V00483	SERVICE KIT	1
V00564	LIMIT SWITCH	1
V00570	SOLENOID VALVE	1
V00626	GASKET SET	1
V00627	BALL	1
V00654	SOLENOID VALVE	1
V00755	PACKING RING	1
V00895	SEAT RING AND PLUG STEM ASSEMBLY	1
V00898	SPARE PART SET	1
ZAC006	THERMOMETER	1
ZAC052	PRESSURE TRANSMITTER	1

System**1xAUX-QAA Lube oil unloading pump unit, new 8,1 / 9,9 m3/h****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
D00057	SPARE PART SET	1
D00301	SPARE PART SET	1
M00002	BALL BEARING	1
M00009	BALL BEARING	1

System**1xAUX-QAE Lube oil transfer pump unit, stationary 8,1 / 9,9 m3/h****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
C60N2PD2UL	MCB C60N 2PD2 UL	1
D00057	SPARE PART SET	1
D00301	SPARE PART SET	1
F30001160	MCB C 60N 1PC2	1
F30001162	MCB C 60N 1PC4	1
F30002010	MOTOR PROTECT SWITCH GV2-ME14 6-10A	1
K20001079	CONTACTOR LC1-D 09F7	1
M00002	BALL BEARING	2
M00009	BALL BEARING	2
PR125251AR23EN	SELECTOR SWITCH 0-1-S PR125251AR23EN	1
XB4-BVG3	INDICATOR LIGHT GREEN XB4-BVG3	1
XB4-BVG4	INDICATOR LIGHT RED XB4-BVG4	1
XB4-BVG5	INDICATOR LIGHT YELLOW XB4-BVG5	1

System**3xAUX-QBF Oil mist separator QBF Oil mist separator Purevent single****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
B00032	SERVICE KIT	1
B00035	ISOLATOR KIT	1
B00036	FREQUENCY CONVERTER	1
B00037	O-RING	1

System**2xAUX-TSB Starting air bottle TSB Starting air bottle****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
2-211-177	SAFETY VALVE	1
4-211-178	MANOMETER 30 BAR	1

System**9xAUX-VCA Radiator FBLGS-1260-18-3A10-108DN80S6****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
9460065100	BEARING FOR FAN MOTOR (6310-C3)	3
9460065953	BEARING FOR FAN MOTOR (6308-C3)	3
9460153452	SAFETY SWITCH KUM 332U/EMC, U3, 2xM32	1
9460158740	MOTOR WU-DF180LUX-10 380-420/50Hz	1
9460158742	Axial Fan 1815- A4.3-1815-03-SML-D	1

System**3xAUX-VEA Expansion tank HT/ LT Expansion tank 600 L****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
VEA003	LEVEL SWITCH	1

System**1xAUX-VBA Maintenance water tank 6,0 m3 (9,0 m3/h)(CDX 120/12)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
EB251450008	IMPELLER	1

System**2xAUX-DDA Oily water transfer pump unit DL-40****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
D00279	SPARE PART SET	1

System**3xAUX-Engine auxiliary panel ABB- auxiliary panel****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
480380/110/24VAC	TRANSFORMER 400/110 300VA	2
6ES71534AA010XB0	INTERFACE IM 153-4 MODULE 6ES7153-4AA01-0XB0	1
6ES73211BP000AA0	DIGITAL INPUT 6ES7321-1BP00-0AA0	1
6ES73221BL000AA0	DIGITAL OUTPUT 6ES7 322-1BL00-0AA0	1
6ES73311KF020AB0	ANALOG OUTPUT 6ES7331-1KF02-0AB0	1
6ES73325HD010AB0	ANALOG OUTPUT MODULE 6ES7-332-5HD01-0AB0	1

AVK9020B	PANEL LIGHT AVK 9020B	1
C60N 1C0.5	MCB C60N 1C0.5	2
C60N 1C2	MCB C60N 1C2	2
C60N 1C4	MCB C60N 1C4	2
C60N 1P C1	MCB C60N 1C1	2
C60N2C2	MCB C60N 2C2	2
C60N2C4	MCB C60N 2C4	2
C60N3C1	MCB C60N 3C1	2
C60N3C10	MCB C60N 3C10	2
C60N3C16	MCB C60N 3C16	2
C60N3C4	MCB C60N 3C4	2
FLK14EZDR100KONF	CABLE FLK 14/EZ-DR/100/KONFEK	1
FPF12KU115BE-110	FAN AND FILTER UNIT FPF12KU115BE-110	1
FPF12KUG	OUTLET FILTER FPF12KUG	1
GV2ME08	MOTOR PROTECTION SWITCH GV2 ME08 (2.5-4A)	1
GV2ME14	MOTOR PROTECTION SWITCH GV2 ME14 (6-10A)	1
GV2ME16	MOTOR PROTECTION SWITCH GV2 ME16 (9-14A)	1
GV2ME20	MOTOR PROTECTION SWITCH GV2 ME20 (13-18A)	1
GV3P65(48-65A)	MOTOR PROTECTION SWITCH GV3 P65 (48-65A)	1
GVAE20	AUXILIARY CONTACT GV AE20	1
LADN20	AUXILIARY CONTACT LAD N20	1
LADN22	AUXILIARY CONTACT LAD N22	1
LC1D09F7	CONTACTOR LC1 D09F7 110VAC	1
LC1D18BD	CONTACTOR LC1 D18BD 24VDC	1
LC1D18F7	CONTACTOR LC1 D18F7 110VAC	1
LC1D65F7	CONTACTOR LC1 D65F7 110VAC	1
NES13DB24SA	SAFETY RELAY NES13DB24SA 24VDC	1
OF 26924	AUXILIARY CONTACT SD 26924	4
PF390300075	HAND CONTROL PF390300075	1
PLCRSC24DC21	AUX. RELAY + BASE PLC-RSC-24 DC/21	10
RXZE2S114M	CONNECTION BASE RXZE2S114M	3
WDU4	TERMINAL WDU 4	30
WSI 6 LD	FUSE TERMINAL BLOCKS WSI 6 LD FUSE 100MA	10
WSI6LD24VDCFUSE1	FUSE TERMINAL BLOCKS WSI 6 LD FUSE 1A	10
ZB5-AK1313WHITE	LIGHT SWITCH HANDLE ZB5-AK1313 WHITE	1
ZB5-AW0B13	BODY/ CONTACT BLOCK WITH LED ZB5-AW0B13	1
ZBE-101	CONTACT BLOCK ZBE-101	1

System**6xAUX-MV- switchgear MV- switchgear (ABB Unigear)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
6ED1052	PROGR. LOGIC CONTROLLER (PLC) 6ED1052-1FB00-0AB5	1
6ED1055	EXPANSION MODULE 6ED1055-1FB00-0BA1	2
700-M220A1	AUXILIARY RELAY 700-M220A1 110 VAC	10
700DC-M220Z11	AUXILIARY RELAY 700DC-M220Z 110 VDC	10
800EP-F3	PUSH BUTTON 800EP-F4, GREEN	3
800EP-F4	PUSH BUTTON 800EP-F4, RED	3
800EP-F6	PUSH BUTTON 800EP-F6, BLUE	3
FB96A;2500	AMPERE-METER FB96	2
FB96A;500	AMPERE-METER FB96	2
FB96V	VOLTMETER FB96	1
HD4170632GEN	SF6 CIRCUIT BREAKER HD4 17.06.32 (GEN)	1
HD4170632STA	SF6 CIRCUIT BREAKER HD4 17.06.32 (STA)	1
HD4172532OUT	SF6 CIRCUIT BREAKER HD4 17.25.32 (OUT)	1
HD4CHARG110VDC	CHARGING MOTOR 110VDC FOR HD4 BREAKER	1
HD4CLOS110VDC	CLOSING COIL 110VDC FOR HD4 BREAKER	5
HD4TRIP110VDC	TRIPPING COIL 110VDC FOR HD4 BREAKER	1
HD4UNDE110VDC	UNDER VOLTAGE COIL 110VDC FOR HD4 BREAKER	1
KOKM 06J2	SUMMARY CURRENT TRANSFORMER KOKM 06J2	3
PAVC161	AUXILIARY RELAY SOCKET PAVC 161	10
S201-Z4	MCB S201-Z4	3
S202-C6	MCB S202-C6	3
S203-Z4	MCB S203-Z4	3
S2CH6R	AUXILIARY CONTACT S2C-H6R	5
TJC 5	VOLTAGE TRANSFORMER TJC5	3
TPU 50.13;150	CURRENT TRANSFORMER TPU 50.13	1
TPU 50.13;500	CURRENT TRANSFORMER TPU 50.13	1
TPU 54.33;1250	CURRENT TRANSFORMER TPU 54.33	1
TPU 56.33;2500	CURRENT TRANSFORMER TPU 56.33	1
VAMP1353X7AAA	VOLTAGE AND FREQUENCY RELAY VAMP 135- 3X7AAA	1
VAMP1403A7AAA	OVER CURRENT RELAY VAMP 140-3A7AAA	1

System**1xAUX-LV-switchgear LV-switchgear (Elkamo)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
100AGG00	FUSE 100A GG00	3
125AGG00	FUSE 125A GG00	3
160AGG1	FUSE 160A GG1	3
200AGG1	FUSE 200A GG1	3
20AGG00	FUSE 20A GG00	3
250AGGI	FUSE 250A GG I	3
3*125A	SWITCH FUSE FUSERBLOCK 3*125A	1
3*250A	SWITCH FUSE FUSERBLOCK 3*250A	1
50AGG00	FUSE 50A GG00	3
63AGG00	FUSE 63A GG00	3
80AGG00	FUSE 80A GG00	3
BQ96	V- METER BQ-96; 0-500V	1
BQ96020005A	A- METER BQ-96 0- 2000/5A	3
C60N1PC10	MCB C 60N 1PC10	2
C60N1PC16	MCB C 60N 1PC16	2
C60N1PC20	MCB C 60N 1PC20	2
C60N2PC6	MCB C 60N 2PC6	2
C60N3PC10	MCB C60N 3P C10	2
C60N3PC16	MCB C60N 3P C16	2
CAD32V7	AUXILIARY RELAY CAD-32V7 400VAC	1
FPF15KPR230B	FILTER FAN FPF 15KR230B (R)-110	2
GV2ME08	MOTOR PROTECTION SWITCH GV2 ME08 (2.5-4A)	1
GV2P16	MCB GV2-P16; 9-14A	1
GVAD0110	AUX CONTACT GV-AD0110	1
K1D80207Z	CONTROL SWITCH K1D80207Z; A-0-1<-START	1
K1F027MC	SELECTOR SWITCH K1F027MC	1
KBC1B	CONTROL SWITCH KBC-1B+K1D-024M	1
LA7D1020	AUXILIARY DEVICE LA7D 1020	1
LADN31	AUX. CONTACT LA-DN31	1
LADR2	DELAY UNIT LAD-R2 0,1-30 S	1
LC1D18F7	CONTACTOR LC1 D18F7 110VAC	1
LC1D65F7	CONTACTOR LC1 D65F7 110VAC	1
LR2D1321	THERMAL RELAY LR2-D 1321	1
LR2D3357	THERMAL RELAY LR2-D 3357	1
LRD3359	THERMAL RELAY LR-D3359	1
MCH110VDC	SPRING MOTOR MCH 110VDC	1

MN110VDC	UNDervoltage RELEASE MN 110VDC	1
MX110VACDC	SHUT RELEASE MX 110VDC	1
NS80HMA80	CIRCUIT BREAKER NS80H-MA80	1
RAC45230V	SECTION HEATER RAC-45 230V	2
RUN31A21F7	AUXILIARY RELAY RUN31A21F7+RUZ1A 110VAC	2
RUN31A21FD RUZ1A	AUXILIARY RELAY RUN31A21FD+RUZ1A 110VDC	1
SD	AUXILIARY CONTACT SD	2
SDE	ALARM CONTACT SDE	1
SEL22D130VGREEN	PILOT LIGHT GREEN SEL-22D-130V	1
SEL22D130VRED	PILOT LIGHT RED SEL-22D-130V	1
XF54499	CLOSING RELEASE XF- 110 VDC	1
ZB5AA331	PUSH BUTTON ZB5-AA331	1
ZB5AA432	PUSH BUTTON ZB5-AA432	1
ZB5AZ101	BODY ZB5-AZ101	2

System

3xAUX-Neutral point cubicle Neutral point cubicle

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
TO105UE	CURRENT TRANSFORMER	1

System

3xAUX-Radiator panel Radiator panel

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
MS325-12.5+HK11	CIRCUIT BREAKER MS325-12.5+HK11	2
OA1G10	AUXILIARY CONTACT	2
S201-C4	MCB S201-C4	2
S2CH6R	AUXILIARY CONTACT S2C-H6R	2
SK3110	THERMOSTAT SK 3110	1
SK311650120W	HEATER SK3116; 50/120W	1
SK3322107	FILTER FAN SK 3322.107	1
SK3322207	OUTLET FILTER SK 3322.207	1

System

3x AUX-Frequency converter NXS01055A5H (Radiator)

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
FAN KIT NXS	MAIN FAN KIT NXS SERIES	1
NXS01055A5H	FREQUENCY CONVERTER	1

System**3xAUX-Frequency converter NXS00315A2H (Freq. conv. for roof)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
FAN KIT NXS	MAIN FAN KIT NXS SERIES	1
NXS00315A2H	FREQUENCY CONVERTER	1

System**3xAUX-Frequency converter NXS00385A5H (Gen. outlet fan)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
FAN KIT NXS	MAIN FAN KIT NXS SERIES	1
NXS00385A5H	FREQUENCY CONVERTER	1

System**3xAUX-DC- system MPS 24V****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
18060150	SHUNT 150A/60MV	1
52500211	AUXILIARY CONTACT 07350	2
DX2C12510KA	MCB DX-2C125 10KA	2
DX2C166KA	MCB DX-2C16 6KA	2
DX2C206KA	MCB DX-2C20 6KA	2
DX2C326KA	MCB DX-2C32 6KA	2
DX2C506KA	MCB DX-2C50 6KA	2
DX2C66KA	MCB DX-2C6 6A	2
MPK318D24V	SYSTEM ADAPTER MPK 318D/24V	1
MPK320DRCU24V	CONTROL UNIT MPK-320D RCU/24V	1
MPK34724V	FUSE ADAPTER MPK 347/24V	1
MSR2440	RECTIFIER MSR24/40	1

System**2xAUX-DC- system EIPS 110V****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
18060150	SHUNT 150A/60MV	1
52500211	AUXILIARY CONTACT 07350	2
94M037	LED MODULE 94M037	1
94M096D	DIGITAL SUPERVISOR 94M096D	1
94M102B	FUSE CONTROL UNIT 94M102	1
BEB10	EARTH BALANCING UNIT BEB-10	1
DX1C166KA	MCB DX-1C16 6KA	2
DX2C166KA	MCB DX-2C16 6KA	2
DX2C206KA	MCB DX-2C20 6KA	2
DX2C636KA	MCB DX-2C63 6KA	2
DX2C66KA	MCB DX-2C6 6A	2
ELM10	EARTH LEAKAGE MONITOR ELM-10	1
IPS1800110V	RECTIFIER IPS 1800 110V	1

System**3xAUX-Generator AMG 1120****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
9893305	OPERATIONAL SPARE PART PACKAGE	1

System**1xAUX-QLC Lube oil transfer pump unit, mobile 8,1 / 9,9 m3/h****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
D00057	SPARE PART SET	1
D00301	SPARE PART SET	1
M00003	BALL BEARING	1
M00004	BALL BEARING	2
M00015	BALL BEARING	1

System**1xAUX-ZAA Gas pressure reduction unit ZAA Gas pressure reduction unit****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
0136630	GASKET FOR FA-12-AP 80 FILTER	2
2200093	KIT FOR PS/79	1
2200469	KIT FOR OS/80X-APA-D	1
2200836	KIT FOR BM5/40	1
4009825	FILTER CARTRIDGE FA-12-AP 80	2

System**3xAUX-NHC Turbo washing unit NHC Turbo washing unit (gas engine)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
V00721	SOLENOID VALVE	1

System**3xAUX-VDA W32/34 W32/34 Preheating unit EL (60Hz)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
D00445	Sealing kit	1
D00446	Impeller	1
VDA007	SAFETY VALVE	1

System**3xAUX-MOD W34 EAM W34SG EAM 1-C v.2.2 (1 preheater) 60Hz****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
B00055	FILTER ELEMENT G5XP4-D	1
V00082	SPARE PART SET ARI FIG	1
V00083	GASKET ARI FIG	1

System**1xAUX-Atlas Copco GA 15-125 AP****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
2901086601	Filter kit	1
3001500651	Service Kit for dryer	1

System**1xAUX-TSA Starting air compressor unit - double (E-E) XA150 E-E****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
XA150-CR	XA150 MAKERS RECOM SPARES	1

System**1xAUX-DDC Sludge transfer pump unit 1,8 m3/h****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
BORNE10	ROTOR PUMP EL 164	1
BORNE22	STATOR PUMP EL 164	1

System**3xAUX-CEMS - Suomi analytics Ultramat 23 - Continuous gas analysis****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
100587	O-ring for sample cell	1

System**3xAUX-HVAC Ventilation unit 12 m³/s (Leimec)****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
SPWES00000205	PRESSURE SWITCH	1
SPWES00000210	PRESSURE GUAGE	1
SPWES00000315	BAG FILTER SET	1
SPWES00000400	SAFETY SWITCH	2

System**3xAUX-HVAC Ventilation unit 18 m³/s****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
KUA340	SAFETY SWITCH KUA 340	1
VAIRBAG00002	AIRBAG 287*592*330/3 G4	3
VAIRBAG00003	AIRBAG FILTER 592*592*330/6 G4	15
WEG160L	FAN MOTOR WEG160L	1

System

2xAUX-CFA- Common control panel Common control panel ABB

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
200700900BMR1	FOOT FOR LIGHT MOD. 200700900, BMR1	1
210501900SLL	LIGHT MODULE YELLOW 210501900, SLL	1
210502900SLL	LIGHT MODULE RED 210502900, SLL	1
210506900SLL	LIGHT MODULE GREEN 210506900, SLL	1
6ES73172AJ100AB0	CPU 317-2DP	1
6ES73211BL000AA0	DIGITAL INPUT MODULE S7-300; 6ES7-321-1BL00-0AA0	1
6ES73221BL000AA0	DIGITAL OUTPUT 6ES7 322-1BL00-0AA0	1
6ES73311KF010AB0	ANALOG INPUT MODULE 6ES7-331-1KF01-0AB0	1
6ES73325HD010AB0	ANALOG OUTPUT MODULE 6ES7-332-5HD01-0AB0	1
6ES73650BA010AA0	INTERFACE MODULE SIMATIC S7-300	1
6ES79538LL110AA0	MEMORY CARD 6ES7 953-8LL11-0AA0	1
6ES79720BA500XA0	BUS CONNECTOR 6ES7 972-0BA50-0XA0	1
6ES79720BB500XA0	BUS CONNECTOR 6ES7 972-0BB50-0XA0	1
6GK73431EX200XE0	COMMUNICATIONS PROCESSOR CP 343-1	1
890010905	LIGHT BULB 890010905, GL24, Ba15d 30V 5W	3
BE9690ACTI	ACTIVE POWER METER BE-96 90°	1
BE9690AMPE	A- METER BE-96 90°	1
BE9690FREQ	FREQUENCY METER BE-96 90°	1
BE9690POWE	POWER FACTOR METER BE-96 90°	1
BE9690REAC	REACTIVE POWER METER BE-96 90°	1
BE9690VOLT	VOLTAGE METER BE-96 90°	1
C3A30X115VAC	AC-AUXILIARY RELAY C3A30-X115VAC	10
C3A30X24VDC	DC- AUXILIARY RELAY C3A30-X24VDC	20
C60OF	ALARM CONTACT C60 OF	6
FAS-115DG	AUTO-SYNCHRONIZER FAS-115DG	1
FLK14EZDR100	CABLE FLK14/EZ-DR/100/KONFEK	1
FLK14EZDR200	CABLE FLK14/EZ-DR/200/KONFEK	1
FLK50EZDR150	CABLE FLK 50/EZ-DR/ 150/KONFEK	1
FLK50EZDR200	CABLE FLK 50/EZ-DR/ 200/KONFEK	1
FLKM14PAS300	FRONT CONNECTOR FLKM 14-PA-S300	2
FLKM50PAS300	FRONT CONNECTOR FLKM 50-PA-S300	2
FQ1207	DOUBLE VOLTMETER FQ 1207	1
FQD96	DOUBLE FREQUENCY METER FQD96	1
K1D024MKBC1B	CONTROL SWITCH K1D024M+KBC1B	1
KLH24VDC	SIGNAL HORN KLH; AUX: 24VDC	1
MULTI9C60N1C4	MCB MULTI9 C60N 1C4	6

PI25124VDC	POSITION INDICATOR PI25-1 / 24VDC	1
PI25224VDC	POSITION INDICATOR PI25-2 / 24VDC	2
PLCRSC24DC21	AUX. RELAY + BASE PLC-RSC-24 DC/21	10
PLCV8FLK14IOUT	TERMINAL BLOCK PLC-V8/FLK14/IOUT	2
S3-S	CONNECTION BASE S3-S	20
SQZE96	SYNCHRONOSCOPE WITH CHECK SYNC RELAY	1
UM45FLK50	TERMINAL BLOCK UM 45-FLK50/32IM/PLC	1
VAMP2105D7BAA	GENERATOR PROT. RELAY VAMP 210-5D7BAA; AUX:24VDC	1
VAMP2605C7BAA	POWER MONITORING UNIT VAMP 260-5C7BAA	1
VAMP2655D7BAA	GENERATOR DIFF. RELAY VAMP 265-5D7BAA; AUX:24VDC	1
WDU4	TERMINAL WDU 4	50
WSI6100MA	FUSE TERMINAL BLOCKS WSI 6 LD 24VDC; FUSE: 100MA	10
WSI624	FUSE TERMINAL BLOCKS WSI 6 LD 24VDC; FUSE: 1A	10
WTL61	TERMINAL BLOCKS WTL 6/1	10
XPSAR24VDC	SAFETY RELAY XPS-AR; AUX V: 24VDC	1
ZB5AA1ZB5AZ101	PUSH BUTTON ZB5-AA1+ZB5-AZ101	1
ZB5AA3AZB5Z101	PUSH BUTTON ZB5-AA3+ZB5-AZ101	1
ZB5AD2ZB5AZ103	CONTROL SWITCH + HANDLE; ZB5-AD2+ZB5-AZ103	1
ZB5AD3ZB5AZ103	CONTROL SWITCH + HANDLE; ZB5-AD3+ZB5-AZ103	1
ZB5AD3ZB5AZ1034X	CONTROL SWITCH ZB5-AD3+ZB5-AZ103+ 4 x ZBE-101	1
ZB5AD5ZB5AZ103	CONTROL SWITCH ZB5-AD5+ZB5-AZ103	3
ZB5AK1413ZB5AW	CONTROL SWITCH ZB5-AK1413+ZB5-AW0B13	1
ZB5AL8434	PUSH BUTTON ZB5-AL8434+ZB5-AZ103	2
ZB5AW313;	LIGHT PUSH-BUTTON ZB5-AW313+ZB5-AW0B11	3
ZB5AW313AW	LIGHT PUSH-BUTTON ZB5-AW313+ZB5-AW0B12	3
ZB5AW343	LIGHT PUSH BUTTON ZB5-AW343+ZB5-AW0B41	1
ZB5AW353	LIGHT PUSH-BUTTON ZB5-AW353+ZB5-AW0B51	1
ZB5AZ101	BODY ZB5-AZ101	3
ZB5AZ103	BODY ZB5-AZ103	3
ZB5AZ104ZB5BS54	EMERGENCY STOP PUSH BUTTON ZB5-AZ104+ZB5-AS54	1
ZBE-101	CONTACT BLOCK ZBE-101	3

System**3xAUX-CFC- Generating set control panel Generating set control panel VEO****Safety spare parts**

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
140ACO02000	ANALOG OUTPUT 140 ACO 020 00; 4 CHANNELS, 24VDC	1
140CPS52400	POWER SUPPLY 140 CPS 524 00	1
140CPU65150	CPU 140 CPU 651 50	1
140CRP93100	RIO HEAD MODULE 140 CRP 931 00	1
140DDI35300	DIGITAL INPUT 140 DDI 353 00	2
140DDO35300	DIGITAL OUTPUT 140 DDO 353 00	1
140NOE77101	ETHERNET CARD 140 NOE 771 01	1
140XTS00200	TERMINAL STRIP 140 XTS 002 00	1
1SNA631025R1400	DIGITAL INPUT MODULE BOM-16-B; 1SNA631025R1400	2
BE913800/110	VOLTAGE METER BE96; 13800/110V; 0-20KV	1
BE96	RPM- METER BE96; 4-20MA, 0-1000 RPM, 0-30000 RPM	1
BE9642005105	POWER FACTOR METER BE96; 4-20MA= 0,5-1-0,5CAP-IND	1
BE96420MA4016	REACTIVE POWER METER BE96; 4-20MA= -4-0-16 MVAR	1
BE96420MA=0-20	ACTIVE POWER METER BE96; 4-20MA = 0-20MW	1
BE9655-65HZ110	FREQUENCY METER BE96; 110V; 55-65HZ	1
BE96;1000/5A	CURRENT METER BE96; 1000/5A, 1000/2000A	1
E27240V60W	BULB E27; 240V 60W	1
GARDOMAX60W	PANEL LIGHT GARDOMAX; MAX 60W	1
P22061049219M1	SWITCH P220-61049-219M1; ENG., TURBO A, TURBO B	1
P22061312219M1	SWITCH P220-61312-219M1; 0, L1-L2, L2-L3, L3-L1	1
PT3P7615115VAC	AC-AUXILIARY RELAY PT 3P7615 115 VAC	1
PT5D7110110VDC	DC-AUXILIARY RELAY PT 5D7110 110 VDC	7
QUINTPS1AC24DC5	DC POWER SUPPLY QUINT-PS/1AC/24DC/5	1
S201-C1	MCB S201-C1	2
S202-C 2	MCB S 202-C 2	2
S202-C4	MCB S202-C4	2
S2C-H6R	AUXILIARY CONTACT S 2C-H6R	2
S506100RB100MA	TUBE FUSE S506-100-R-B; 100MA, 5X20MM	10
SK311650120W	HEATER SK3116; 50/120W	1
VAMP2105A7AHC	GENERATOR PROTECTION RELAY VAMP 210-5A7AHC	1
VAMP2605C7AHC	PMU VAMP 260-5C7AHC	1
VAMP2655A7AHC	GENERATOR DIFFERENTIAL RELAY VAMP 265-5A7AHC AUX	1
WDU4	TERMINAL WDU 4	50
WTL 6/1 EN STB	TERMINAL WTL 6/1/ EN STB	20
XRFE16124	DIGITAL RELAY OUTPUT MODULE XRFE16124	1
ZB5AS844REDZB5	EMERGENCY STOP BUTTON ZB5-AS844; ZB5-AZ104; ZHS	1

System

1xAUX-Station auxiliary transformer Station auxiliary transformer KTPU

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
DGPT2	DGPT2 PROTECTION DEVICE	1
DT3150	LV-BUSHING DT3150	1
NLTD 24B 250	HV BUSHING NLTD 24B 250	1
YRFA2	PRESSURE RELIEF DEVICE YRFA2	1

System

3xAUX-Frequency converters NXC03005A2H (Ventilation auxiliary side)

Safety spare parts

<u>Part number</u>	<u>Description</u>	<u>Quantity</u>
60PP01080	MAIN FAN KIT NXS SERIES	1
60SVB00761	CONTROL BOARD	1
NXC03005A2H	FREQUENCY CONVERTER	1

APPENDIX 2.B

TOOLS AND EQUIPMENT

Owner to supply special tools provided under the EPC.

Part Number	Description	Qty
800004	Turning tool for main bearing shell	1
800005	Turning tool for thrust bearing shell	1
800007	Lifting tool for cylinder liner	1
800008	Honing equipment deglazing machine	1
800009	Dismounting tool for anti-polishing ring	1
800203	Grinding tool	1
800012	Lifting tool for piston	1
800001	Piston ring pliers 320	1
800201	Fitters tool for piston	1
800002	Pliers for retaining ring ZGJ-5+ZSJ51	1
800160	Jack for piston	1
800016	Mounting and dismounting tool for connecting rod	1
800107	Protecting sleeve for connecting rod tooth	1
800018	Limiter for piston	1
800020	Hydraulic tools M27x2	2
800021	Mounting device for M27x2 stud	1
800022	Pin for tightening of nuts M27x2	1
800024	Assembly tool for intermediate gear	1
800142	Lifting tool for cylinder head	1
800027	Presser for valve springs	1
800028	Turning tool for grinding of valves	1

800029	Removing device for inj.valve	1
800146	Adapter M16	1
800126	Extraction mandrel for valve guide	1
800030	Valve clearance gauge feeler	1
848115	Valve clearance gauge feeler (0.65 for pcc valve)	1
846202	Lifting tool for rocker arms bracket	1
800218	Cleaning tool for sealing surface in prechamber	1
820011	Socket for spark plug	1
820013	Lifting tool for PCC	1
820000	Torque wrench 20-100 Nm	1
820012	Torque wrench 730/4 8-40NM	1
846200	Assembly tool for prechamber valve	1
847022	Pressure test device for prechamber	1
800234	Assembly tool for PCC	1
800040	Hydraulic cylinder set for M42 861201,800044, 042,&861055	1
800042	Distance sleeves	2
800043	Pin for tightening of nuts M42	1
800044	Mounting device for M42 stud	1
861055	Distance sleeve	2
861201	Elbow union for tightening tool	2
800310	Hydraulic cylinder (for main bearings)	2
800300	Hydraulic cylinder (for cylinder heads)	4
800305	Extractor tool	1
800049	Pin for tightening of nuts	1
800304	Lifting tool for hydraulic cylinders	1
800051	Lifting tool for hydraulic cylinder	1
800053	Hand pump	1

800200	Flexible hose	3
800056	Flexible hose	2
800059	Low pressure pump	1
800289	Flexible hose	2
800062	Mounting and removing device for camshaft bearing bush	1
848020	Checking device for cylinder / valves tightness	1
800065	Deflection indicator	1
800067	Securing pin for valve tappet	20
832010	Lifting device for guide block	1
800068	Lifting eye bolt M12	1
800069	Lifting eye bolt M16	1
800074	Wrench for centrifugal filter	1
806032	Hexagon socket screw Bit (17 mm.), 3/4" square drive	1
800283	Box wrench head 21	1
800122	Extractor plate for holder of thermostat element	1
837055	Extractor for impeller of water pump	1
800141	Tool for cyl. Liner temp	1
846222	Mounting tool for charge air cooler	1
806085	Hex. Socket screw plug 14 mm	1
800109	PRESSURE TESTING DEVICE FOR CYLINDER HEAD1	1
847047	TEST PRESS. PUMP	1
800312	TURBO Tool box	1

APPENDIX 2.C

OFFICE EQUIPMENT

No office equipment provided by Operator. It is expected that Owner furnishes the offices at the W34LPG power station.

APPENDIX 3

PERFORMANCE FIGURES AND GUARANTEES

1. ANNUAL AVAILABILITY

1.1.1 Annual Availability Guarantee for each Wartsila Generator Set

Starting from the Effective Date, the Operator guarantees an Annual Availability for each of the Wartsila Generator Sets of the Power Station of ninety three percent (93%) in the Operating Year; provided, that in any Operating Year in which the 32,000 and 48,000 Engine Running Hour overhaul occurs for one or more Wartsila Generator Sets, the guaranteed Annual Availability for that engine is ninety percent (90%). The Annual Availability shall be calculated in accordance with the formula set forth in Section 1.1.2 below.

The Available Hours shall include hours when the equipment is unavailable due to any of the following:

- i. Facility was disconnected from the grid or any failure or restrictions in the grid;
- ii. Facility was not dispatched due to Owner's dispatch instructions;
- iii. an event arising out of or relating to a acts or omissions by the Owner or third parties (including authorities) which has an impact on the performance of the Facility;
- iv. an event arising out of operating media being non-conforming with OEM specifications;
- v. an event of Force Majeure;
- vi. an event of Change of Law adversely impacting or limiting engine operation;
- vii. an event arising out from Excluded Equipment;
- viii. an event arising out from Owner installed third party equipment adversely impacting or limiting engine operation;
- ix. a suspension of Work by the Operator in accordance with Section 7.7 of the Shared Operations and Maintenance Agreement; and
- x. an event arising out of not having an established workshop at the Facility.

For clarity, any hours where the Generator Sets were subject to the carve outs itemized above, will be counted as stand-by hours (available but not generating) in the Annual Availability calculation. Notwithstanding the foregoing, the Balance of Plant, specific for each Generator Set, must be ready and available for immediate operation per design.

1.1.2 Annual Availability Formula

The Annual Availability ("**AA**") shall be calculated according to the IEEE 762-2006 standard and expressed as a percentage (%) for each Wartsila Generator Set:

Availability = Running Hours + Standby Hours / Period Hours.

Period Hours = 8760 hours, except in a leap year the Period Hours = 8784 hours

2. HEAT RATE GUARANTEE

Starting from the Effective Date, the Operator guarantees that the Heat Rate measured running on LPG, based on the measurement of the heat rate per one engine during the performance tests, at the reference conditions (site conditions) as stipulated in Appendix 4 and operated at the condition as stipulated in Table 1, and expressed in Btu/kWh as stipulated in Table 2 is 8282 Btu/kWh plus a 1.5% degradation factor.

Table 1. Conditions at 100 % load and 0.8 power factor

<u>Objective</u>	<u>Value</u>	<u>Units</u>	<u>Target</u>
Electrical Power Output, W20V34LPG	7027	kWe	Measured at the Generator terminals

Table 2. Guaranteed Performance Values at 0.8 power factor

<u>Objective</u>	<u>Value</u>	<u>Units</u>	<u>Target</u>
Heat rate, W20V34LPG	8282	Btu / kWh, at LHV	Measured at the Generator terminals

Table 3. Correction factor for guaranteed Heat Rate value

<u>Objective</u>	<u>Value</u>	<u>Units</u>	<u>Valid for electrical outputs at generator terminals (kWe)</u>
Correction factor for heat rate, W20V34LPG	0.048	Btu / kWh per kWe	5950 - 7027

If the Electrical Power Output stipulated in Table 1 can't be reached during the performance tests, the Heat Rate guarantee value in Table 2 is increased by the value unit stipulated in Table 3 per reduced Electrical Power Output measured per kW. This is valid for Electrical Power Outputs stipulated in Table 3.

Example: Electrical Power Output during performance tests 6,000 kW on W20V34LPG->
Guaranteed heat rate: $8282 + (0.048 \times (7027 - 6000)) = 8331.3 \text{ Btu/kWh}$

3. Lube Oil Consumption Guarantee

The Wartsila 34SG LPG Generator sets shall not exceed the average gross Lube Oil Consumption in a year shall not exceed 0.50 g/kWh generated at the generator terminals.

4. ELECTRICAL CAPACITY GUARANTEE

For the Wartsila 34SG LPG Generator Sets, the Electrical Capacity Guarantee shall equal the value measured in the Construction Contract performance test.

5. EMISSION GUARANTEE

For the Wartsila 34SG LPG Generator Sets, the emissions will not exceed the emissions limitations set forth in the Emissions Statement below and the Stack Emissions Test conducted under the Construction Contract as documented in the Performance Test Certificate, whichever is higher.

Please pay special attention to page 3 of Document DBAE031595, section named as "Time to reach compliance". There is an error that needs to be fixed. The section indicates that emission guarantees are to be reached after 30 minutes after start up. Wartsila Operator Clarified to Owner WAPA during the RFP-Q&A that just for the case of a cold start of the Regenerative Thermal Oxidation device that controls the Volatile Organic Compound in the combustion gases reaches 2 to 3 days (48 to 72 hours), page 8 of Clarification Document.

Attached:

Document DBAE031595

Clarification Document

[Place holder for Document DBA031595 and Clarification Document]

**CONFIDENTIAL Emission statement**

Title:	Emission guarantees for USVI	Doc.ID:	DBAE031595
		Revision:	g
Author:	Hanna Strandberg	Status:	Finalised
Finalised by:	Eirik Linde / 21.02.2017	Pages:	1 (4)
Organisation:	- General Energy Solutions		
Project:	- Project information		

This document provides flue gas emissions, i.e. maximum average values for emissions measured over a period of minimum 60 minutes. The emissions are based on the site conditions, gas composition and measurement methods specified in this document.

Engine: Wärtsilä® 20V34LPG, 720 rpm (constant speed)

Site conditions:

Altitude	up to 100 m above sea level
Ambient temperature	20-35 °C
Humidity ratio	6-25 g _{water} /kg _{dry air}

Gas composition:

The emissions are valid within the limits of the gas composition given in the table below which also represents the maximum and minimum limits for LPG fuel characteristics for the Wartsila W34LPG engine. It is understood that variations in the gas composition inside this specification will occur and are permitted; however sudden extreme changes in gas temperature, pressure or composition are not allowed.

Property	Unit	Limit
Methane (CH ₄) + Ethane (C ₂ H ₆) + Propane (C ₃ H ₈) content, min.	% v/v	97.0
Propane (C ₃ H ₈) content, min.	% v/v	90.0
Butanes and heavier alkanes, max	% v/v	3.0
Pentanes and heavier alkanes, max	% v/v	1.0
Total alkenes, max.	% v/v	2.0
C4+ alkenes, max	% v/v	0.5
Hydrogen sulphide (H ₂ S) content, max.	% v/v	0.05
Total sulphur, max S	mg/kg	5.0
Water and hydrocarbon condensate bef. engine ^{a)}		Not allowed

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Ammonia content, max.	mg/m ³ _N	25
Chlorine + Fluorine content, max.	mg/m ³ _N	50
Particles or solids content in engine inlet, max.	mg/m ³ _N	50
Particles or solids size in engine inlet, max.	μm	5
Copper strip corrosion, max.	Rating	No. 1
Gas inlet temperature, max ^{b)}	°C	60

a) *In the specified operating conditions (temperature and pressure) dew point of gas has to be low enough in order to prevent any formation of condensate.*

b) *Minimum temperature limited by formation of condensate.*

Aromatic hydrocarbons (total max 100 mg/m³_N)

Silicon-based compounds (total max 1 mg/m³_N as Silica)

Concentrations of Aromatic hydrocarbons and Silica based compounds demonstrated by the following detection methodology: SMA11m (ATDGCMS analysis).

m³_N defined at 0°C and 101.325 kPa (abs.)

In the event flue gas emissions are encountered in excess of the limits set forth herein, without in any way excusing the Contractor from its obligation to meet the emissions guarantee set forth herein, in the event the Contractor can demonstrate to Owner's reasonable satisfaction that such excess emissions result from the presence in the LPG of aromatic hydrocarbons or silicon-based compounds in excess of the amounts set forth immediately above, the Parties agree to work together to determine the most efficient and cost effective way to reduce such emissions to ensure they fall within the limits set forth herein.

Lubricating oil quality according to Wärtsilä specifications for gas engines, in accordance with Appendix 25.

Maximum start-up emissions per engine during start-up period (30 min):

VOC (as C₃H₈): 10 lb/start

NO_x (as NO₂): 5 lb/start

Flue gas emissions after emission control system¹ for any operating hour at any and all loads between 40 and 100% per engine:

¹ Emission control system is RTO (Recuperative Thermal Oxidizer). Minimum allowed engine load equipped with emission control system is 40%.

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Load	%	100
NOx (as NO ₂)	lb/h	3.6
CO	lb/h	5
VOC (as C ₃ H ₈)	lb/h	1.28
PM ₁₀ (total)	lb/h	1.3

Time to reach compliance

Compliance with emission data in this document will be reached within 30 minutes from start signal. The emission data in this document are given for all loads between 40 and 100%.

Measurement methods

Emission data provided in this document is based upon the emission measurement methods listed below and an approved EPA protocol.

Emission data assumes that individual compounds identified above the sensitivity limit, but at concentrations below the lower limit of detection are reported as maximum one-half of the daily lower-limit of calibration. Measurements shall be performed so that minimum feasible detection limits are achieved if this is required for determining compliance with emission guarantees.

The flue gas stack emission measurements will be performed at steady operating condition of the engine. Prior to the start of the flue gas emission (stack) measurements, the engine shall have reached steady state operating conditions and the flue gas temperature measured after the emission control system shall be allowed to reach normal operating temperature.

Compliance with the emissions limits will be based on an approved EPA protocol consisting of the EPA reference methods listed below and sampling for at least three 1-hour periods at 40, 75 and 100% loads for all pollutants.

Oxygen (O₂): EPA Method 3A (USA): Determination of Oxygen and Carbon Dioxide Emissions from Stationary Sources.

Nitrogen oxides (NO_x): EPA Method 7E (USA): Determination of nitrogen oxides from stationary sources.

Carbon monoxide (CO): EPA Method 10 (USA): Determination of carbon monoxide emissions from stationary sources.

VOC (Non-Methane, Non-Ethane Hydrocarbons): USA EPA Method 25A: Determination of total gaseous organic concentration using a flame ionisation analyser. None Methane None Ethane Hydrocarbons are defined as total hydrocarbons (THC) excluding methane and ethane.

PM₁₀ (total): Total PM₁₀ is defined as the sum of the particulate matter measured with a combination of EPA 5B and 202 methods. USA EPA Method 5B (front half): Determination of particulate emissions from stationary sources USA EPA Method 202 Determination of condensable particulate matter from stationary sources.

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- Based upon mutual written consent, evaluation of emission levels can be made using alternative methods.

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RFP 12-19

**VIWAPA RANDOLPH HARLEY POWER PLANT
EXPANSION – GENERAL CONSTRUCTION**

Clarification 2

CLARIFICATIONS / QUESTIONS FOR WARTSILA:

1) WAPA REQUEST

Reliability Requirements - Redundancy shall be provided for all pumps, motors, compressors, fans, and automatically actuated valves. Redundancy is also required on all lube, hydraulic and liquid fuel filtration skids

WARTSILA RESPONSE

Wärtsilä Response 23- January 2019:

Please see the requested Scope Of Supply list attached file name "Attachment for clarification No. 2 &10 , SOS submitted in the bid". There are two attachments in this file, one marked-up and one clean and revised to reflect the current situation

Please note that there is no space in the engine hall for a second starting air unit or maintenance water tank.

A summary of the SOS

- We have already installed 2 pcs of starting air vessels in phase I. We do not believe a new vessel is needed for phase II
- The Starting air header is common for the whole plant and it will be further extended for phase II
- Instrument air header is common for whole plant and instrument air units it will be extended to phase II
- We will have 2 pcs of instrument air compressors. One unit has already been installed in phase I and a second unit will be installed in phase II

Plant common equipment are as follows:

Mech:

- Starting air compressor
- Maintenance water tank
- Black start unit
- Lube oil tanks& pumps (tanks are installed in phase I)
- Fire-fighting system : The complete firefighting system was installed in phase I. However, additional fire detectors will be installed to the Engine hall section of engine 4 through engine 7.

New additional detectors will be connected to existing fire detection system and alarms will be indicated locally and in Randolph Harley Control room. We will also install in phase II hand held extinguishers

Elec:

- Common control panel
- MV SWG (Medium Voltage Switch Gear)
- LV SWG (Low Voltage) for common consumers + BSU supply (Black Start Unit) + back up supply
- Redundant 125 VDC system mainly for common consumers
- Gas detection system (For an engine hall to house 7 engines)
- Fire detection system (For an engine hall to house 7 engines)
- CCTV

WAPA's Subsequent Clarification / Response to Wartsila's January 28, 2019:

1. WARTSILA HAS INDICATED THAT THERE WILL BE NO ADDITIONAL LUBE OIL TANKS FOR THE ADDITIONAL UNITS 4-7. WAPA FAILS TO UNDERSTAND THE FUNCTIONING LOGIC OF THIS AND REQUESTS THAT WARTSILA EXPLAIN THIS REASONING.
2. ENGINE HALL 1 HAS A QUANTITY CCTV INSTALLED. WARTSILA TO INDICATE WHETHER THIS WILL BE DUPLICATED IN ENGINE HALL 2.
3. IN SECTION 7.6.8 WARTSILA IS TAKING EXCEPTIONS FOR LIGHTING PROTECTION AND OTHER RELATED ELEMENTS. ADDITIONAL LIGHTING AND OTHER COMPONENTS ARE NEEDED ASIDE FROM WHAT IS ALREADY INSTALLED DURING BUILDING CONSTRUCTION, WARTSILA'S SHOULD BE RESPONSIBLE FOR THIS SCOPE OF SUPPLY. (

WARTSILA Jan 30th 2019

Lightning Protection:

Lightning protection has been installed during previous phase of the project, hence it's not included in the offered expansion scope of supply, except lightning rod at the expansion scope Stack and related copper cable, to connect that rod to existing earthing network.

Cost of this lightning rod and copper cable is included in the electrical material & installation cost provided by Wartsila in the bid response.

Lights:

Lights have already been installed during phase 1 of the project, therefore the offered phase 2 scope of supply will include the following lighting installation:

- 1) Lights at expansion Generating sets Maintenance platforms
- 2) Lights at expansion scope Stack
- 3) Lights at expansion scope Radiators

Cost of this lighting scope was already included in the electrical material & installation cost provided by Wartsila in the bid response.

4. WARTSILA HAS INDICATED THAT AN ADDITIONAL STARTING AIR COMPRESSOR WILL NOT BE SUPPLIED. WAPA REQUESTING AN ADDITIONAL AIR RECEIVER TO BE PART OF WARTSILA'S SCOPE OF SUPPLY FOR RELIABLE STARTING CAPABILITY.

WARTSILA Jan 30th 2019

Price of starting air compressor is not the issue. Apparently there is no space available for a second unit or for extra starting air bottles.

The already installed starting air vessels (2 x 4,8 m³) and starting air compressors was dimensioned for a 7 engine power plant. Meaning we have considered the fact that there will be an eventual build out of seven engines. Starting air units are not designed to run continuously and our experience dictates that with proper service and maintenance frequent starting and stopping of engines will have minimal to no impact on the units.

2) WAPA REQUEST

Operational Requirements - The units are capable of operating on any mixture of LPG and ULSD from 100% LPG to 100% ULSD and be capable of transferring, preferably under load, between the two during operation.

WARTSILA RESPONSE

None.

CLARIFICATION

No specifications noted on operating parameters between different fuels or transfer capabilities. Wartsila must comply with the RFP by responding favorably to the statement.

(Wärtsilä response 07-01-2019):

Engine starts/stops on ULSD. Transfer is continuous seam-less (mixing 3 port control valve) ULSD to LPG, or at any mixture ratio for the function of the engine. (Emissions not given for mixed fuels.) Fuel transfers can be initiated anywhere in side 20-100% loaded condition.

Wärtsilä Response 23- January 2019:

Analog controlled 4-20 mA Mixing Valve
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LG engine has a pilot line for LFO, this amount and timing is independently controlled from the main fuel line. Amount is designed to be 1% of energy need at 100% load normal operation. The pilot fuel is always activated during normal running of the LG engine. However we defined that the pilot is and going to be tuned towards 1%, but as we can have different fuels and performance requirements we stipulated 5% pilot to be sure to have a working engine and enough LFO storage at site.

During start-up the pilot line is used for the start, and cylinder temperature check verifies the pilot function.

Before start of main pump LFO is chosen on the mixing valve, as load increases mixing valve will stay in LFO position unless LPG has been chosen as main fuel.

Changing LFO to LPG is a smooth ramp to change mixing valve to LPG 100%, or any other mixing chosen. 60/40% LPG/LFO.

For further details on the LG engine please see the attached LG engine white paper.

WAPA's Subsequent Response to Wartsila's January 28, 2019:

WARTSILA HAS FAILED TO PROVIDE THE REQUESTED INFORMATION FOR OPERATING CAPABILITIES FOR FUEL TRANSFERS FROM LPG TO LFO. WAPA WILL HAVE NO CHOICE BUT TO CONSIDER THAT THESE UNITS DO NOT HAVE THE CAPABILITY OF TRANSFERRING FROM LPG TO LFO ON THE FLY (SEAMLESSLY). THIS LACK OF CAPABILITY WILL HAVE TO BE STUDIED IN DEPTH AS TO MEETING THE RELIABILITY NEEDS OF RHPP.

Wartsila Response Jan 30th 2019

The units DO have the capability of transferring from LPG to LFO and vice versa seamlessly – and can also run on mixtures of both fuels. In fact the switch-over process happens in a couple of minutes without interruptions to the unit.

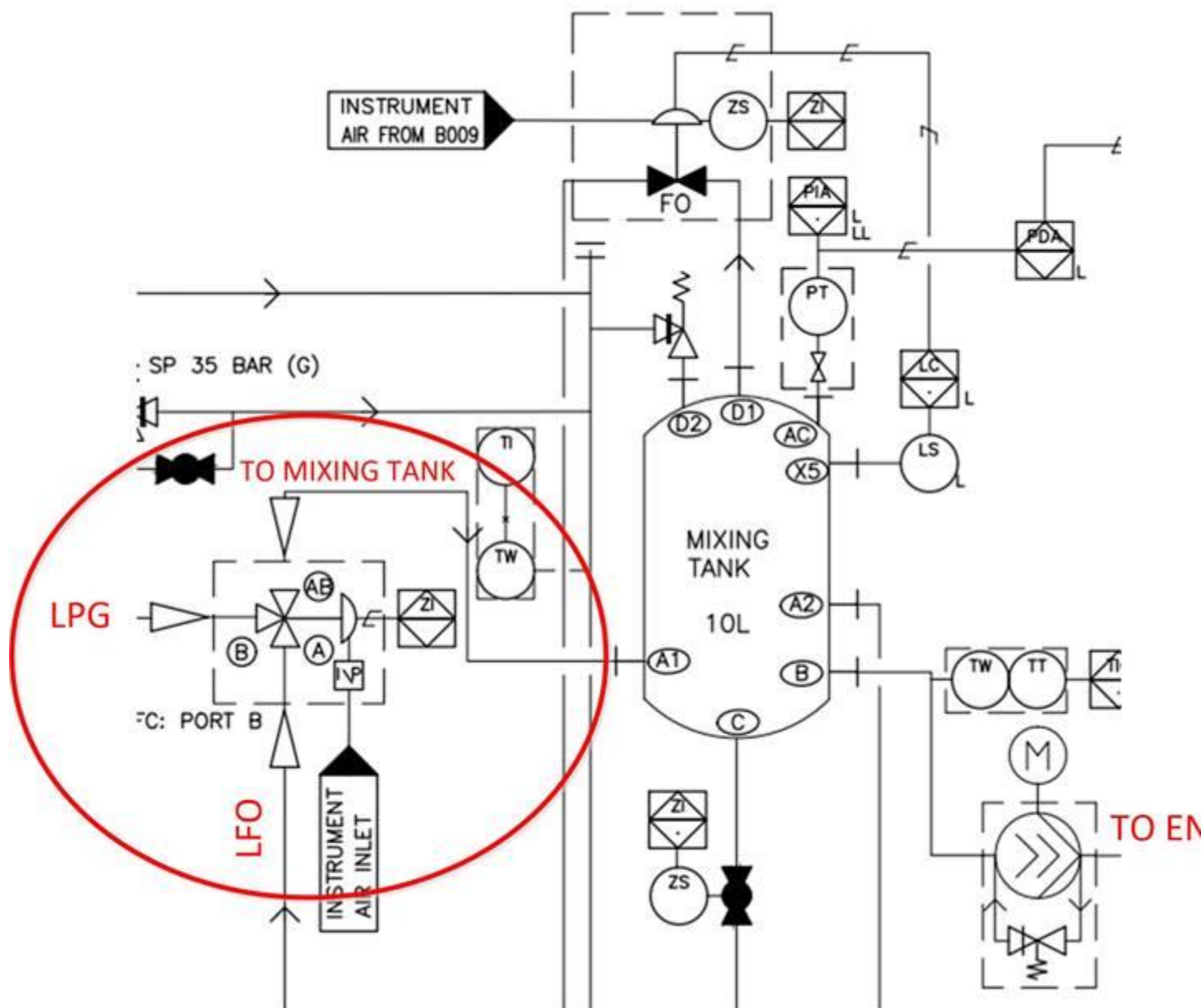
The selection of the main fuel is done from the operator's work station (in the form of % of LPG or LFO (like eg. 30/70, 50/50, 90/10 or similar).

This command, given by the operator, physically switches over a 3-way valve in the fuel feed (booster module): The valve has 2 inputs for different fuels, and one output towards the engine. As it is a 3-way valve – the output is the sum of both inputs.

The physical valve has the ability to switch over instantly – but will be programmed to gradually go from one position to the other as a smooth operation takes place.

During normal (planned) operations, starts and stops – this smoothened operation is in place, but should there be a sudden loss of fuel (pressure) – the mixing valve will be changed over instantly to the other fuel avoiding any interruption to the operations (The remaining volume downstream from the valve will still smoothen out the change of fuel that reaches the engine).

Please see picture below:



3) WAPA REQUEST

(Wärtsilä response 23-01-2019):

The complete firefighting system was installed in phase I. However, additional fire detectors will be installed to the Engine hall section of engine 4 through engine 7. New additional detectors will be connected to existing fire detection system and alarms will be indicated locally and in Randolph Harley Control room. We will also install in phase II hand held extinguishers

WAPA

Gas Detection and Protection - Systems shall be installed in areas for which flammable or toxic gasses have the potential to accumulate in hazardous concentrations. Where gas detection systems are installed, they must be equipped with both local and remote alarm notification from the Randolph Harley Control Room.

WARTSILA RESPONSE

The gas detectors are located where the fuel gas is present and may cause gas cloud build-up in case of a leak (typically indoor, closed spaces). For alarming purposes combined sounder beacons are located at easily heard or seen locations inside the detection area and outside above the entrance.

CLARIFICATION

Wartsila has no mention of remote notification to Harley Control Room. Wartsila must respond to the requirements of the RFP.

(Wärtsilä response 07-01-2019):

Offered Scope of Supply does not include fire nor gas detection systems, except few addition sensors for offered additional units. Existing Gas & Fire detection system has annunciators in the existing Control Room.

WAPA's Subsequent Response to Wartsila's January 28, 2019:

THIS RESPONSE CONFLICTS TO WARTSILA'S RESPONSE TO QUESTION 5, AND ALSO THE REQUIREMENTS OF THE RFP. PER THE RFP, UNITS 4-7 MUST HAVE GAS AND FIRE DETECTION AND REMOTE NOTIFICATION.

(Question closed)

4) WAPA REQUEST

CLARIFICATION

What is the power demand required from each Vocsidizer electrical heater? What is the estimated duration to attain required temperature for each cold start?

Wärtsilä response 07-01-2019):

Preliminary design is with 290 kW electrical heating elements for initial start-up of each Vocsidizer unit. Initial start-up heating takes 2-3 days. In normal operation including stand by and maintenance the unit is not allowed to cool down. Stand by heating is done by regularly passing a propane air mixture through the bed, when the propane is oxidised it releases heat to the bed.

Wärtsilä Response 23- January 2019:

Expected average standby heating need (after about 8h or more in standby) is about 180-200 kW gas and 2 kW electricity (dilution fan). Stand by heating is done by passing a dilute LPG – air mixture through the bed where it is oxidised and releases the oxidation energy to the bed. During this process the heat profile in the bed is also concentrated back to the middle. The flow direction is changed with gas feed turned off and will thus not cause any slip of unburnt VOC.

WAPA's Subsequent Response to Wartsila's January 28, 2019:

FROM THE INFORMATION WARTSILA PROVIDED IN THEIR JANUARY 23, 2019 RESPONSE TO THIS QUESTION, IT APPEARS THAT WARTSILA WILL USE A COMBINATION OF PROPANE GAS AND SOME ELECTRICITY FROM THE (COIL OR, AND FAN) TO MAINTAIN THE BED TEMPERATURE OF THE RTO IN A STANDBY MODE. PLEASE PROVIDE THE PROPANE USAGE RATE DURING THE STANDBY PERIODS. CALCULATE USAGE FOR A ONE WEEK PERIOD WHEN THE UNIT IS ON STANDBY.

Wartsila Response Jan 30th 2019

In standby mode the temperature of the bed is controlled by periodically passing a lean mixture of Propane and air through the bed. The oxidation of the Propane releases the needed energy to keep the bed hot. On average ,the standby consumption for a unit is approximately 15 kg/h, giving an estimated consumption of 10 t/week for 4 units in standby. Electricity is consumed by the electric fan used for diluting and distributing the propane evenly over the bed

5) WAPA REQUEST

Emissions Requirements - Supply of an oxidation catalyst system for VOC reduction.

CLARIFICATION

What fuel is used in the Vocsidiser and what would be the worst case amount used if it the fuel is needed. (i.e. usage on a monthly basis?)

(Wärtsilä response 07-01-2019):

Fuel is LPG:

With the preliminary RTO design the auto thermal need for each Vocsidizer is calculated to be 660 kW at full engine load, a major part of this energy is assumed to come from direct LPG injection in LG engine application as the concentration of CO and VOC in the exhaust gas is low. The actual Vocsidizer LPG consumption would be approx. 50kg/h (208,5 BTU/KWh) per unit per month at 100% base load. Note that given plant net heat rate and emission guarantees includes this LPG fuel consumption and it should be considered as a part of the total plant balance.

WAPA's Subsequent Response to Wartsila's January 23, 2019:

(110 LBS/HR?) PLEASE CONFIRM THIS IS THE MAXIMUM REQUIRED LPG FLOW REQUIRED TO MAINTAIN THE REQUIRED BED TEMPERATURE OF 900-1000 DEGC.

(Question closed)

6) WARTSILA COMPRESSED AIR SYSTEM

(Wärtsilä response 07-01-2019):

Offered Scope of Supply does not include Starting Air Compressor, existing starting air compressors will be utilized for offered generating sets.

Anyhow, offered scope of supply include one instrumentation air compressor, compressor size will be the same as the one already installed for previous plant.

WAPA REQUESTING OVERHAUL AND INSPECTION REQUIREMENTS FOR THE STARTING COMPRESSOR FROM THE COMPRESSOR OEM. WHAT IS THE DUTY CYCLE OF THIS COMPRESSOR?

Wartsila Response Jan 30 2019

Please see attached installed compressor manual, from page 13 service intervals can be seen.

7) CLARIFICATION

VIWAPA is requesting any emissions and other data on the machines being supplied from either other machines in service elsewhere or, if this is a newly configured machine without a long in service history, the test machine used to validate the design and measure performance. This would include emissions data with or without an SCR.

(Wärtsilä response 07-01-2019):

Initial emission data collected at engine test bed operating on LFO, shows that W32LG engine emissions are well in line with the figures presented in the *“Wärtsilä 32LG Engine for WAPA Power Plant in St. Thomas, USVI Background, Performance, Emissions, and Emissions abatement Strategies”* paper submitted by Wärtsilä for the *“Preliminary information briefing package”* (dated: June 28, 2017) prepared by Arcadis.

WAPA’s Subsequent Response to Wartsila’s January 28, 2019:

IN A RELATED QUESTION (REFERENCE PARAGRAPH 11 AND RESPONSE DATED, JANUARY 7, 2019), WE WOULD LIKE TO SEE SUPPORTING DATA AND BASIS FOR THE EMISSIONS ESTIMATES THAT WOULD INCLUDE A COMBUSTION AIR BLOWER (or IDLING AIR FAN) AND PROPANE ADDED AS SUPPLEMENTAL HEAT INTO AN RTO. THE REFERENCE TO THE BACKGROUND PAPER IN YOUR RESPONSE DOES NOT RESPOND TO OUR QUESTION. IT ONLY SPEAKS OF THE UNIT EMISSIONS, NOT THE ADDITIONAL EMISSIONS ASSOCIATED WITH THE RTO. DATA FROM THE OSKARSHAMN TEST UNIT REQUESTED.

(Question closed)

8) CLARIFICATION

Wärtsilä Response 23- January 2019:

Correction to the our response of 07-01-2019 . For phase 2 we will not rely solely on the existing soil investigation report since we now know that the actual site condition is not exactly what was reported in the report. Based on our experience in phase 1, the site conditions at the expansion area (the area where we will be piling for phase 2), specifically the load bearing layer in this area, is approximately at 15 meters depth. With this fact, we have based our proposal pricing assuming piling lengths based on load bearing stratum being at the level of -15 meter from the Foundation surface of the exiting engine hall floor level.

Wartsila Response Jan 30th 2019

We can agree that the reference point for pile length will be at the ground level plus (+) 100 mm (since the piles are embedded inside the foundation by this amount).

WAPA's Subsequent Response to Wartsila's January 28, 2019:

WARTSILA'S OFFERED SCOPE OF SUPPLY NEEDS TO BE BASED ON THE KNOWN SOIL INVESTIGATION CONDUCTED DURING UNITS 1-3 CONSTRUCTION.

9) CLARIFICATION (AS OF JANUARY 25)

Considering the heat source for the RTO, and the mechanical means to re-direct flow & purge, please describe the annual expected maintenance costs associated with the Megtec RTOs specifically. Please express in \$/year. Also, please advise of Megtec's recommended maintenance intervals, e.g., every quarter, yearly for certain components, downtime duration etc. (Question closed)

10) CLARIFICATION (AS OF JANUARY 25)

Will there be any other air emission sources, other than the stacks of the four 20V32LG engines that have already been permitted, that will exist at the new facility. This could include propane vents, other fan exhausts, etc. How is LPG venting or unburnt LPG handled? (Question closed)

11) CLARIFICATION (AS OF JANUARY 25)

The White Paper calls for LPG up to 2,000 bar for the 32LG. Current LPG stream at ambient and head pressure, how will Wartsila handle the delivery temperatures and pressures at the Unit? (Question closed)

12) CLARIFICATION (AS OF JANUARY 28)

QUESTION: if propane supply was lost during operation, how is the bed temperature maintained? Can the Unit(s) operate in environmental compliance?

Wartsila Response Jan 30th 2019

Due to the very low initial content of VOC and CO in the exhaust gas after the LG engine, additional energy in the form of Propane will have to be added to the Vocsidizer during operation to keep the bed temperature high enough to be able to reduce VOC and CO emission to the guaranteed levels. If the propane supply is lost environmental compliance can no longer be met (if no backup system is installed see #13).

13) CLARIFICATION (AS OF JANUARY 28)

QUESTION: if there is no propane available, will the units operate on LFO in environmental compliance?

Wartsila Response Jan 30th 2019

With the current offered solution, the operation on LFO is dependent on propane supply, in order for the Vocsidizer to remain in operation, to meet environmental compliance. The support fuel will have to be easily evaporated and distributed into the exhaust stream and because of this requirement LFO is not suitable for injection as a heating reagent. However, petrol, ethanol or methanol can be used for operation purposes (standby would need to be with installed electric coils since liquid fuels will have to be evaporated before it enters the vocsidizer), this would however require a separate injection and storage system to be installed. The possibility to have a dedicated propane or butane tank for LPG operation could be evaluated with the possibility of re-filling from local "household" supply chains, if main supply from LPG tanks is cut for longer periods.

Electrical heating of the bed is also possible but would require a totally revised design of the RTOs as the bed size would need to be increased (high impact on RTO cost) and most likely increased operation and stand by cost.

Please note that in an emergency situation it is possible to bypass the bed but both CO and VOC emissions will be out of compliance. We also checked if it would be possible to reach compliance in LFO mode with adding an oxidation catalyst to the SCR reactor (Vocsidizer in bypass and standby-electrical heaters on) but VOC emission would most likely be hard to meet and at least impossible to guarantee.

14) CLARIFICATION (AS OF JANUARY 28)

QUESTION: can the Units be dispatched readily in either Isoch or Droop Modes? (Question closed)

15) CLARIFICATION (AS OF JANUARY 28)

QUESTION: has Wartsila determined whether urea or ammonia will be utilized in the SCR? What type of inventory and safeguards would be required? (Question closed)

16) CLARIFICATION (AS OF JANUARY 28)

What is Megtec's recommended maintenance requirements and intervals for the RTO? Specifically the purge valve system and the reverse flow valve system. (Question closed)

17) What does it take to clean the bed if gets dirty and will it shorten the life of the bed.

Wartsila Response Jan 30th 2019

The bed consists of ceramic elements, these can if needed be removed, washed and replaced without loss of performance. If carefully handled, it should not reduce the bed life, if material is lost during the cleaning process, it can be replaced with new elements. If engines are properly maintained and operated with a fuel according to specification (ULSD) the bed is not supposed to need any regular mechanical cleaning. The ULSD will be the agreed USLD specifications in a contract once agreed by all parties.

APPENDIX 4

PERFORMANCE TEST GUIDELINES

[PLACE HOLDER FOR APPENDIX 4_PERFORMANCE TEST GUIDELINES]

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1 Objective

The Objective of the Gross Electrical Capacity test , Gross Heat Rate test and Exhaust Emission test is to demonstrate compliance of the equipment with the Performance Guarantees and Minimum Performance Standards as provided in the Contract Appendix 5 and is used for power and heat rate adjustment at site during performance test of the power plant. Calculations and symbols used in this document are based on ISO 15550, ISO3046-1 and ISO3046-3 standards.

2 Symbols

Symbol	Definition	Unit
P	Power = Capacity	kW
E	Electrical energy	kWh
LHV _{test}	Lower heating value of fuel during test	MJ/kg
R	Heat rate	kJ/kWh
Tt	Time	h
N	Number of periods in test	1
E _P	Electrical energy for power test	kWh
E _{hr}	Electrical energy for heat rate test	kWh
E _g	Electrical energy at generator terminals	kWh
E _o	Electrical energy for own consumption	kWh
E _{su}	High voltage transformer losses, energy	kWh
E _{hv}	Electrical energy at high voltage side of step up transformer	kWh
E _{mv}	Electrical energy at medium voltage side of step up transformer	kWh
F	Frequency	Hz
F _{measured}	Fuel energy, measured	kWh
m _{fmeasured}	Mass of fuel, measured	kg
m _{ftol}	Tolerance of fuel mass metering	%
EMU _{tol}	Tolerance of electrical energy measuring unit	%
LHV _{tol}	Tolerance of lower heating value of fuel	%
I _{transf, tol}	Tolerance of measuring transformer, current	%
U _{transf, tol}	Tolerance of measuring transformer, voltage	%

Prefixes

Δ	Difference, Tolerance
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Subscripts

X	Contractual reference conditions
Y	Test day conditions
M	Mechanical
measured	Measured value
guaranteed	Guaranteed value
min	Minimum
max	Maximum
average	Average

3 Measurements

Symbol	Definition	Measuring point	Unit	Wärtsilä Recommended Tolerance, max ¹⁾
p _x	Total barometric pressure	At engine air intake filter	kPa	± 0.2 %
t _x	Ambient air thermodynamic	At engine air intake filter	K	± 1 K

	temperature			
t_{cx}	Charge air coolant thermodynamic temperature	At charge air cooler inlet	K	± 1 K
$mf^{2)}$	Gas consumed	At gas flow meter	kg	± 1 %
LHV	Lower heating value	At gas flow meter	kJ/m^3	± 0.2 %
HHV	Higher heating value	At gas flow meter	kJ/m^3	± 0.2 %
E	Electrical energy	PMU / EMU ³⁾	kWh	± 0.5 %
Tt	Time	N/A	s	± 0.1 %

1) Wärtsilä recommends equipments with these accuracies, however actual tolerances of measuring equipment used during the test(s), shall be used for calculating Electrical Power and Heat Rate as per section 4.6 and 5.4 respectively.

2) Gas flow to be expressed at same reference conditions as the LHV. The reference conditions are described in Contract Exhibit 5 – Performance Guarantees.

3) This is the point of measurement as per agreement between the Contractor and Owner(Alternator terminals).

The Energy is measured using a PMU (Power Monitoring Measuring Unit) . The Power is calculated from the Energy for each test period.

$$P = E_p / t_t$$

$$\text{Where } E_p = E_g$$

$$E_{mv} = E_g - E_o \text{ and } E_{hv} = E_{mv} - E_{su}$$

4 Gross Electrical Capacity Test

4.1 General

The Gross Electrical Capacity Test is preferably done concurrently with the Heat Rate Test, during a 4 (four) hour period.

The engines involved in the test shall run for 2 (two) hours at full load prior to the start of the test in order to achieve stable conditions in all engine components and external systems.

Because there can be major variations in the ambient conditions during the full test period, it is important to split the full test period into shorter hourly test periods. These hourly test periods are then used to calculate the average of the full test. Please note that under no circumstances should an average of the ambient conditions prevailing over the full test period be used for the adjustment calculations.

For accuracy of the test it is important that all measurement readings are taken simultaneously.

The required measurements are done on an hourly basis and the readings recorded on a form. The period can differ somewhat from one hour without affecting the accuracy of the test. The electrical capacity is calculated from the produced electrical energy during each test period. The actual electrical capacity produced and actual gas consumed is naturally the sum of all the hourly test periods.

The guaranteed Electrical Capacity and Heat Rate for each hourly test period is adjusted for the ambient conditions prevailing and measured at the start of each hourly test period.

The final guaranteed Capacity and Heat Rate during the full test is the average of the adjusted Capacity and the corresponding heat rates, which are calculated separately for each hourly test period.

(Draft) Test Procedures

The point of measurement is at the respective Engine Control Panel PMU / Alternator Circuit Breaker , Fuel consumption is measured by Engine gas flow meters.

Only equipment required for normal operation of the plant shall be running during the test. Any redundant equipment shall be shut down. A list detailing which electrical consumers are connected during the test is included in section 6.

Should the test be interrupted by an event not attributed to the Contractor, the test shall be resumed promptly after the cause of the interruption has been removed. The test will resume when the operating levels matches that at the time prior to the trip, and shall continue for the time remaining to be completed at the time of the interruption.

4.2 Adjustment of Electrical Power for ambient conditions

The adjustment of electrical power for a gas engine is governed by a set of rules depicted by three power adjustment curves. The curve giving the lowest power shall be applied when determining the adjusted power.

4.2.1 Adjustment of power for ambient air temperature and site (total) barometric pressure

The Engine Power is fixed for a site barometric pressure, which is calculated from the site altitude. Variations in the site barometric pressure have no further impact on the power. Adjustment of power is calculated for the ambient air temperature as per the curve below.

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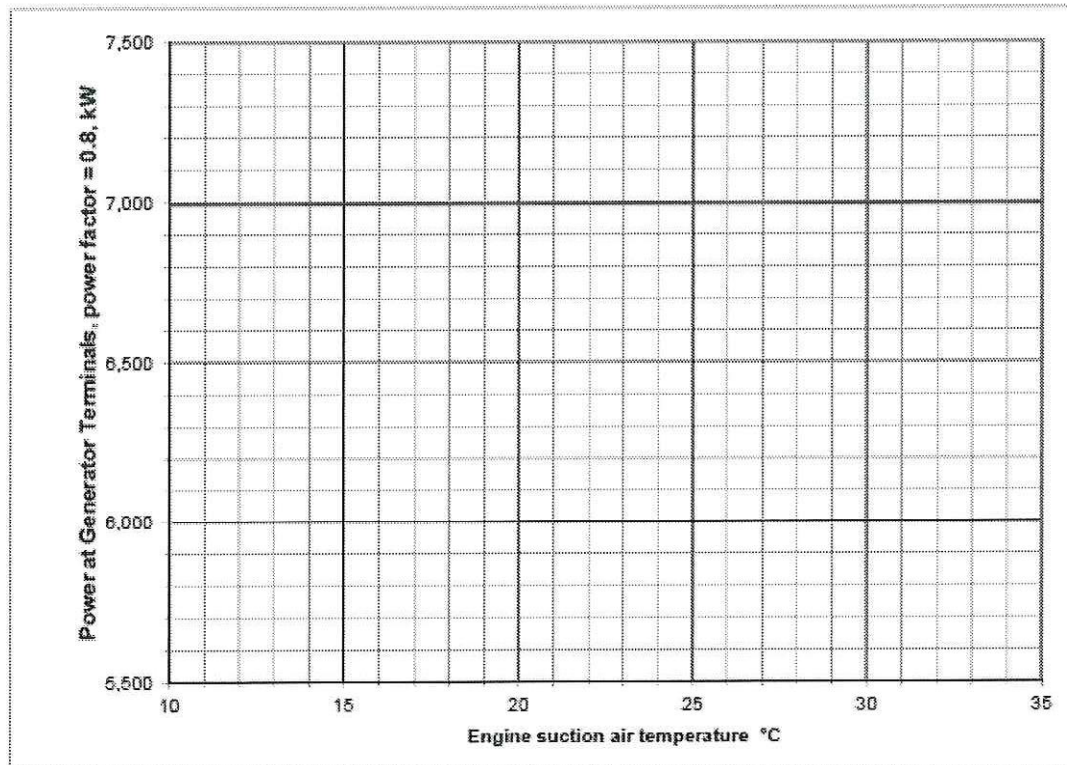


Gas engine power adjustment

Power limited by air temperature and pressure

Manufacturer	WARTSILA	Engine compression ratio	10
Engine type	W 20V34LPG	ISO power	kW 7200
Number of cylinders	20	Nominal speed	rpm 720
Design stage	A	Altitude	m 541

Ethylene glycol in LT circuit % mass 0



Values in Graph

Engine suction air temperature °C	5.0	10.0	15.0	20.0	25.0	30.0	35.0
Generator Set Output, kW	6,995	6,995	6,995	6,995	6,995	6,995	6,995

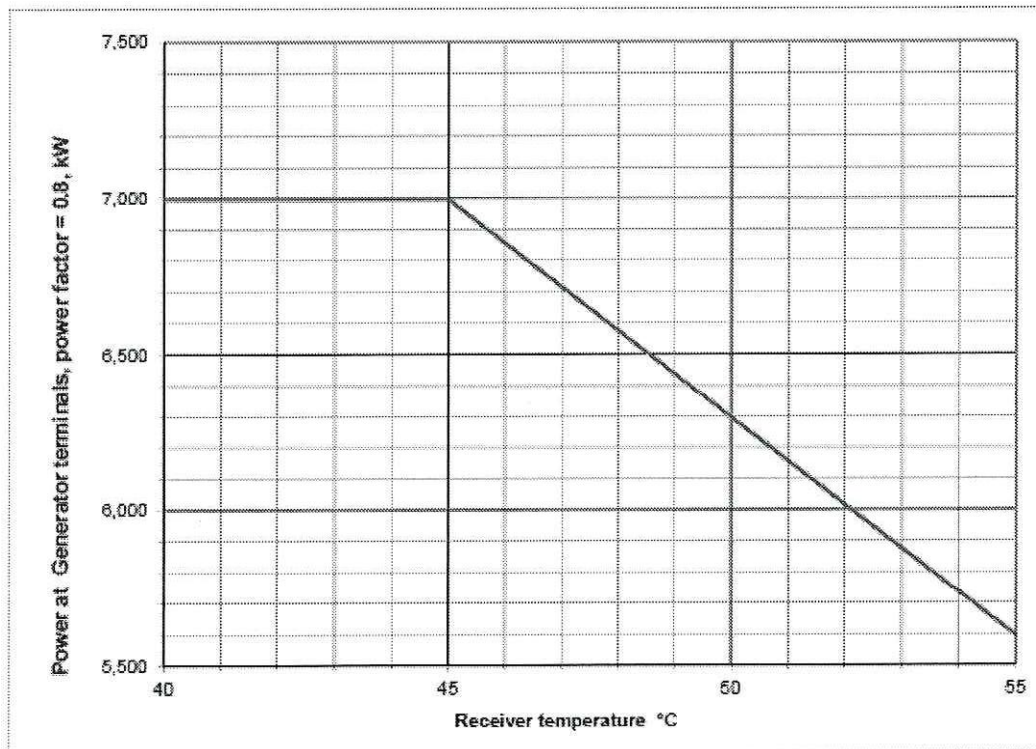
4.2.2 Adjustment of power for Receiver temperature

Adjustment of power for Receiver Temperature is calculated as per the curve below.

Gas engine power adjustment

Power limited by knocking

Manufacturer	WARTSILA	Engine compression ratio	10
Engine type	W 20V34LPG	ISO power	kW 7200
Number of cylinders	20	Nominal speed	rpm 720
Design stage	A	Altitude	m 541
Ethylene glycol in LT circuit %	mass 0		



Values in the graph

Receiver temperature °C	40.0	45.0	50.0	55.0
Generator Output, kW	6,995	6,995	6,296	5,596

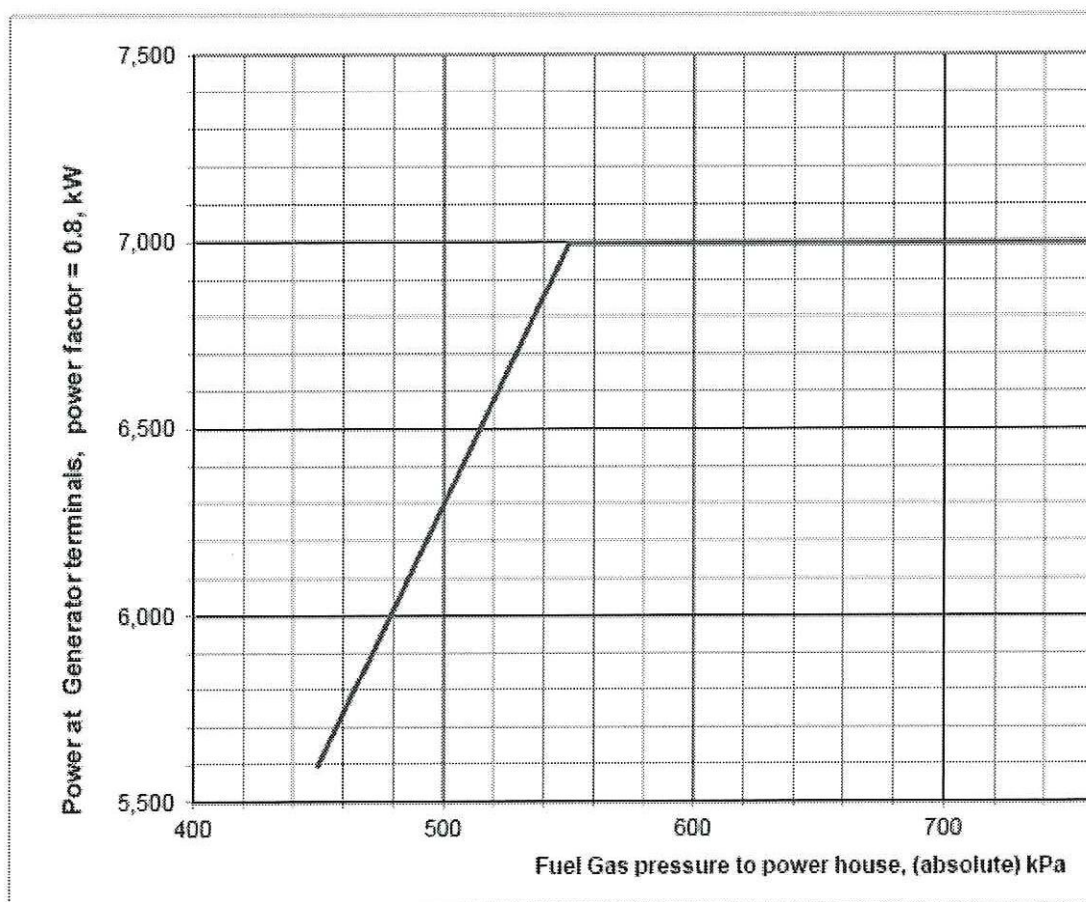
4.2.3 Adjustment of power for pressure of fuel gas

Adjustment of power for the Fuel Gas pressure at engine inlet and is calculated as per the curve below.

Gas engine power adjustment

Power limited by gas pressure

Manufacturer	WARTSILA	Engine compression ratio	10
Engine type	W 20V34LPG	ISO power	kW 7200
Number of cylinders	20	Nominal speed	rpm 720
Design stage	A	Altitude	m 541
Ethylene glycol in LT circuit %	mass 0		



Values in the Graph

Fuel Gas pressure to power house, (absolute) kPa	450	550	800
Generator Set Output, kW	5,596	6,995	6,995

(Draft) Test Procedures

The Produced Energy is measured using a PMU (Power Monitoring Measuring Unit) on the Respective Engine Control Panel, which measure Produce Energy at the Alternator terminals, The Power is calculated from the Produced Energy for each test period.

$$P = E_p / t_t$$

Where $E_p = E_g$

$$E_{mv} = E_g - E_o \text{ and } E_{hv} = E_{mv} - E_{su}$$

4.3 Adjustment of Electrical Power for under frequency

The frequency of the grid has an impact on the output from the engine-generator (EG) set. The frequency should stay within 1 % of the nominal frequency during the performance test.

Larger fluctuations in frequency can be accepted in exceptional cases but should not in any case exceed 2 % of the nominal frequency.

The output of the EG-set has to be adjusted if the frequency of the grid is > 1 % lower than the nominal frequency at the guaranteed point.

The correction is done according to following formula for each test period:

$$P_{adjusted} = (f_x / f_y) * P$$

Where f_x = nominal frequency 60 Hz.

4.4 Adjustment of Electrical Power for power factor

The power factor of the grid has an impact on the output from the EG-set.

Power factor during the performance test shall be equal to or above 0.8 (lagging) at generator terminals. No adjustment will be made for power factors higher than 0.8.

4.5 Measurement tolerances in electrical power test

The measurement tolerances will cause a measurement uncertainty in the measured electrical power. The components involved are the measuring transformers and the power measuring unit, and in some special cases only the energy measuring unit. The typical tolerances will be in the range of $\pm 0,3$ % to 1,0 %.

Tolerance usage is according to VDI-2048.

$$E_{tol} = 100 * \sqrt{(EMU_{tol} / 100)^2 + (I_{transf,tol} / 100)^2 + (U_{transf,tol} / 100)^2}$$

$$\Delta P = P_{average} * (E_{tol} / 100) \text{ , for definition of } P_{average} \text{ see 4.6.}$$