KENYA ELECTRICITY GENERATING COMPANY PLC

KGN-KIP-14-2023

RFx: 5000012126

TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS)UPGRADE FOR KIPEVU III POWER STATION

(OPEN INTERNATIONAL)

Kenya Electricity Generating Company PLC
Stima Plaza Phase III, Kolobot Road,
Parklands
P.O. BOX 47936-00100
NAIROBI.

Website: www.kengen.co.ke

February, 2023

TABLE OF CONTENTS

INVITATION TO TENDER

PROCURING ENTITY: KENYA ELECTRICITY GENERATING COMPANY PLC

CONTRACT NAME AND DESCRIPTION: **TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS) UPGRADE FOR KIPEVU III POWER STATION (KGN-KIP-14-2023)**

KenGen Plc invites sealed tenders from eligible candidates for the **Tender for Distributed Control Systems (DCS) Upgrade for Kipevu III Power Station** whose specifications are detailed in the Tender Document.

1. Tendering will be conducted under Open Competitive Method (**Open International)** using a standardized tender document.

2. Tendering is open to all qualified and interested Tenderers

3. Qualified and interested tenderers may obtain further information and inspect the Tender Documents during office hours between 8 a.m. and 5 p.m. starting at the date of advert at the office of:

   General Manager Supply Chain
   Tel: (254) (020) 3666000
   Email: tenders@kengen.co.ke; wkimote@kengen.co.ke; tnjau@kengen.co.ke; anthonyk@kengen.co.ke

4. The document can be viewed and downloaded for free from the website www.kengen.co.ke and/or on E-procurement https://eprocurement.kengen.co.ke:50001/irj/portal . Tenderers who download the tender document must forward their particulars immediately to (tenders@kengen.co.ke , 0711036000 and P.O.BOX 47936-00100 postal address) to facilitate any further clarification or addendum

5. Bidders who are unable to download the tender documents from the website may collect them from any KenGen Supply Chain Office upon payment of a non-refundable fee of **KShs.1,000.00** paid via Mpesa, pay bill no. **400200 and account no. 01120069076000**, then share the MPesa message to KenGen Finance office staff for receipt and issuance of official receipt or through a banker's cheque and payable to the address given below.

6. All Tenders must be accompanied by a "Tender security as part of the bid document. The Original Tender Security of **KES 1,500,000** or equivalent in a freely convertible currency, in form of an On-Demand Bank Guarantee, valid for 30 days beyond the tender validity period from any reputable banks registered by the Central Bank of Kenya. All tender securities submitted shall be subject to authentication by KenGen and **MUST** be submitted in a plain sealed envelope and clearly marked "**KGN-KIP-14-2023- TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS) UPGRADE FOR KIPEVU III POWER STATION**" and addressed to:

   General Manager, Supply Chain,
   Kenya Electricity Generating Company PLC,
   Ground Floor, Stima Plaza Phase III,
   Kolobot Road, Parklands,
   P.O. Box 47936, 00100
   NAIROBI.

The Original Tender Security clearly labeled should be dropped at the tender box located on Ground Floor at KenGen, RBS building.

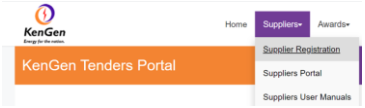
The Tenderer shall chronologically serialize all pages of the tender documents submitted.

There shall be a Mandatory Site Visit on *1st March, 2023 at 10.00 a.m* at Kipevu Power Station Starting at 10.00 a.m

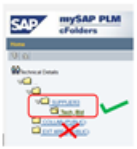
Completed tenders must be delivered to the address below on or before ***21st March, 2023 at 10.00 a.m.*** ***through*** *www.kengen.co.ke(https//e-procurement.kengen.co.ke]*. Electronic Tenders *[hard copies of the tender document **shall not** be permitted]*

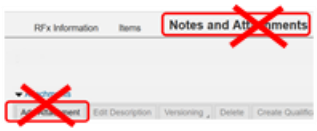
REGISTRATION AND BIDDING PROCESS

1. For suppliers registering for the first time using the link https://supplierregistration.kengen.co.ke:4302/slc_selfreg(bD1lbiZjPTMwMCZkPW1pbg==)/bspwdapplication.do#VIEW_ANCHOR-ROS_TOP ensure the **"Public Tender" checkbox is ticked** so that the login details are sent to suppliers automatically.

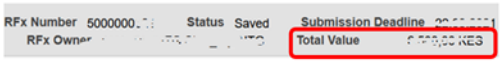


2. It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link https://eprocurement.kengen.co.ke:50001/irj/portal '***Technical RFx response'***. Responses documents attached to the '***notes and attachments***' tab **will not be considered for evaluation**.





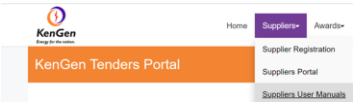
- Prices **MUST** be entered under item tab of the RFx and **MUST** be similar to the prices in the price/BoQ Schedule.



- Bidders should confirm on the supplier portal that the status of their RFx response shows "Submitted" and not "Saved" to ensure their RFx response is submitted.

- Bidders who have submitted their bids should not click on WITHDRAW but click on EDIT to amend their bid response with appropriate changes if they desire to do so.

- Manuals to guide on the bidding process are accessible via the KenGen Tenders Portal.



- Bidders to note that **system challenges/support** related to bid submission issues shall be **addressed to eprocurement@kengen.co.ke** tender closing date and time.

Tenders will be opened immediately after the deadline date and time specified above or any deadline date and time specified later. Tenders will be publicly opened in the presence of the Tenderers' designated representatives who choose to attend at the address below.

Kenya Electricity Generating Company PLC
Stima Plaza Phase III, Kolobot Road, Parklands
P.O. BOX 47936-00100

The addresses referred to above are:

A. **Address for obtaining further information and for purchasing tender documents**

Physical address for hand Courier Delivery to an office or Tender Box (City, Street Name, Building, Floor Number and Room)

Kenya Electricity Generating Company PLC
Stima Plaza Phase III, Kolobot Road, Parklands
P.O. BOX 47936-00100
Tenders@kengen.co.ke; cc
9th Floor

B. **Address for Opening of Tenders.**

General Manager, Supply Chain
Kenya Electricity Generating Company PLC
Stima Plaza Phase III, Kolobot Road, Parklands
P.O. BOX 47936-00100
6th Floor

KenGen adheres to high standards of integrity in its business operations.
Report any unethical behavior immediately to any of the provided anonymous hotline service.

1) Call Toll Free: 0800722626; 2) Free-Fax: 00800 007788;
3) Email: kengen@tip-offs.com 4) Website: www.tip-offs.com

GENERAL MANAGER, SUPPLY CHAIN

PART I - TENDERING PROCEDURES

SECTION I: INSTRUCTIONS TO TENDERERS

A General Provisions

1. Scope of Tender

1.1 The Procuring Entity as defined in the TDS invites tenders for supply of goods and, if applicable, any Related Services incidental thereto, as specified in Section V, Supply Requirements. The name, identification, and number of lots (contracts) of this Tender Document are specified in the TDS.

1.2 Throughout this tendering document:

a) the term "in writing" means communicated in written form (e.g. by mail, e-mail, fax, including if specified in the TDS, distributed or received through the electronic-procurement system used by the Procuring Entity) with proof of receipt;

b) if the context so requires, "singular" means "plural" and vice versa;

c) "Day" means calendar day, unless otherwise specified as "Business Day". A Business Day is any day that is an official working day of the Procuring Entity. It excludes official public holidays.

2. Fraud and Corruption

2.1 The Procuring Entity requires compliance with the provisions of the Public Procurement and Asset Disposal Act, 2015, Section 62 "Declaration not to engage in corruption". The tender submitted by a person shall include a declaration that the person shall not engage in any corrupt or fraudulent practice and a declaration that the person or his or her sub-contractors are not debarred from participating in public procurement proceedings.

2.2 The Procuring Entity requires compliance with the provisions of the Competition Act 2010, regarding collusive practices in contracting. Any tenderer found to have engaged in collusive conduct shall be disqualified and criminal and/or civil sanctions may be imposed. To this effect, Tenders shall be required to complete and sign the "Certificate of Independent Tender Determination" annexed to the Form of Tender.

2.3 Unfair Competitive Advantage - Fairness and transparency in the tender process require that the firms or their Affiliates competing for a specific assignment do not derive a competitive advantage from having provided consulting services related to this tender. To that end, the Procuring Entity shall indicate in the **Data Sheet** and make available to all the firms together with this tender document all information that would in that respect give such firm any unfair competitive advantage over competing firms.

3. Eligible Tenderers

3.1 A Tenderer may be a firm that is a private entity, an individual, a state-owned enterprise or institution subject to ITT3.7, or any combination of such entities in the form of a joint venture (JV) under an existing agreement or with the intent to enter into such an agreement supported by a letter of intent. Public employees and their close relatives *(spouses, children, brothers, sisters and uncles and aunts)* are not eligible to participate in the tender.

In the case of a joint venture, all members shall be jointly and severally liable for the execution of the entire Contract in accordance with the Contract terms. The JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the members of the JV during the Tendering process and, in the event the JV is awarded the Contract, during contract execution. The maximum number of JV members shall be specified in the **TDS.**

3.2 Public Officers of the Procuring Entity, their Spouses, Child, Parent, Brothers or Sister. Child, Parent, Brother or Sister of a Spouse their business associates or agents and firms/organizations in which they have a substantial or controlling interest shall not be eligible to tender or be awarded a contract. Public Officers are also not allowed to participate in any procurement proceedings.

3.3 A Tenderer shall not have a conflict of interest. Any Tenderer found to have a conflict of interest shall be disqualified. A Tenderer may be considered to have a conflict of interest for the purpose of this Tendering process, if the Tenderer:

a) directly or indirectly controls, is controlled by or is under common control with another Tenderer; or

b) receives or has received any direct or indirect subsidy from another Tenderer; or

c) has the same - representative or ownership as another Tenderer; or

d) has a relationship with another Tenderer, directly or through common third parties, that puts it in a position to influence the Tender of another Tenderer, or influence the decisions of the Procuring Entity regarding this Tendering process; or

e) or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the goods that are the subject of the Tender; or

f) or any of its affiliates has been hired (or is proposed to be hired) by the Procuring Entity or Procuring Entity for the Contract implementation; or

g) would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the TDS ITT 1.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or has a close business or family relationship with a professional staff of the Procuring Entity (or of the project implementing agency, who: (i) are directly or indirectly involved in the preparation of the tendering document or specifications of the Contract, and/or the Tender evaluation process of such Contract; or (ii) would be involved in the implementation or supervision of such Contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to the Procuring Entity throughout the Tendering process and execution of the Contract.

3.4 A tenderer shall not be involved in corrupt, coercive, obstructive, collusive or fraudulent practice. A tenderer that is proven to have been involved in any of these practices shall be automatically disqualified.

3.5 A firm that is a Tenderer (either individually or as a JV member) shall not submit more than one Tender, except for permitted alternative Tenders. This includes participation as a subcontractor. Such participation shall result in the disqualification of all Tenders in which the firm is involved. A firm that is not a Tenderer or a JV member, may participate as a subcontractor in more than one Tender. Members of a joint venture may not also make an individual tender, be a subcontractor in a separate tender or be part of another joint venture for the purposes of the same Tender.

3.6 A Tenderer may have the nationality of any country, subject to the restrictions pursuant to ITT3.9. A Tenderer shall be deemed to have the nationality of a country if the Tenderer is constituted, incorporated or registered in and operates in conformity with the provisions of the laws of that country, as evidenced by its articles of incorporation (or equivalent documents of constitution or association) and its registration documents, as the case may be. This criterion also shall apply to the determination of the nationality of proposed subcontractors or sub consultants for any part of the Contract including related Services.

3.7 A Tenderer that has been debarred by the PPRA from participating in public procurement shall be ineligible to tender or be awarded a contract. The list of debarred firms and individuals is available from the PPRA's website www.ppra.go.ke

3.8 Tenderers that are state-owned enterprises or institutions may be eligible to compete and be awarded a Contract(s) only if they are (i) a legal public entity of the state Government and/or public administration, (ii) financially autonomous and not receiving any significant subsidies or budget support from any public entity or Government, and (iii) operating under commercial law and vested with legal rights and liabilities similar to any commercial enterprise to enable it compete with firms in the private sector on an equal basis. Public employees and their close relatives are not eligible to participate in the tender.

3.9 Tenderers may be ineligible if their countries of origin (a) as a matter of law or official regulations, Kenya prohibits commercial relations with that country, or(b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods or contracting for supply of goods or services from that country, or any payments to any country, person, or entity in that country. A tenderer shall provide such documentary evidence of eligibility satisfactory to the Procuring Entity, as the Procuring Entity shall reasonably request.

3.10 Tenderers shall provide the qualification information statement that the tenderer (including all members of a joint venture and subcontractors) is not associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by the Procuring entity to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods under this Invitation for tenders.

3.11 Where the law requires tenderers to be registered with certain authorities in Kenya, such registration requirements shall be defined in the **TDS**

3.12 The Competition Act of Kenya requires that firms wishing to tender as Joint Venture undertakings which may prevent, distort or lessen competition in provision of services are prohibited unless they are exempt in accordance with the provisions of Section 25 of the Competition Act, 2010. JVs will be required to seek for exemption from the Competition Authority. Exemption shall not be a condition for tender, but it shall be a condition of contract award and signature. A JV tenderer shall be given opportunity to seek such exemption as a condition of award and signature of contract. Application for exemption from the Competition Authority of Kenya may be accessed from the website www.cak.go.ke.

3.13 A Kenyan tenderer shall provide evidence of having fulfilled his/her tax obligations by producing a current tax clearance certificate or tax exemption certificate issued by the Kenya Revenue Authority.

4. Eligible Goods and Related Services

4.1 All the Goods and Related Services to be supplied under the Contract shall have their origin in any country that is eligible in accordance with ITT 3.9.

4.2 For purposes of this ITT, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "related services" include services such as insurance, installation, training, and initial maintenance.

4.3 The term "origin" means the country where the goods have been mined, grown, cultivated, produced, manufactured or processed; or, through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.

4.4 A procuring entity shall ensure that the items listed below shall be sourced from Kenya and there shall be no substitutions from foreign sources. The affected items are:

a) motor vehicles, plant and equipment which are assembled in Kenya;
b) furniture, textile, foodstuffs, oil and gas, information communication technology, steel, cement, leather, agro-processed products, sanitary products, and other goods made in Kenya; or
c) goods manufactured, mined, extracted or grown in Kenya.

4.5 Any goods, works and production processes with characteristics that have been declared by the relevant national environmental protection agency or by other competent authority as harmful to human beings and to the environment shall not be eligible for procurement.

5. Sections of Tendering Document

5.1 The tendering document consist of Parts 1, 2, and 3, which include all the sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITT8.

PART : Tendering Procedures

i) Section I - Instructions to Tenderers (ITT)
ii) Section II - Tendering Data Sheet (TDS)
iii) Section III - Evaluation and Qualification Criteria
iv) Section IV - Tendering Forms

PART 2: Supply Requirements

v) Section V - Schedule of Requirements

PART 3 Contract

vi) Section VI - General Conditions of Contract (GCC)

vii) Section VII - Special Conditions of Contract (SCC)

viii) Section VIII- Contract Forms

5.2 The notice of Invitation to Tender or the notice to the prequalified Tenderers issued by the Procuring Entity is not part of the tendering document.

5.3 Unless obtained directly from the Procuring Entity, the Procuring Entity is not responsible for the completeness of the document, responses to requests for clarification, the minutes of the pre-tender meeting (if any), or addenda to the tendering document in accordance with ITT7.

5.4 The Tenderer is expected to examine all instructions, forms, terms, and specifications in the tendering document and to furnish with its Tender all information or documentation as is required by the tendering document.

6. Clarification of Tendering Document

6.1 A Tenderer requiring any clarification of the Tender Document shall contact the Procuring Entity in writing at the Procuring Entity's address specified in the **TDS** or raise its enquiries during the pre-Tender meeting if provided for in accordance with ITT 6.4. The Procuring Entity will respond in writing to any request for clarification, provided that such request is received no later than the period specified in the **TDS** prior to the deadline for submission of tenders. The Procuring Entity shall forward copies of its response to all tenderers who have acquired the Tender documents in accordance with ITT 5.3, including a description of the inquiry but without identifying its source. If so specified in the **TDS,** the Procuring Entity shall also promptly publish its response at the web page identified in the **TDS.** Should the clarification result in changes to the essential elements of the Tender Documents, the Procuring Entity shall amend the Tender Documents following the procedure under ITT 7.

6.2 The Procuring Entity shall specify in the **TDS** if a pre-tender conference will be held, when and where. The Tenderer's designated representative is invited to attend a pre-Tender meeting. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

6.3 The Tenderer is requested to submit any questions in writing, to reach the Procuring Entity not later than the period specified in the **TDS** before the meeting.

6.4 Minutes of the pre-Tender meeting, if applicable, including the text of the questions asked by Tenderers and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Tenderers who have acquired the Tender Documents in accordance with ITT 6.3. Minutes shall not identify the source of the questions asked.

6.5 The Procuring Entity shall also promptly publish anonymized (*no names*)Minutes of the pre-Tender meeting at the web page identified **in the TDS**. Any modification to the Tender Documents that may become necessary as a result of the pre-Tender meeting shall be made by the Procuring Entity exclusively through the issue of an Addendum pursuant to ITT 7 and not through the minutes of the pre-Tender meeting. Nonattendance at the pre- Tender meeting will not be a cause for disqualification of a Tenderer.

7. Amendment of Tendering Document

7.1 At any time prior to the deadline for submission of Tenders, the Procuring Entity may amend the tendering document by issuing addenda.

7.2 Any addendum issued shall be part of the tendering document and shall be communicated in writing to all who have obtained the tender document from the Procuring Entity in accordance with ITT 6.3. The Procuring Entity shall also promptly publish the addendum on the Procuring Entity's web page in accordance with ITT 7.1.

7.3 To give prospective Tenderers reasonable time in which to take an addendum into account

in preparing their Tenders, the Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders, pursuant to ITT 21.2.

C. Preparation of Tenders

8. Cost of Tendering

8.1 The Tenderer shall bear all costs associated with the preparation and submission of its Tender, and the Procuring Entity shall not be responsible or liable for those costs, regardless of the conduct or outcome of the Tendering process.

9. Language of Tender

9.1 The Tender, as well as all correspondence and documents relating to the Tender exchanged by the Tenderer and the Procuring Entity, shall be written in English Language**.** Supporting documents and printed literature that are part of the Tender may be in another language provided they are accompanied by an accurate translation of the relevant passages into the English Language**,** in which case, for purposes of interpretation of the Tender, such translation shall govern.

10. Documents Comprising the Tender

10.1 The Tender shall comprise the following:

a) Form of Tender prepared in accordance with ITT11;

b) Price Schedules: completed in accordance with ITT 11 and ITT 13;

c) Tender Security or Tender-Securing Declaration, in accordance with ITT 18.1;

d) Alternative Tender: if permissible, in accordance with ITT12;

e) Authorization: written confirmation authorizing the signatory of the Tender to commit the Tenderer, in accordance with ITT19.3;

f) Qualifications: documentary evidence in accordance with ITT 16.2 establishing the Tenderer qualifications to perform the Contract if its Tender is accepted;

g) Tenderer Eligibility: documentary evidence in accordance with ITT16.1 establishing the Tenderer eligibility to tender;

h) Eligibility of Goods and Related Services: documentary evidence in accordance with ITT 15, establishing the eligibility of the Goods and Related Services to be supplied by the Tenderer;

i) Conformity: documentary evidence in accordance with ITT15.2 that the Goods and Related Services conform to the tender document; and

j) any other document required in the TDS.

10.2 In addition to the requirements under ITT 10.1, Tenders submitted by a JV shall include a copy of the Joint Venture Agreement entered into by all members. Alternatively, a letter of intent to execute a Joint Venture Agreement in the event of a successful Tender shall be signed by all members and submitted with the Tender, together with a copy of the proposed Agreement.

10.3 The Tenderer shall furnish in the Form of Tender information on commissions gratuities, and fees, if any, paid or to be paid to agents or any other party relating to this Tender.

11. Form of Tender and Price Schedules

11.1 The Form of Tender and Price Schedules shall be prepared using the relevant forms furnished in Section IV, Tendering Forms. The forms must be completed without any alterations to the text. All blank spaces shall be filled in with the information requested. The Tenderer shall chronologically serialise pages of all tender documents submitted.

12. Alternative Tenders

12.1 Unless otherwise specified **in the TDS,** alternative Tenders shall not be considered.

13. Tender Prices and discounts

13.1 The prices quoted by the Tenderer in the Form of Tender and in the Price, Schedules shall conform to the requirements specified below.

13.2 All lots (contracts) and items must be listed and priced separately in the Price Schedules.

13.3 The price to be quoted in the Form of Tender in accordance with ITT10.1 shall be the total price of the Tender, including any discounts offered.

13.4 The Tenderer shall quote any discounts and indicate the methodology for their application in the form of tender. Conditional discounts will be rejected.

13.5 Prices quoted by the Tenderer shall be fixed during the performance of the Contract and not subject to variation on any account, unless otherwise specified **in the TDS.** A Tender submitted with an adjustable price quotation shall be treated as non-responsive and shall be rejected, pursuant to ITT 28. However, if in accordance with **the TDS**, prices quoted by the Tenderer shall be subject to adjustment during the performance of the Contract, a Tender submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero.

13.6 If specified in ITT 1.1, Tenders are being invited for individual lots (contracts) or for any combination of lots (packages). Unless otherwise specified **in the TDS,** prices quoted shall correspond to 100 % of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Tenderers wishing to offer discounts for the award of more than one Contract shall specify in their Tender the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Discounts shall be submitted in accordance with ITT 13.4 provided the Tenders for all lots (contracts) are opened at the same time.

13.7 The terms EXW, CIP, CIF, DDP and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce.

13.8 Prices shall be quoted as specified in each Price Schedule included in Section IV, Tendering Forms. The disaggregation of price components is required solely for the purpose of facilitating the comparison of Tenders by the Procuring Entity. This shall not in any way limit the Procuring Entity's right to contract on any of the terms offered. In quoting prices, the Tenderer shall be free to use transportation through carriers registered in any eligible country. Similarly, the Tenderer may obtain insurance services from any eligible country in accordance with ITT 3.6, Eligible Tenders. Prices shall be entered in the following manner:

a) For Goods manufactured in Kenya:

I) the price of the Goods quoted EXW (ex-works, ex-factory, ex warehouse, ex showroom, or off-the- shelf, as applicable) final destination point indicated in the **TDS**, including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of the Goods;

ii) any sales tax and other taxes which will be payable in Kenya on the Goods if the Contract is awarded to the Tenderer; and

iii) the price for inland transportation, insurance, and other local services required to convey the Goods to their final destination specified **in the TDS.**

b) For Goods manufactured outside Kenya, to be imported:

i) the price of the Goods, quoted CIP named place of destination, in Kenya, as specified **in the TDS;**

ii) the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination specified **in the TDS;**

c) For Goods manufactured outside Kenya, already imported:

i) the price of the Goods, including the original import value of the Goods; plus, any mark-up (or rebate); plus, any other related local cost, and custom duties and other import taxes already paid or to be paid on the Goods already imported;

ii) the custom duties and other import taxes already paid (need to be supported with

documentary evidence) or to be paid on the Goods already imported;

iii) any sales and other taxes levied in Kenya which will be payable on the Goods if the Contract is awarded to the Tenderer; and

iv) the price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination (Project Site) specified **in the TDS.**

d) for Related Services, other than inland transportation and other services required to convey the Goods to their final destination, whenever such Related Services are specified in the Schedule of Requirements, the price of each item comprising the Related Services (inclusive of any applicable taxes).

14. Currencies of Tender and Payment

14.1 The currency (ies) of the Tender, the currency (ies) of award and the currency (ies) of contract payments shall be the same**.**

14.2 The Tenderer shall quote in Kenya shillings. If allowed in the **TDS**, the Tenderer may express the Tender price in any currency, provided it shall use no more than two foreign currencies in addition to the Kenya Shilling.

14.3 The rates of exchange to be used by the Tenderer shall be based on the exchange rates provided by the Central Bank of Kenya on the date 30 days prior to the actual date of tender opening.

15. Documents Establishing the Eligibility and Conformity of the Goods and Related Services

15.1 To establish the eligibility of the Goods and Related Services in accordance with ITT 15, Tenderers shall complete the country of origin declarations in the Price Schedule Forms, included in Section IV, Tendering Forms.

15.2 To establish the conformity of the Goods and Related Services to the tendering document, the Tenderer shall furnish as part of its Tender the documentary evidence that the Goods conform to the technical specifications and standards specified in Section VII, Schedule of Requirements.

15.3 The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed item by item description of the essential technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods and Related Services to the technical specification, and if applicable, a statement of deviations and exceptions to the provisions of the Section VII, Schedule of Requirements.

15.4 The Tenderer shall also furnish a list giving full particulars, including available sources and current prices of spare parts, special tools, etc., necessary for the proper and continuing functioning of the Goods during the period **specified in the TDS** following commencement of the use of the goods by the Procuring Entity.

15.5 Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Procuring Entity in the Schedule of Requirements, are intended to be descriptive only and not restrictive. The Tenderer may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Procuring Entity's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in the Section VII, Schedule of Requirements.

16. Documents Establishing the Eligibility and Qualifications of the Tenderer

16.1 To establish Tenderer eligibility in accordance with ITT 4, Tenderers shall complete the Form of Tender, included in Section IV, Tendering Forms.

16.2 The documentary evidence of the Tenderer qualifications to perform the Contract if its Tender is accepted shall establish to the Procuring Entity's satisfaction:

a) that, if required **in the TDS**, a Tenderer that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section IV, Tendering Forms to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in Kenya;

b) that, if required **in the TDS**, in case of a Tenderer not doing business within the Kenya, the Tenderer is or will be (if awarded the Contract) represented by an Agent in the country equipped and able to carry out the Supplier's maintenance, repair and spare parts-stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications; and

c) that the Tenderer meets each of the qualification criterion specified in Section III, Evaluation and Qualification Criteria.

17. Period of Validity of Tenders

17.1 Tenders shall remain valid for the Tender Validity period specified **in the TDS**. The Tender Validity period starts from the date fixed for the Tender submission deadline (as prescribed by the Procuring Entity in accordance with ITT 21.1). A Tender valid for a shorter period shall be rejected by the Procuring Entity as non-responsive.

17.2 In exceptional circumstances, prior to the expiration of the Tender validity period, the Procuring Entity may request Tenderers to extend the period of validity of their Tenders. The request and the responses shall be made in writing. If a Tender Security is requested in accordance with ITT 18, it shall also be extended for a corresponding period. A Tenderer may refuse the request without forfeiting its Tender Security. A Tenderer granting the request shall not be required or permitted to modify its Tender, except as provided in ITT 17.3.

17.3 If the award is delayed by a period exceeding the number of days to be specified in the **TDS** days beyond the expiry of the initial tender validity period, the Contract price shall be determined as follows:

a) in the case of **fixed price** contracts, the Contract price shall be the tender price adjusted by the factor specified **in the TDS**;

b) in the case of **adjustable price** contracts, no adjustment shall be made; or in any case, tender evaluation shall be based on the tender price without taking into consideration the applicable correction from those indicated above.

18. Tender Security

18.1 The Tenderer shall furnish as part of its Tender, either a Tender-Securing Declaration or a Tender Security, as specified **in the TDS,** in original form and, in the case of a Tender Security**,** in the amount and currency specified **in the TDS.**

18.2 A Tender Securing Declaration shall use the form included in Section IV, Tendering Forms.

18.3 If a Tender Security is specified pursuant to ITT 18.1, the Tender Security shall be a demand guarantee in any of the following forms at the Tenderer option:

i) cash;
ii) a bank guarantee;
iii) a guarantee by an insurance company registered and licensed by the Insurance Regulatory Authority listed by the Authority; or
iv) a letter of credit; or
v) guarantee by a deposit taking micro-finance institution, Sacco society, the Youth Enterprise Development Fund or the Women Enterprise Fund.

18.4 If an unconditional guarantee is issued by a non-Bank financial institution located outside Kenya, the issuing non-Bank financial institution shall have a correspondent financial institution located in Kenya to make it enforceable unless the Procuring Entity has agreed in writing, prior to Tender submission, that a correspondent financial institution is not required. In the case of a bank guarantee, the Tender Security shall be submitted either using the Tender Security Form included in Section IV, Tendering Forms, or in another substantially similar format approved by the Procuring Entity prior to Tender submission. The Tender Security shall be valid for thirty
(30) days beyond the original validity period of the Tender, or beyond any period of extension if requested under ITT 17.2.

18.5 If a Tender Security is specified pursuant to ITT 18.1, any Tender not accompanied by a substantially responsive Tender Security shall be rejected by the Procuring Entity as non-responsive.

18.6 If a Tender Security is specified pursuant to ITT 18.1, the Tender Security of unsuccessful Tenderers shall be returned as promptly as possible upon the successful Tenderer signing the Contract and furnishing the Performance Security pursuant to ITT 46.The Procuring Entity shall also promptly return the tender security to the tenderers where the procurement proceedings are terminated, all tenders were determined non-responsive or a bidder declines to extend tender validity period.

18.7 The Tender Security of the successful Tenderer shall be returned as promptly as possible once the successful Tenderer has signed the Contract and furnished the required Performance Security.

18.8 The Tender Security may be forfeited or the Tender Securing Declaration executed:
a) if a Tenderer withdraws its Tender during the period of Tender validity specified by the Tenderer in the Form of Tender, or any extension thereto provided by the Tenderer; or
b) if the successful Tenderer fails to:
i) sign the Contract in accordance with ITT 45; or
ii) furnish a Performance Security in accordance with ITT 46.

18.9 Where tender securing declaration is executed, the Procuring Entity shall recommend to the PPRA that PPRA debars the Tenderer from participating in public procurement as provided in the law.

18.10 The Tender Security or Tender- Securing Declaration of a JV must be in the name of the JV that submits the Tender. If the JV has not been legally constituted into a legally enforceable JV at the time of Tendering, the Tender Security or Tender-Securing Declaration shall be in the names of all future members as named in the letter of intent referred to in ITT3.1 and ITT 10.2.

18.11 A tenderer shall not issue a tender security to guarantee itself.

19. Format and Signing of Tender

19.1 The Tenderer shall prepare one original of the documents comprising the Tender as described in ITT 11 and clearly mark it "ORIGINAL." Alternative Tenders, if permitted in accordance with ITT 12, shall be clearly marked "ALTERNATIVE." In addition, the Tenderer shall submit copies of the Tender, in the number **specified in the TDS** and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

19.2 Tenderers shall mark as "CONFIDENTIAL" information in their Tenders which is confidential to their business. This may include proprietary information, trade secrets, or commercial or financially sensitive information.

19.3 The original and all copies of the Tender shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Tenderer. This authorization shall consist of a written confirmation **as specified in the TDS** and shall be attached to the Tender. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Tender where entries or amendments have been made shall be signed or initialled by the person signing the Tender.

19.4 In case the Tenderer is a JV, the Tender shall be signed by an authorized representative of the JV on behalf of the JV, and so as to be legally binding on all the members as evidenced by a power of attorney signed by each members' legally authorized representatives.

19.5 Any inter-lineation, erasures, or overwriting shall be valid only if they are signed or initialled by the person signing the Tender.

D. Submission and Opening of Tenders

20 Sealing and Marking of Tenders

20.1 Depending on the sizes or quantities or weight of the tender documents, a tenderer may use an envelope, package or container. The Tenderer shall deliver the Tender in a single sealed envelope, or in a single sealed package, or in a single sealed container bearing the name and Reference number of the Tender, addressed to the Procuring Entity and a warning not to open before the time and date for Tender opening date. Within the single envelope, package or container, the Tenderer shall place the following separate, sealed envelopes:
a) in an envelope or package or container marked "ORIGINAL", all documents comprising the Tender, as described in ITT 11; and
b) in an envelope or package or container marked "COPIES", all required copies of the Tender; and
c) if alternative Tenders are permitted in accordance with ITT 12, and if relevant:
i) in an envelope or package or container marked "ORIGINAL –ALTERNATIVE TENDER", the alternative Tender; and
ii) in the envelope or package or container marked "COPIES- ALTERNATIVE TENDER", all required copies of the alternative Tender.

20.2 The inner envelopes or packages or containers shall:

a) bear the name and address of the Procuring Entity.
b) bear the name and address of the Tenderer; and
c) bear the name and Reference number of the Tender.

20.3 Where a tender package or container cannot fit in the tender box, the procuring entity shall:
a) Specify in the **TDS** where such documents should be received.
b) maintain a record of tenders received and issue acknowledgement receipt note to each tenderer specifying time and date of receipt.
c) Ensure all tenders received are handed over to the tender opening committee for opening at the specified opening place and time.

20.4 If an envelope or package or container is not sealed and marked as required, the *Procuring Entity* will assume no responsibility for the misplacement or premature opening of the Tender. Tenders misplaced or opened prematurely will not be accepted.

21. Deadline for Submission of Tenders

21.1 Tenders must be received by the Procuring Entity at the address and no later than the date and time specified **in the TDS.** When so specified **in the TDS**, Tenderers shall have the option of submitting their Tenders electronically. Tenderers submitting Tenders electronically shall follow the electronic Tender submission procedures **specified in the TDS**.

21.2 The Procuring Entity may, at its discretion, extend the deadline for the submission of Tenders by amending the tendering document in accordance with ITT7, in which case all rights and obligations of the Procuring Entity and Tenderers previously subject to the deadline shall thereafter be subject to the deadline as extended.

22. Late Tenders

22.1 The Procuring Entity shall not consider any Tender that arrives after the deadline for submission of Tenders. Any Tender received by the Procuring Entity after the deadline for submission of Tenders shall be declared late, rejected, and returned unopened to the Tenderer.

23. Withdrawal, Substitution, and Modification of Tenders

23.1 A Tenderer may withdraw, substitute, or modify its Tender after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization (the power of attorney) in accordance with ITT19.3, (except that withdrawal notices do not require copies). The corresponding substitution or modification of the Tender must accompany the respective written notice. All notices must be:
a) prepared and submitted in accordance with ITT 20 and 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," or "MODIFICATION;" and
b) received by the Procuring Entity prior to the deadline prescribed for submission of Tenders, in accordance with ITT 22.

23.3 Tenders requested to be withdrawn in accordance with ITT 23.1 shall be returned unopened to the Tenderers.

23.4 No Tender may be withdrawn, substituted, or modified in the interval between the deadline for submission of Tenders and the expiration of the period of Tender validity specified by the Tenderer on the Form of Tender or any extension thereof.

24. Tender Opening

24.1 Except as in the cases specified in ITT 23, the Procuring Entity shall, at the Tender opening, publicly open and read out all Tenders received by the deadline at the date, time and place specified **in the TDS** in the presence of Tenderers' designated representatives who choose to attend, including to attend any specific electronic tender opening procedures if electronic tendering is permitted in accordance with ITT 21.1, shall be as specified **in the TDS.**

24.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding Tender shall not be opened, but returned to the Tenderer. If the withdrawal envelope does not contain a copy of the "power of attorney" confirming the signature as a person duly authorized to sign on behalf of the Tenderer, the corresponding Tender will be opened. No Tender withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at Tender opening.

24.3 Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding Tender being substituted, and the substituted Tender shall not be opened, but returned to the Tenderer. No Tender substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at Tender opening.

24.4 Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding Tender. No Tender modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at Tender opening.

24.5 Next, all remaining envelopes shall be opened one at a time, reading out: the name of the Tenderer and whether there is a modification; the total Tender Prices, per lot (contract) if applicable, including any discounts and alternative Tenders; the presence or absence of a Tender Security, if required; and any other details as the Procuring Entity may consider appropriate.

24.6 Only Tenders, alternative Tenders and discounts that are opened and read out at Tender opening shall be considered further for evaluation. The Form of Tender and pages of the Bills of Quantities are to be initialed by the members of the tender opening committee attending the opening. The number of representatives of the Procuring Entity to sign shall be specified in the **TDS.**

24.7 The Procuring Entity shall neither discuss the merits of any Tender nor reject any Tender (except for late Tenders, in accordance with ITT 22.1).

24.8 The Procuring Entity shall prepare a record of the Tender opening that shall include, as a minimum:

a) the name of the Tenderer and whether there is a withdrawal, substitution, or modification;
b) the Tender Price, per lot (contract) if applicable, including any discounts;
c) any alternative Tenders;
d) the presence or absence of a Tender Security or Tender-Securing Declaration, if one was required;
e) number of pages of each tender document submitted.

24.9 The Tenderers' representatives who are present shall be requested to sign the record. The omission of a Tenderer signature on the record shall not invalidate the contents and effect of the record. A copy of the tender opening register shall be issued to a Tenderer upon request.

E. Evaluation and Comparison of Tenders

25. Confidentiality

25.1 Information relating to the evaluation of Tenders and recommendation of contract award, shall not be disclosed to Tenderers or any other persons not officially concerned with the tendering process until the information on Intention to Award the Contract is transmitted to all Tenderers in accordance with ITT 41.

25.2 Any effort by a Tenderer to influence the Procuring Entity in the evaluation or contract award decisions may result in the rejection of its Tender.

25.3 Notwithstanding ITT 25.2, from the time of Tender opening to the time of Contract Award, if any Tenderer wishes to contact the Procuring Entity on any matter related to the Tendering process, it should do so in writing.

26. Clarification of Tenders

26.1 To assist in the examination, evaluation, comparison of the Tenders, and qualification of the Tenderers, the Procuring Entity may, at its discretion, ask any Tenderer for a clarification of its Tender. Any clarification submitted by a Tenderer in respect to its Tender and that is not in response to a request by the Procuring Entity shall not be considered. The Procuring Entity's request for clarification and the response shall be in writing. No change, including any voluntary increase or decrease, in the prices or substance of the Tender shall be sought, offered, or permitted except to confirm the correction of arithmetic errors discovered by the Procuring Entity in the Evaluation of the Tenders, in accordance with ITT 30.

If a Tenderer does not provide clarifications of its Tender by the date and time set in the Procuring Entity's request for clarification, its Tender may be rejected.

27. Deviations, Reservations, and Omissions

27.1 During the evaluation of Tenders, the following definitions apply:

a) "Deviation" is a departure from he requirements specified in the Tendering document;

b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the tendering document; and

c) "Omission" is the failure to submit part or all of the information or documentation required in the tendering document.

28. Determination of Responsiveness

28.1 The Procuring Entity's determination of a Tender's responsiveness is to be based on the contents of the Tender itself, as defined in ITT28.2.

28. A substantially responsive Tender is one that meets the requirements of the tendering document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:

a) if accepted, would:

i) affect in any substantial way the scope, quality, or performance of the Goods and Related Services specified in the Contract; or

ii) limit in any substantial way, inconsistent with the tendering document, the Procuring Entity's rights or the Tenderer obligations under the Contract; or

b) if rectified, would unfairly affect the competitive position of other Tenderers presenting substantially responsive Tenders.

28.2 The Procuring Entity shall examine the technical aspects of the Tender submitted in accordance with ITT 15 and ITT 16, in particular, to confirm that all requirements of Section VII, Schedule of Requirements have been met without any material deviation or reservation, or omission.

28.3 If a Tender is not substantially responsive to the requirements of tendering document, it shall be rejected by the Procuring Entity and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.

29. Non-conformities, Errors and Omissions

29.1 Provided that a Tender is substantially responsive, the Procuring Entity may waive any non-conformities in the Tender.

29.2 Provided that a Tender is substantially responsive, the Procuring Entity may request that the Tenderer submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial non- conformities or omissions in the Tender related to documentation requirements. Such omission shall not be related to any aspect of the price of the Tender. Failure of the Tenderer to comply with the request may result in the rejection of its Tender.

30. Provided that a Tender is substantially responsive, the Procuring Entity shall rectify quantifiable nonmaterial non-conformities related to the Tender Price. To this effect, the Tender Price shall

be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component in the manner specified **in the TDS**. The adjustment shall be based on the ***average*** price of the item or component as quoted in other substantially responsive Tenders. If the price of the item or component cannot be derived from the price of other substantially responsive Tenders, the Procuring Entity shall use its best estimate

31. Arithmetical Errors

31.1 The tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity.

31.2 Provided that the Tender is substantially responsive, the Procuring Entity shall handle errors on the following basis:

a) Any error detected if considered a major deviation that affects the substance of the tender, shall lead to disqualification of the tender as non-responsive .

b) Any errors in the submitted tender arising from a miscalculation of unit price, quantity, subtotal and total bid price shall be considered as a major deviation that affects the substance of the tender and shall lead to disqualification of the tender as non-responsive. and

c) if there is a discrepancy between words and figures, the amount in words shall prevail.

30.2 Tenderers shall be notified of any error detected in their bid during the notification of a ward.

32. Conversion to Single Currency

32.1 For evaluation and comparison purposes, the currency(ies) of the Tender shall be converted in a single currency as specified **in the TDS.**

33. Margin of Preference and Reservations

33.1 A margin of preference may be allowed on locally manufactured goods only when the contract is open to international tendering, where the tender is likely to attract foreign goods and where the contract exceeds the threshold specified in the Regulations.

33.2 For purposes of granting a margin of preference on locally manufactured goods under international competitive tendering, a procuring entity shall not subject the items listed below to international tender and hence no margin of preference shall be allowed. The affected items are:

a) motor vehicles, plant and equipment which are assembled in Kenya;

b) furniture, textile, foodstuffs, oil and gas, information communication technology, steel, cement, leather agro-processing, sanitary products, and other goods made in Kenya; or

c) goods manufactured, mined, extracted or grown in Kenya.

33.3 A margin of preference shall not be allowed unless it is specified so in the **TDS**.

33.4 Contracts procured on basis of international competitive tendering shall not be subject to reservations to specific groups s as provided in ITT 32.5.

33.5 Where it is intended to reserve a contract to a specific group of businesses (these groups are Small and Medium Enterprises, Women Enterprises, Youth Enterprises and Enterprises of persons living with disability, as the case may be), and who are appropriately registered as such by the authority to be specified in the **TDS**, a procuring entity shall ensure that the invitation to tender specifically indicates that only businesses or firms belonging to the specified group are eligible to tender as specified in the **TDS**. No tender shall be reserved to more than one group. If not so stated in the Tender documents, the invitation to tender will be open to all interested tenderers.

34. Evaluation of Tenders

34.1 The Procuring Entity shall use the criteria and methodologies listed in this ITT and Section III,

Evaluation and Qualification criteria. No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies, the Procuring Entity shall determine the Lowest Evaluated Tender. This is the Tender of the Tenderer that meets the qualification criteria and whose Tender has been determined to be:

a) substantially responsive to the tender documents; and

b) the lowest evaluated price.

34.2 Price evaluation will be done for Items or Lots (contracts), as specified **in the TDS;** and the Tender Price as quoted in accordance with ITT 14. To evaluate a Tender, the Procuring Entity shall consider the following:

a) price adjustment due to unconditional discounts offered in accordance with ITT 13.4;
b) converting the amount resulting from applying (a) and (b) above, if relevant, to a single currency in accordance with ITT 31;
c) price adjustment due to quantifiable nonmaterial non-conformities in accordance with ITT 29.3; and
d) any additional evaluation factors specified **in the TDS** and Section III, Evaluation and Qualification Criteria.

34.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be considered in Tender evaluation.

34.4 Where the tender involves multiple lots or contracts, the tenderer will be allowed to tender for one or more lots (contracts). Each lot or contract will be evaluated in accordance with ITT 33.2. The methodology to determine the lowest evaluated tenderer or tenderers based one lot (contract) or based on a combination of lots (contracts), will be specified in Section III, Evaluation and Qualification Criteria. In the case of multiple lots or contracts, tenderer will be will be required to prepare the Eligibility and Qualification Criteria Form for each Lot.

34.5 The Procuring Entity's evaluation of a Tender will include and consider:

a) in the case of Goods manufactured in Kenya, sales and other similar taxes, which will be payable on the goods if a contract is awarded to the Tenderer;
b) in the case of Goods manufactured outside Kenya, already imported or to be imported, customs duties and other import taxes levied on the imported Good, sales and other similar taxes, which will be payable on the Goods if the contract is awarded to the Tenderer;

34.6 The Procuring Entity's evaluation of a Tender may require the consideration of other factors, in addition to the Tender Price quoted in accordance with ITT 14. These factors may be related to the characteristics, performance, and terms and conditions of purchase of the Goods and Related Services. The effect of the factors selected, if any, shall be expressed in monetary terms to facilitate comparison of Tenders, unless otherwise specified in the **TDS** from amongst those set out in Section III, Evaluation and Qualification Criteria. The additional criteria and methodologies to be used shall be as specified in ITT 33.2(d).

35. Comparison of Tenders

35.1 The Procuring Entity shall compare the evaluated costs of all substantially responsive Tenders established in accordance with ITT 33.2 to determine the Tender that has the lowest evaluated cost. The comparison shall be on the basis of total cost (place of final destination) prices for all goods and all prices, plus cost of inland transportation and insurance to place of destination, for goods manufactured within the Kenya, together with prices for any required installation, training, commissioning and other services.

36. Abnormally Low Tenders

36.1 An Abnormally Low Tender is one where the Tender price, in combination with other constituent elements of the Tender, appears unreasonably low to the extent that the Tender price raises material concerns with the Procuring Entity as to the capability of the Tenderer to perform the Contract for the offered Tender price.

36.2 In the event of identification of a potentially Abnormally Low Tender by the evaluation committee, the Procuring Entity shall seek written clarification from the Tenderer, including a detailed price analyses of its Tender price in relation to the subject matter of the contract, scope, delivery schedule, allocation of risks and responsibilities and any other requirements of

the tendering document.

36.3 After evaluation of the price analysis, in the event that the Procuring Entity determines that the Tenderer has failed to demonstrate its capability to perform the contract for the offered Tender price, the Procuring Entity shall reject the Tender.

37. Abnormally High Tenders

36.4 An abnormally high price is one where the tender price, in combination with other constituent elements of the Tender, appears unreasonably too high to the extent that the Procuring Entity is concerned that it (the Procuring Entity) may not be getting value for money or it may be paying too high a price for the contract compared with market prices or that genuine competition between Tenderers is compromised.

36.5 In case of an abnormally high tender price, the Procuring Entity shall make a survey of the market prices, check if the estimated cost of the contract is correct and review the Tender Documents to check if the specifications, scope of work and conditions of contract are contributory to the abnormally high tenders. The Procuring Entity may also seek written clarification from the tenderer on the reason for the high tender price. The Procuring Entity shall proceed as follows:

i) If the tender price is abnormally high based on wrong estimated cost of the contract, the Procuring Entity may accept or not accept the tender depending on the Procuring Entity's budget considerations.

ii) If specifications, scope of work and/or conditions of contract are contributory to the abnormally high tender prices, the Procuring Entity shall reject all tenders and may retender for the contract based on revised estimates, specifications, scope of work and conditions of contract, as the case may be.

36.6 If the Procuring Entity determines that the Tender Price is abnormally too high because genuine competition between tenderers is compromised (*often due to collusion, corruption or other manipulations*), the Procuring Entity shall reject all Tenders and shall institute or cause relevant Government Agencies to institute an investigation on the cause of the compromise, before retendering.

38. Post Qualification of the Tenderer

38.1 The Procuring Entity shall determine, to its satisfaction, whether the eligible Tenderer that is selected as having submitted the lowest evaluated cost and substantially responsive Tender, meets the qualifying criteria specified in Section III, Evaluation and Qualification Criteria.

38.2 The determination shall be based upon an examination of the documentary evidence of the Tenderer qualifications submitted by the Tenderer, pursuant to ITT 15 and 16. The determination shall not take into consideration the qualifications of other firms such as the Tenderer subsidiaries, parent entities, affiliates, subcontractors (other than specialized subcontractors if permitted in the tendering document), or any other firm(s) different from the Tenderer.

38.3 An affirmative determination shall be a prerequisite for award of the Contract to the Tenderer. A negative determination shall result in disqualification of the Tender, in which event the Procuring Entity shall proceed to the Tenderer who offers a substantially responsive Tender with the next lowest evaluated cost to make a similar determination of that Tenderer qualifications to perform satisfactorily.

39. Lowest Evaluated Tender

39.1 Having compared the evaluated prices of Tenders, the Procuring Entity shall determine the Lowest Evaluated Tender. The Lowest Evaluated Tender is the Tender of the Tenderer that meets the Qualification Criteria and whose Tender has been determined to be:

a) Most responsive to the Tender document; and

b) the lowest evaluated price.

40. Procuring Entity's Right to Accept Any Tender, and to Reject Any orAll Tenders.

40.1 The Procuring Entity reserves the right to accept or reject any Tender, and to annul the Tendering process and reject all Tenders at any time prior to notification Award, without thereby incurring any liability to Tenderers. In case of annulment, all Tenderers shall be notified with reasons andall Tenders submitted and specifically, tender securities, shall be promptly returned to the Tenderers.

F. Award of Contract

41. Award Criteria

The Procuring Entity shall award the Contract to the successful tenderer whose tender has been determined to be the Lowest Evaluated Tender in accordance with procedures in Section 3: Evaluation and Qualification Criteria.

42. Notice of Intention to enter into a Contract

Upon award of the contract and Prior to the expiry of the Tender Validity Period the Procuring Entity shall issue a Notification of Intention to Enter into a Contract / Notification of award to all tenderers which shall contain, at a minimum, the following information:

a) the name and address of the Tenderer submitting the successful tender;

b) the Contract price of the successful tender;

c) a statement of the reason(s) the tender of the unsuccessful tenderer to whom the letter is addressed was unsuccessful, unless the price information in (c) above already reveals the reason;

d) the expiry date of the Standstill Period; and

e) instructions on how to request a debriefing and/or submit a complaint during the standstill period;

43. Standstill Period

43.1 The Contract shall not be awarded earlier than the expiry of a Standstill Period of 14 days to allow any dissatisfied candidate to launch a complaint. Where only one Tender is submitted, the Standstill Period shall not apply.

43.2 Where standstill period applies, it shall commence when the Procuring Entity has transmitted to each Tenderer the Notification of Intention to Enter into a Contract to the successful Tenderer.

44. Debriefing by the Procuring Entity

44.1 On receipt of the Procuring Entity's Notification of Intention to Enter into a Contract referred to in ITT 41, an unsuccessful tenderer may make a written request to the Procuring Entity for a debriefing on specific issues or concerns regarding their tender. The Procuring Entity shall provide the debriefing within five days of receipt of the request.

44.2 Debriefings of unsuccessful Tenderers may be done in writing or verbally. The Tenderer shall bear its own costs of attending such a debriefing meeting.

45. Letter of Award

Prior to the expiry of the Tender Validity Period and upon expiry of the Standstill Period specified in ITT 42, upon addressing a complaint that has been filed within the Standstill Period, the Procuring Entity shall transmit the Letter of Award to the successful Tenderer. The letter of award shall request the successful tenderer to furnish the Performance Security within 21days of the date of the letter.

46. Signing of Contract

46.1 Upon the expiry of the fourteen days of the Notification of Intention to enter into contract and upon the parties meeting their respective statutory requirements, the Procuring Entity shall send the successful Tenderer the Contract Agreement.

46.2 Within fourteen (14) days of receipt of the Contract Agreement, the successful Tenderer shall sign, date, and return it to the Procuring Entity.

46.3 The written contract shall be entered into within the period specified in the notification of award and before expiry of the tender validity period.

47. Performance Security

47.1 Within twenty-one (21) days of the receipt of Letter of Acceptance from the Procuring Entity, the successful Tenderer, if required, shall furnish the Performance Security in accordance with the GCC 18, using for that purpose the Performance Security Form included in Section X, Contract Forms. If the Performance Security furnished by the successful Tenderer is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Tenderer to be acceptable to the Procuring Entity. A foreign institution providing a bond shall have a correspondent financial institution located in Kenya, unless the Procuring Entity has agreed in writing that a correspondent financial institution is not required.

47.2 Failure of the successful Tenderer to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Tender Security. In that event the Procuring Entity may award the Contract to the Tenderer offering the next lowest Evaluated Tender.

47.3 Performance security shall not be required for a contract, if so specified in the **TDS**.

48. Publication of Procurement Contract

Within fourteen days after signing the contract, the Procuring Entity shall publish and publicize the awarded contract at its notice boards, entity website; and on the Website of the Authority in manner and format prescribed by the Authority. At the minimum, the notice shall contain the following information:

a) name and address of the Procuring Entity;

b) name and reference number of the contract being awarded, a summary of its scope and the selection method used;

c) the name of the successful Tenderer, the final total contract price, the contract duration.

d) dates of signature, commencement and completion of contract;

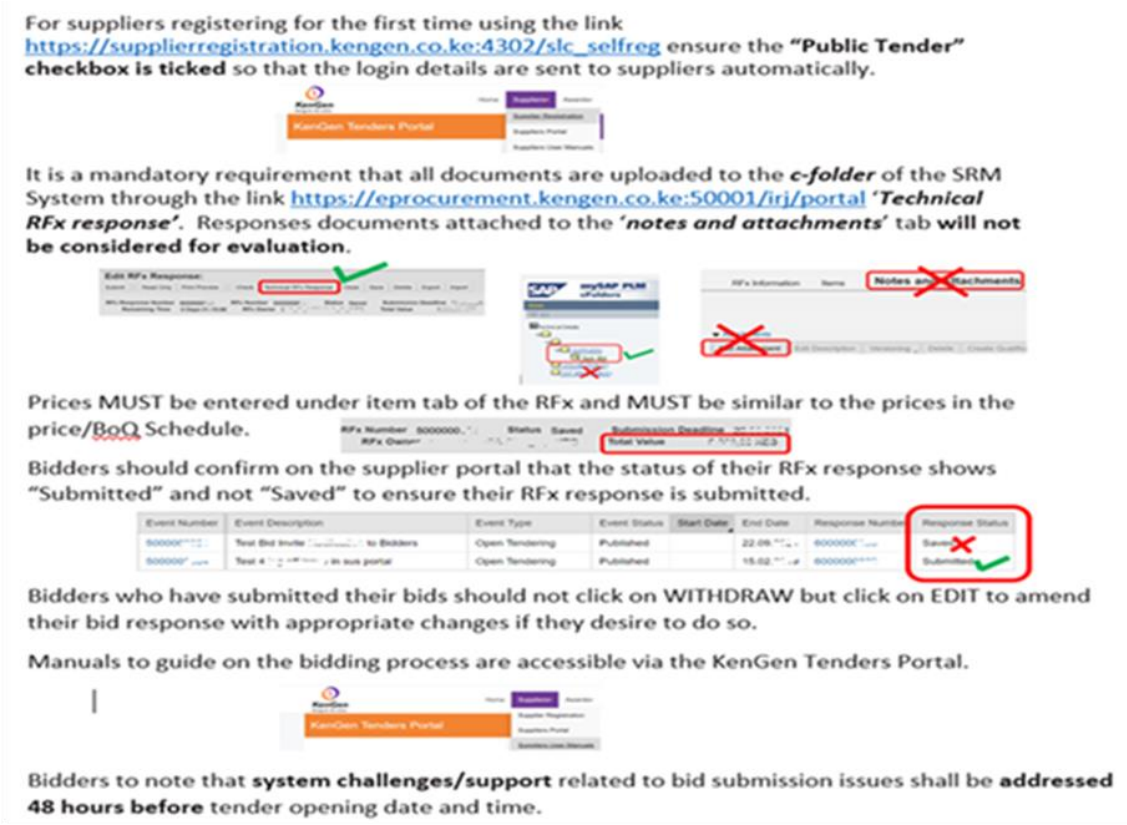
e) names of all Tenderers that submitted Tenders, and their Tender prices as read out at Tender opening;

49. Procurement Related Complaint

The procedures for making a Procurement-related Complaint are as specified in the **TDS.**

SECTION II – TENDER DATA SHEET (TDS)

The following specific data shall complement, supplement, or amend the provisions in the Instructions to Tenderers (ITT). Whenever there is a conflict, the provisions herein shall prevail over those in ITT.

ITT Reference	A. General
ITT 1.1	The reference number of the Invitation for Tenders is: ***[KGN-KIP-14-2023]*** The Procuring Entity is: ***Kenya Electricity Generating Company Plc.*** The name of the Contract is: ***TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS) UPGRADE FOR KIPEVU III POWER STATION***
ITT 1.2(a)	**Electronic –Procurement System** The tender MUST be submitted through our e-procurement platform found at www.kengen.co.ke (https://eprocurement.kengen.co.ke:50001/irj/portal **SUBMISSION OF TENDERS:** ***The tender MUST be submitted through our e-procurement platform found at www.kengen.co.ke (https://eprocurement.kengen.co.ke:50001/irj/portal*** ***SUBMISSION OF TENDERS:***  For suppliers registering for the first time using the link https://supplierregistration.kengen.co.ke:4302/slc_selfreg ensure the **"Public Tender" checkbox is ticked** so that the login details are sent to suppliers automatically. It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link https://eprocurement.kengen.co.ke:50001/irj/portal '***Technical RFx response'***. Responses documents attached to the '***notes and attachments***' tab **will not be considered for evaluation.** Prices MUST be entered under item tab of the RFx and MUST be similar to the prices in the price/BoQ Schedule. Bidders should confirm on the supplier portal that the status of their RFx response shows "Submitted" and not "Saved" to ensure their RFx response is submitted. Bidders who have submitted their bids should not click on WITHDRAW but click on EDIT to amend their bid response with appropriate changes if they desire to do so. Manuals to guide on the bidding process are accessible via the KenGen Tenders Portal. Bidders to note that **system challenges/support** related to bid submission issues shall be **addressed 48 hours before** tender opening date and time. **Tender closing date: *21st March, 2023 at 10.00 a.m*** **Tender opening date: *21st March, 2023 at 10.30 a.m***
ITT 3	Eligibility This tender is open to **OPEN INTERNATIONAL**
ITT 13.8	Tender Prices Prices indicated in the tender form shall be inclusive of all applicable taxes and insurance
ITT 10.1 (g)	Tender eligibility and qualifications Proof of eligibility, qualification documents of evidence (see evaluation criteria)
ITT 3.5	***Joint venture shall not be required in this tender.***

ITT 3.7	A list of debarred firms and individuals is available on the PPRA's website: www.ppra.go.ke
ITT 3.11	Tenderers shall be required to be to be registered with *https://supplierregistration.kengen.co.ke:4302/slc_selfreg(bD1lbiZjPTMwMCZkPW1pbg==)/bspwdapplication.do#VIEW_ANCHOR-ROS_TOP* and ensure the "Public Tender" checkbox is ticked so that the login details are sent to suppliers automatically. This is for suppliers registering for the first time to enable bidding via e-procurement portal
	B. Contents of Tendering Document
ITT 6	For Clarification of Tender purposes only, the Procuring Entity's address is: Attention: *General Manager Supply Chain ,* *Kenya Electricity Generating Company PLC,* ***9th Floor, KenGen Pension Plaza II,*** *Kolobot Road, Parklands,* *P.O. Box 47936, 00100* *NAIROBI.* *tenders@kengen.co.ke; cc wkimote@kengen.co.ke; tnjau@kengen.co.ke; anthonyk@kengen.co.ke* Requests for clarification should be received by the Procuring Entity no later than: *7 days before tender closing date.* Web page: *[www.kengen.co.ke].*
ITT 8.1	**There shall be a Mandatory Site Visit on 21st February 2023 at Kipevu Power Station Starting at 10.00 a.m.**
	C. Preparation of Tenders
ITT 12.1	Alternative Tenders ***"shall not be"*** considered
ITT 13.5	The prices quoted by the Tenderer shall not be subject to adjustment during the performance of the Contract.
ITT 13.8 (a) (i)	Place of final destination: ***Kipevu III Store***
ITT 14.2	Foreign currency requirements: **Freely convertible Foreign currency is Allowed.** Where foreign currencies are used, KenGen will convert these currencies to Kenya Shillings using the selling exchange rate provided by the Central Bank of Kenya on the date of tender closing before comparing all the responsive tenders.
ITT 16.2 (a)	Manufacturer's authorization is: ***"required"***
ITT 17.1	The Tender validity period shall be **126 days.**
ITT 18.1	All Tenders must be accompanied by a "Tender security" as part of the bid document. The Original Tender Security of **KES 1,500,000** or equivalent in a freely convertible currency, in form of an On-Demand Bank Guarantee, valid for 30 days beyond the tender validity period from any reputable banks registered by the Central Bank of Kenya. All tender securities submitted shall be subject to authentication by KenGen and **MUST** be submitted in a plain sealed envelope and clearly marked "**KGN-KIP-14-2023- TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS) UPGRADE FOR KIPEVU III POWER STATION**" and addressed to: General Manager, Supply Chain, Kenya Electricity Generating Company PLC, Ground Floor, Stima Plaza Phase III, Kolobot Road, Parklands,

	P.O. Box 47936, 00100 NAIROBI. The Original Tender Security clearly labeled should be dropped at the tender box located on Ground Floor at KenGen, RBS building.
ITT 19.1	***Tender submission*** • Online submission • *The tender MUST be submitted through our e-procurement platform found at www.kengen.co.ke (https://eprocurement.kengen.co.ke:50001/irj/portal* • For suppliers registering for the first time ensure the "Public Procurement" checkbox is ticked so that the login details are sent to suppliers automatically. • It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link '***Technical RFx response'***. No responses/documents shall be attached to the '***notes and attachments***' tab • ***SUBMISSION OF TENDERS:*** For suppliers registering for the first time using the link https://supplierregistration.kengen.co.ke:4302/slc_selfreg ensure the **"Public Tender" checkbox is ticked** so that the login details are sent to suppliers automatically.  It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link https://eprocurement.kengen.co.ke:50001/irj/portal '***Technical RFx response'***. Responses documents attached to the '***notes and attachments***' tab **will not be considered for evaluation.**  Prices MUST be entered under item tab of the RFx and MUST be similar to the prices in the price/BoQ Schedule.  Bidders should confirm on the supplier portal that the status of their RFx response shows "Submitted" and not "Saved" to ensure their RFx response is submitted.  Bidders who have submitted their bids should not click on WITHDRAW but click on EDIT to amend their bid response with appropriate changes if they desire to do so. Manuals to guide on the bidding process are accessible via the KenGen Tenders Portal.  Bidders to note that **system challenges/support** related to bid submission issues shall be **addressed 48 hours before** tender opening date and time. .
ITT 19.3	The written confirmation of authorization to sign on behalf of the Tenderer shall consist of**: a *Power of Attorney***
ITT 20.4	**The deadline for Tender submission is:** Date and time: ***[21st March, 2023 at 10.00 a.m]*** For online submission Tender documents Must be submitted through our e-procurement platform found at www.kengen.co.ke (https://eprocurement.kengen.co.ke:50001/irj/portal For suppliers registering for the first time ensure the "Public Procurement" checkbox is ticked so that the login details are sent to suppliers automatically. It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link '***Technical RFx response'***. No responses/documents shall be attached to the '***notes and attachments***' tab.

	D. Submission and Opening of Tenders
ITT 24.1	The Tender opening shall take place at: **Kenya Electricity Generating Company PLC,** **Ground Floor, KenGen Pension Plaza I,** **Kolobot Road, Parklands,** **P.O. Box 47936, 00100** **NAIROBI.** 1. Date and time: ***[21st March, 2023 at 10.30 a.m]*** Note; In an effort to curb the spread of the COVID-19 pandemic the following measures shall apply: •Where bidders or their representatives choose to attend the bid opening, KenGen shall limit the persons to a maximum of 5 people, whom shall be nominated by the bidders present for the opening session. •The tender opening shall be conducted in a spacious environment and observing a social distance of at least 1.5 meters away from each other. Screening and registration of all attendees shall take place in all sessions. •Failure to attend the bid opening shall not invalidate the process. Bidders can request for the tender opening minutes of the tender opening session through the following email address tenders@kengen.co.ke
E. Evaluation and Comparison of Tenders	
ITT 31.1	Where other currencies are used, the procuring entity will convert these currencies to Kenya Shillings using the selling exchange rate on the date of tender closing provided by the Central Bank of Kenya before comparing all the responsive tenders.
ITT 33.3	A margin of preference and/or reservation ***shall not apply.***
ITT 31.2	Preliminary Examination Tender sum as submitted and read out during tender opening is absolute and shall not be subject to correction, adjustment or amendment on any way Sec.82 of PPADA 2015, Subject to section 79(2)(b) of the Act,
	Due Diligence KenGen may at its own discretion conduct due diligence on the eligible bidders to establish their ability to perform the contract before award of the contract.
F. Award of Contract	
ITT 46.3	Performance security shall be at **10% of the Contract Price where the contract value is above five million shillings**
ITT 49.1	The procedures for making a Procurement-related Complaint are detailed in the "Notice of Intention to Award the Contract" herein and are also available from the PPRA Website www.ppra.go.ke .
ITT 51	The place of arbitration shall be Nairobi, Kenya. (Nairobi Centre for International Arbitration)

SECTION III - EVALUATION AND QUALIFICATION CRITERIA

1. General Provisions

1.1 Wherever a Tenderer is required to state a monetary amount, Tenderers should indicate the Kenya Shilling equivalent using the rate of exchange determined as follows:

a) For business turnover or financial data required for each year - Exchange rate prevailing on the last day of the respective calendar year (in which the amounts for that year is to be converted) was originally established.

b) Value of single contract - Exchange rate prevailing on the date of the contract signature.

c) Exchange rates shall be taken from the publicly available source identified in **the ITT 14.3.** Any error in determining the exchange rates in the Tender may be corrected by the Procuring Entity.

1.2 This section contains the criteria that the Procuring Entity Procuring Entity shall use to evaluate tender and qualify tenderers. No other factors, methods or criteria shall be used other than those specified in this tender document. The Tenderer shall provide all the information requested in the forms included in Section IV, Tendering Forms. The Procuring Entity should use the Standard Tender Evaluation Report for Goods and Works for evaluating Tenders.

2. Evaluation of Tenders (ITT 33)

2.1 Successful Tender or Tenders

The Procuring Entity shall use the criteria and methodologies listed in this Section to evaluate Tenders. By applying these criteria and methodologies, the Procuring Entity shall determine the successful Tender or Tenders which has/have been determined to:

a) be substantially responsive to the tender documents;

b) offer the lowest evaluated cost to the Procuring Entity for all items of Goods to be procured based on either a single Contract or all multiple Contracts combined, as the case may be, in accordance with the ITT 13.6 inviting Tender prices and discounts, and provisions made of the Tender Document for evaluation of tenders and award of contract (s); and

c) be offered by Tenderer or Tenderers that substantially meet the qualification criteria applicable for Contract or combined Contracts for which they are selected.

2.2 Evaluation of Tenders

Preliminary examination for Determination of Responsiveness

The Procuring Entity will start by examining all tenders to ensure they meet in all respects the eligibility criteria and other mandatory requirements in the ITT, and that the tender is complete in all aspects in meeting the requirements provided for in the preliminary evaluation criteria outlined below. The Standard Tender Evaluation Report Document for Goods and Works for evaluating Tenders provides very clear guide on how to deal with review of these requirements. Tenders that do not pass the Preliminary Examination will be considered non-responsive and will not be considered further.

No	Requirements
MR 1	Copy of Registration Certificate /Certificate of Incorporation
MR 2	Valid copy of business permit
MR 3	Valid tax compliance certificate /PIN Certificate
MR 4	Copy of CR 12 issued within 6 months before tender closure date (where applicable)/or Identity Card (**National ID**) if Sole Proprietor

MR 5	An Original Tender Security of **KES 1,500,000** or equivalent in a freely convertible currency, in form of an On-Demand Bank Guarantee, valid for 30 days beyond the tender validity period from any reputable banks registered by the Central Bank of Kenya. All tender securities submitted shall be subject to authentication by KenGen and **MUST** be submitted in a plain sealed envelope and clearly marked "**KGN-KIP-14-2023- TENDER FOR DISTRIBUTED CONTROL SYSTEMS (DCS) UPGRADE FOR KIPEVU III POWER STATION**"	
MR 6	Dully filled, signed and stamped Confidential Business Questionnaire	
MR 7	Dully filled, signed and stamped Form of Tender	
MR 8	Dully filled, signed and stamped Price Schedule	
MR 9	Dully filled, signed and stamped Addendum(s)/Clarification(s) issued must be attached (Where Applicable)	
MR 10	The Tender MUST be submitted in the required format and serialized on each page of the bid submitted, **Sec.74.1. i. of the PPADA, 2015.**	
MR 11	Tender documents Must be submitted through our e-procurement platform found at www.kengen.co.ke (https://eprocurement.kengen.co.ke:50001/irj/portal For suppliers registering for the first time ensure the "Public Procurement" checkbox is ticked so that the login details are sent to suppliers automatically. It is a mandatory requirement that all documents are uploaded to the ***c-folder*** of the SRM System through the link '***Technical RFx response'***. No responses/documents shall be attached to the '***notes and attachments***' tab as they will not be considered for evaluation	
MR 12	Dully filled, signed and stamped Certificate of Independent Tender Determination	
MR 13	Dully filled, signed and stamped Self Declaration form that the tenderer is not debarred in the matter of PPADA 2015v	
MR 14	Dully filled, signed and stamped Self Declaration form that the tenderer will not engage in any corrupt or Fraudulent Practice.	
MR 15	Dully filled, signed and stamped Declaration and Commitment to the Code of Ethics	
MR 16	The tender has been dully signed by the person lawfully authorized to do so through the power of Attorney	
MR 17	Dully filled, signed and stamped Tenderer Information Form	
MR 18	Annual Accounts The audited financial statements by a registered audit firm for the last 3 years shall be submitted and must demonstrate the current soundness of the Bidder's financial position and its prospective long-term profitability	
MR 19	Financial ratios	Current Ratio 1:1
		Debt to Equity Ratio of less than 2.33 times
		Positive net worth in their audited balance sheet
		At least one year out of the recent three years of positive Profit before Tax
MR 20	Provide proof of Authorization from PLC Hardware manufacturer by providing a Manufacturer's Authorization Letter (if bidder not an OEM) or Manufacturer's Self Declaration for Original Equipment Manufacturer bidders from Siemens or Schneider Electric.	
MR 21	Provide proof of Authorization from HMI Software manufacturer by providing a Manufacturer's Authorization Letter (if bidder not an OEM) or Manufacturer's Self Declaration for Original Equipment Manufacturer bidders	
MR 22	Stamped and Signed Twelve (12) months Warranty from Manufacturer	
MR 23	Attach signed Site Visit Certificate	

STAGE 2: TECHNICAL EVALUATION ON CAPACITY TO DELIVER THE CONTRACT

Technical evaluation shall be carried out only if the tender is determined to be responsive to the preliminary examination.
Bidder must demonstrate conformance to all the technical specifications and requirements as per section V of the tender document, and as tabulated below.

TECHNICAL EVALUATION CRITERIA

CRITERIA No.	DESCRIPTION
1.	Compliance to technical schedule -duly filled
2.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the server based HMI application
3.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the PLC
4.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the servers
5.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the operator workstation hardware
6.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the substation control gateway hardware.
7.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the panel mount industrial PC hardware(for local HMI)
8.	OEM Lifecycle Support Letters – A letter from OEM indicating that remaining life cycle of the PLC, HMI software, Server is more than ten (10) years.
9.	Successful completion of at-least two (2) PLC,DCS HMI and HV substation SCADA projects for large power generation plants in the last ten (10) years- Attach completion certificate.
10.	Detailed work schedule showing minimum effect on availability of plant - Attach work schedule.
11.	Compliance to technical requirements as detailed in the this tender document
12.	Training – Attach training content & schedule for factory and site training.
13.	FAT, testing and commissioning procedures.
14.	Contractor engineering team- Attach CVs of project manager and commissioning engineer.
15.	Warranty 24 months after successful commissioning of the DCS.
	TOTAL

STAGE 3. FINANCIAL EVALUATION

- Financial evaluation shall involve checking completeness of financial bids.
- Award shall be based on the lowest prices**.**

- Tender sum as submitted and read out during tender opening is absolute and final and shall not be subject to correction, adjustment or amendment.
- No correction of Arithmetic errors whatsoever

STAGE 4. DUE DILIGENCE

KenGen shall prior to award of the tender determine to its satisfaction whether the selected bids will qualify to perform the contract satisfactorily by carrying out a Due Diligence visit as required.

SECTION IV

TENDERING FORMS

Form of Tender Tenderer Information Form Tenderer JV Members Information Form

Price Schedule: Goods Manufactured Outside Kenya, to be Imported Price Schedule: Goods Manufactured Outside Kenya, already imported Price Schedule: Goods Manufactured in Kenya Price and Completion Schedule – Related Services Form of Tender Security – Demand Guarantee Form of Tender Security (Tender Bond)

Form of Tender-Securing Declaration Manufacturer's Authorization Form

FORM OF TENDER
(Amended and issued pursuant to PPRA CIRCULAR No. 02/2022)

INSTRUCTIONS TO TENDERERS

i) All italicized text is to help the Tenderer in preparing this form.

ii) The Tenderer must prepare this Form of Tender on stationery with its letterhead clearly showing the Tenderer's complete name and business address. Tenderers are reminded that this is a mandatory requirement.

iii) Tenderer must complete and sign CERTIFICATE OF INDEPENDENT TENDER DETERMINATION and the SELF DECLARATION FORMS OF THE TENDERER as listed under (s) below.

Date of this Tender submission:.....*[insert date (as day, month and year) of Tender submission]*

Tender Name and Identification:.....*[insert identification]*

Alternative No.:.....*[insert identification No if this is a Tender for an alternative]*

To: ..... *[Insert complete name of Procuring Entity]*

Dear Sirs,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct and complete the Works and remedy any defects therein for the sum of Kenya Shillings [*[Amount in figures]* _____Kenya Shillings *[amount in words]*_____.

The above amount includes foreign currency amount (s) of [*state figure or a percentage and currency*] [figures]_____[words]_____.

The percentage or amount quoted above does not include provisional sums, and only allows not more than two foreign currencies.

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Project Manager's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Special Conditions of Contract.

3. We agree to adhere by this tender until_____*[Insert date],* and it shall remain binding upon us and may be accepted at any time before that date.

4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us. We further understand that you are not bound to accept the lowest or any tender you may receive.

5. We, the undersigned, further declare that:
   i) *No reservations:* We have examined and have no reservations to the tender document, including Addenda issued in accordance with ITT 28;
   ii) *Eligibility:* We meet the eligibility requirements and have no conflict of interest in accordance with ITT 3 and 4;
   iii) *Tender-Securing Declaration:* We have not been suspended nor declared ineligible by the Procuring Entity based on execution of a Tender-Securing or Proposal-Securing Declaration in the Procuring Entity's Country in accordance with ITT 19.8;
   iv) Conformity: We offer to execute in conformity with the tendering documents and in accordance with the implementation and completion specified in the construction schedule, the following Works: *[insert a brief description of the Works];*

v) *Tender Price:* The total price of our Tender, excluding any discounts offered in item 1 above is: *[Insert one of the options below as appropriate]*

vi Option 1, in case of one lot: Total price is: [*insert the total price of the Tender in words and figures, indicating the various amounts and the respective currencies*]; Or

Option 2, in case of multiple lots:

a) Total price of each lot [*insert the total price of each lot in words and figures, indicating the various amounts and the respective currencies*]; and

b) Total price of all lots (sum of all lots) [*insert the total price of all lots in words and figures, indicating the various amounts and the respective currencies*];

vii) *Discounts:* The discounts offered and the methodology for their application are:

viii) The discounts offered are: [*Specify in detail each discount offered.*]

ix) The exact method of calculations to determine the net price after application of discounts is shown below: [*Specify in detail the method that shall be used to apply the discounts*];

x) *Tender Validity Period:* Our Tender shall be valid for the period specified in TDS 18.1 (as amended, if applicable) from the date fixed for the Tender submission deadline specified in TDS 22.1 (as amended, if applicable), and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

xi) *Performance Security:* If our Tender is accepted, we commit to obtain a Performance Security in accordance with the Tendering document;

xii) *One Tender Per Tender:* We are not submitting any other Tender(s) as an individual Tender, and we are not participating in any other Tender(s) as a Joint Venture member or as a subcontractor, and meet the requirements of ITT 3.4, other than alternative Tenders submitted in accordance with ITT 13.3;

xiii) *Suspension and Debarment:* We, along with any of our subcontractors, suppliers, Project Manager, manufacturers, or service providers for any part of the contract, are not subject to, and not controlled by any entity or individual that is subject to, a temporary suspension or a debarment imposed by the Public Procurement Regulatory Authority or any other entity of the Government of Kenya, or any international organization.

xiv) *State-owned enterprise or institution:* [*select the appropriate option and delete the other*] [*We are not a state-owned enterprise or institution*] / [*We are a state-owned enterprise or institution but meet the requirements of ITT 3.8*];

xv) *Commissions, gratuities, fees:* We have paid, or will pay the following commissions, gratuities, or fees with respect to the tender process or execution of the Contract: *[insert complete name of each Recipient, its full address, the reason for which each commission or gratuity was paid and the amount and currency of each such commission or gratuity].*

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate "none.")

xvi) Binding Contract: We understand that this Tender, together with your written acceptance thereof included in your Letter of Acceptance, shall constitute a binding contract between us, until a formal contract is prepared and executed;

xvii) Not Bound to Accept: We understand that you are not bound to accept the lowest evaluated cost Tender, the Most Advantageous Tender or any other Tender that you may receive;

xviii) Fraud and Corruption: We hereby certify that we have taken steps to ensure that no person acting for us or on our behalf engages in any type of Fraud and Corruption;

xix) Collusive practices: We hereby certify and confirm that the tender is genuine, non-collusive and made with the intention of accepting the contract if awarded. To this effect we have signed the "Certificate of Independent Tender Determination" attached below.

xx) We undertake to adhere by the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal, copy available from_____(*specify website*) during the procurement process and the execution of any resulting contract.

xxi) **Beneficial Ownership Information:** We commit to provide to the procuring entity the Beneficial Ownership Information in conformity with the Beneficial Ownership Disclosure Form upon receipt of notification of intention to enter into a contract in the event we are the successful tenderer in this subject procurement proceeding.

xxii) We, the Tenderer, have duly completed, signed and stamped the following Forms as part of our Tender:

a) Tenderer's Eligibility; Confidential Business Questionnaire – to establish we are not in any conflict to interest.
b) Certificate of Independent Tender Determination – to declare that we completed the tender without colluding with other tenderers.
c) Self-Declaration of the Tenderer – to declare that we will, if awarded a contract, not engage in any form of fraud and corruption.
d) Declaration and commitment to the Code of Ethics for Persons Participating in Public Procurement and Asset Disposal

Further, we confirm that we have read and understood the full content and scope of fraud and corruption as informed in **"Appendix 1- Fraud and Corruption**" attached to the Form of Tender.

Name of the Tenderer: *[*insert complete name of person signing the Tender*]

Name of the person duly authorized to sign the Tender on behalf of the Tenderer: **[*insert complete name of person duly authorized to sign the Tender*]

Title of the person signing the Tender: [*insert complete title of the person signing the Tender*]

Signature of the person named above: [*insert signature of person whose name and capacity are*

shown above] **Date signed** [*insert date of signing*] day of [*insert month*], [*insert year*]

Date signed_____day of_____, _____

Notes
** In the case of the Tender submitted by joint venture specify the name of the Joint Venture as Tenderer*
*** Person signing the Tender shall have the power of attorney given by the Tenderer to be attached with the Tender.*

CERTIFICATE OF INDEPENDENT TENDER DETERMINATION

I, the undersigned, in submitting the accompanying Letter of Tender to the_____ *[Name of Procuring Entity]* for:_____*[Name and number of tender]* in response to the request for tenders made by:_____*[Name of Tenderer]* do hereby make the following statements that I certify to be true and complete in every respect:
I certify, on behalf of_____*[Name of Tenderer]* that:

1. I have read and I understand the contents of this Certificate;

2. I understand that the Tender will be disqualified if this Certificate is found not to be true and complete in every respect;

3. I am the authorized representative of the Tenderer with authority to sign this Certificate, and to submit the Tender on behalf of the Tenderer;

4. For the purposes of this Certificate and the Tender, I understand that the word "competitor" shall include any individual or organization, other than the Tenderer, whether or not affiliated with the Tenderer, who:

a) has been requested to submit a Tender in response to this request for tenders;

b) could potentially submit a tender in response to this request for tenders, based on their qualifications, abilities or experience;

5. The Tenderer discloses that [check one of the following, as applicable]:

a) The Tenderer has arrived at the Tender independently from, and without consultation, communication, agreement or arrangement with, any competitor;

b) the Tenderer has entered into consultations, communications, agreements or arrangements with one or more competitors regarding this request for tenders, and the Tenderer discloses, in the attached document(s), complete details thereof, including the names of the competitors and the nature of, and reasons for, such consultations, communications, agreements or arrangements;

6. In particular, without limiting the generality of paragraphs (5)(a) or (5)(b) above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:

a) prices;

b) methods, factors or formulas used to calculate prices;

c) the intention or decision to submit, or not to submit, a tender; or

d) the submission of a tender which does not meet the specifications of the request for Tenders; except as specifically disclosed pursuant to paragraph (5)(b) above;

7. In addition, there has been no consultation, communication, agreement or arrangement with any competitor regarding the quality, quantity, specifications or delivery particulars of the works or services to which this request for tenders relates, except as specifically authorized by the procuring authority or as specifically disclosed pursuant to paragraph (5)(b) above;

8. the terms of the Tender have not been, and will not be, knowingly disclosed by the Tenderer, directly or indirectly, to any competitor, prior to the date and time of the official tender opening, or of the awarding of the Contract, whichever comes first, unless otherwise required by law or as specifically disclosed pursuant to paragraph (5)(b) above.

Name_____

Title_____

Date_____

[Name, title and signature of authorized agent of Tenderer and Date]

SELF-DECLARATION FORMS

FORM SD1

SELF DECLARATION THAT THE PERSON/TENDERER IS NOT DEBARRED IN THE MATTER OF THE PUBLIC PROCUREMENT AND ASSET DISPOSAL ACT 2015.

I,.....of Post Office Box.....being a resident of .....in the Republic of.....do hereby make a statement as follows:-

1. THAT I am the Company Secretary/ Chief Executive/Managing Director/Principal Officer/Director of .....*(insert name of the Company)* who is a Bidder in respect of **Tender No.** .....for.....*(insert tender title/description)* for.....*(insert name of the Procuring entity)* and duly authorized and competent to make this statement.

2. THAT the aforesaid Bidder, its Directors and subcontractors have not been cak
3. red from participating in procurement proceeding under Part IV of the Act.

4. THAT what is deponed to herein above is true to the best of my knowledge, information and belief.

……	……..…	.....
….	.	……
(Title)	(Signature)	(Date)

Bidder Official Stamp

FORM SD2

SELF DECLARATION THAT THE PERSON/TENDERER WILL NOT ENGAGE IN ANY CORRUPT OR FRAUDULENT PRACTICE

I,.....of P. O. Box.....being a resident of .....in the Republic of .....do hereby make a statement as follows:-

1. THAT I am the Chief Executive/Managing Director/Principal Officer/Director of..... ….....……...…… *(insert name of the Company)* who is a Bidder in respect of **Tender No**.....for.....*(insert tender title/description)* for.....*(insert name of the Procuring entity)* and duly authorized and competent to make this statement.

2. THAT the aforesaid Bidder, its servants and/or agents /subcontractors will not engage in any corrupt or fraudulent practice and has not been requested to pay any inducement to any member of the Board, Management, Staff and/or employees and/or agents of ……..*(insert name of the Procuring entity)* which is the procuring entity.

3. THAT the aforesaid Bidder, its servants and/or agents /subcontractors have not offered any inducement to any member of the Board, Management, Staff and/or employees and/or agents of ……..*(name of the procuring entity).*

4. THAT the aforesaid Bidder will not engage/has not engaged in any corrosive practice with other bidders participating in the subject tender.

5. THAT what is deponed to herein above is true to the best of my knowledge information and belief.

…… ……...…
.....…… (Title)
(Signature) (Date)

Bidder's Official Stamp

DECLARATION AND COMMITMENT TO THE CODE OF ETHICS

I.....(person) on behalf of ***(Name of the Business/ Company/Firm***).....declare that I have read and fully understood the contents of the Public Procurement & Asset Disposal Act, 2015, Regulations and the Code of Ethics for persons participating in Public Procurement and Asset Disposal and my responsibilities under the Code.

I do hereby commit to abide by the provisions of the Code of Ethics for persons participating in Public Procurement and Asset Disposal.

Name of Authorized signatory.....

Sign…….....

Position.....

Office address…….

Telephone…….....…….

E-

mail…….....……

……

Name of the Firm/Company…….....……

Date…….....……

(Company Seal/ Rubber Stamp where applicable)

Witness

Name

…….....……

….

Sign…….....……

Date…….....……

APPENDIX I- FRAUD AND CORRUPTION

(Appendix I shall not be modified)

1. Purpose

1.1 The Government of Kenya's Anti-Corruption and Economic Crime laws and their sanction's policies and procedures, Public Procurement and Asset Disposal Act *(no. 33 of 2015)* and its Regulation, and any other Kenya's Acts or Regulations related to Fraud and Corruption, and similar offences, shall apply with respect to Public Procurement Processes and Contracts that are governed by the laws of Kenya.

2. Requirements

2.1 The Government of Kenya requires that all parties including Procuring Entities, Tenderers, (applicants/proposers), Consultants, Contractors and Suppliers; any Sub-contractors, Sub-consultants, Service providers or Suppliers; any Agents (whether declared or not); and any of their Personnel, involved and engaged in procurement under Kenya's Laws and Regulation, observe the highest standard of ethics during the procurement process, selection and contract execution of all contracts, and refrain from Fraud and Corruption and fully comply with Kenya's laws and Regulations as per paragraphs 1.1 above.

2.2 Kenya's public procurement and asset disposal act *(no. 33 of 2015)* under Section 66 describes rules to be followed and actions to be taken in dealing with Corrupt, Coercive, Obstructive, Collusive or Fraudulent practices, and Conflicts of Interest in procurement including consequences for offences committed. A few of the provisions noted below highlight Kenya's policy of no tolerance for such practices and behavior:

1) a person to whom this Act applies shall not be involved in any corrupt, coercive, obstructive, collusive or fraudulent practice; or conflicts of interest in any procurement or asset disposal proceeding;

2) A person referred to under subsection (1) who contravenes the provisions of that sub-section commits an offence;

3) Without limiting the generality of the subsection (1) and (2), the person shall be—

a) disqualified from entering into a contract for a procurement or asset disposal proceeding; or

b) if a contract has already been entered into with the person, the contract shall be voidable;

4) The voiding of a contract by the procuring entity under subsection (7) does not limit any legal remedy the procuring entity may have;

5) An employee or agent of the procuring entity or a member of the Board or committee of the procuring entity who has a conflict of interest with respect to a procurement:-

a) shall not take part in the procurement proceedings;

b) shall not, after a procurement contract has been entered into, take part in any decision relating to the procurement or contract; and

c) shall not be a subcontractor for the bidder to whom was awarded contract, or a member of the group of bidders to whom the contract was awarded, but the subcontractor appointed shall meet all the requirements of this Act.

6) An employee, agent or member described in subsection (1) who refrains from doing anything prohibited under that subsection, but for that subsection, would have been within his or her duties shall disclose the conflict of interest to the procuring entity;

7) If a person contravenes subsection (1) with respect to a conflict of interest described in subsection (5)(a) and the contract is awarded to the person or his relative or to another person in whom one of them had a direct or indirect pecuniary interest, the contract shall be terminated and all costs incurred by the public entity shall be made good by the awarding officer. Etc.

2.3 In compliance with Kenya's laws, regulations and policies mentioned above, the Procuring Entity:

a) Defines broadly, for the purposes of the above provisions, the terms set forth below as follows:

i) "corrupt practice" is the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;

ii) "fraudulent practice" is any act or omission, including misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain financial or other benefit or to avoid an obligation;

iii) "collusive practice" is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;

iv) "coercive practice" is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

v) "obstructive practice" is:

- deliberately destroying, falsifying, altering, or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede investigation by Public Procurement Regulatory Authority (PPRA) or any other appropriate authority appointed by Government of Kenya into allegations of a corrupt, fraudulent, coercive, or collusive practice; and/or threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or

- acts intended to materially impede the exercise of the PPRA's or the appointed authority's inspection and audit rights provided for under paragraph 2.3 e. below.

b) Defines more specifically, in accordance with the above procurement Act provisions set forth for fraudulent and collusive practices as follows:

"fraudulent practice" includes a misrepresentation of fact in order to influence a procurement or disposal process or the exercise of a contract to the detriment of the procuring entity or the tenderer or the contractor, and includes collusive practices amongst tenderers prior to or after tender submission designed to establish tender prices at artificial non-competitive levels and to deprive the procuring entity of the benefits of free and open competition.

c) Rejects a proposal for award[1] of a contract if PPRA determines that the firm or individual recommended for award, any of its personnel, or its agents, or its sub-consultants, sub-contractors, service providers, suppliers and/ or their employees, has, directly or indirectly, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for the contract in question;

d) Pursuant to the Kenya's above stated Acts and Regulations, may sanction or debar or recommend to appropriate authority (ies) for sanctioning and debarment of a firm or individual, as applicable under the Acts and Regulations;

e) Requires that a clause be included in Tender documents and Request for Proposal documents requiring (i) Tenderers (applicants/proposers), Consultants, Contractors, and Suppliers, and their Sub-contractors, Sub-consultants, Service providers, Suppliers, Agents personnel, permit the PPRA or any other appropriate authority appointed by Government of Kenya to inspect[2] all accounts, records and other documents relating to the procurement process, selection and/or contract execution, and to have them audited by auditors appointed by the PPRA or any other appropriate authority appointed by Government of Kenya; and

f) Pursuant to Section 62 of the above Act, requires Applicants/Tenderers to submit along with their Applications/Tenders/Proposals a "Self-Declaration Form" as included in the procurement document declaring that they and all parties involved in the procurement process and contract execution have not engaged/will not engage in any corrupt or fraudulent practices.

TENDERER INFORMATION FORM

[The tenderer shall fill in this Form in accordance with the instructions indicated below. No alterations to its format shall be permitted and no substitutions shall be accepted.]

Date: ..... *[insert date (as day, month and year) of Tender submission]*

Tender Name and Identification:.....[*insert identification*

Alternative No.:..... *[insert identification No if this is a Tender for*

an alternative] Page_____of_____pages

1.Tenderer'sName*[insert Tenderer's legal name]*
2.In case of JV, legal name of each member:*[insert legal name of each member in JV]*
3.Tenderer's actual or intended country of registration: *[insert actual or intended country of registration]*
4.Tenderer'syear of registration: *[insert Tenderer's year of registration]*
5.Tenderer'sAddress in country of registration: *[insert Tenderer's legal address in country of registration]*
6.Tenderer's Authorized Representative Information Name: *[insert Authorized Representative's name]* Address: *[insert Authorized Representative's Address]* Telephone/Fax numbers: *[insert Authorized Representative's telephone/fax numbers]* Email Address: *[insert Authorized Representative's email address]*
7. Attached are copies of original documents of *[check the box(es) of the attached original documents]* ☐ For Kenyan Tenderers a current tax clearance certificate or tax exemption certificate issued by the the Kenya Revenue Authority in accordance with ITT 3.14. ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of registration of the legal entity named above, in accordance with ITT3.4. ☐ In case of JV, letter of intent to form JV or JV agreement, in accordance with ITT 3.1. ☐ In case of state-owned enterprise or institution, in accordance with ITT4.6 documents establishing: (i) Legal and financial autonomy (ii) Operation under commercial law (iii) Establishing that the tenderer is not under the supervision of the Procuring Entity 2. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

TENDERER'S ELIGIBILITY- CONFIDENTIAL BUSINESS QUESTIONNAIRE FORM

a) Instruction to Tenderer

Tender is instructed to complete the particulars required in this Form, *one form for each entity if Tender is a JV*. Tenderer is further reminded that it is an offence to give false information on this Form.

A. Tenderer's details

	ITEM	DESCRIPTION
1	Name of the Procuring Enti	
2	Name of the Tenderer	
3	Full Address and Contact Details of the Tenderer.	1. Country 2. City 3. Location 4. Building 5. Floor 6. Postal Address 7. Name and email of contact person.
4	Reference Number of the Tender	
5	Date and Time of Tender Opening	
6	Current Trade License No and Expiring date	
7	Maximum value of busines which the Tenderer handles	
8		

General and Specific Details

b) Sole Proprietor, provide the following details.

Name in full_____

Age_____

Nationality_____

Country of Origin_____

c) Citizenship _____Partnership, provide the following details.

	Names of Partners	Nationality	Citizenship	% Shares owned

(d) Registered Company, provide the following details.

i) Private or public Company_____

_____

ii) State the nominal and issued capital of the Company:- Nominal Kenya Shillings (Equivalent)..... Issued Kenya Shillings (Equivalent).....

iii) Give details of Directors as follows.

	Names of Director	ality	Citizenship	% Shares owned

e) DISCLOSURE OF INTEREST- Interest of the Firm in the Procuring Entity.

i) Are there any person/persons in.....(*Name of Procuring Entity)* who has an interest or relationship in this firm?

Yes/No..... If yes, provide details as follows.

	Names of Person	Designation in the Procuring Entity	Interest or Relationship Tenderer

ii) Conflict of interest disclosure

	Type of Conflict	Disclosure YES OR NO	If YES provide details of th relationship with Tenderer
1	Tenderer is directly or indirectly controlled is under common control with another tend		
2	Tenderer receives or has received any direc indirect subsidy from another tenderer.		
3	Tenderer has the same legal representative another tenderer		
4	Tender has a relationship with another tenc directly or through common third parties, t it in a position to influence the tender of ar tenderer, or influence the decisions of the Procuring Entity regarding this tendering p		
5	Any of the Tenderer's affiliates participate consultant in the preparation of the design technical specifications of the works that ar subject of the tender.		
6	Tenderer would be providing goods, works consulting services or consulting services implementation of the contract specified in Tender Document.		
7	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who are directly or indire involved in the preparation of the Tender document or specifications of the Contract the Tender evaluation process of such cont		
8	Tenderer has a close business or family relationship with a professional staff of the Procuring Entity who would be involved implementation or supervision of the such Contract.		
9	Has the conflict stemming from such relati stated in item 7 and 8 above been resolved manner acceptable to the Procuring Entity throughout the tendering process and execu the Contract.		

f) Certification

On behalf of the Tenderer, I certify that the information given above is correct.

Full Name_____

Title or Designation_____

_____ _____

(Signature) *(Date)*

TENDERER'S JV MEMBERS INFORMATION FORM

[The tenderer shall fill in this Form in accordance with the instructions indicated below. The following table shall be filled in for the tenderer and for each member of a Joint Venture]].

Date:.....*[insert date (as day, month and year) of Tender submission].*

Tender Name and Identification:.....*[insert identification* Alternative No.:.....*[insert identification No if this is a Tender for an alternative].*

Page_____of_____pages

1. Tenderer's Name: *[insert Tenderer's legal name]*
2. Tenderer's JV Member's name: *[insert JV's Member legal name]*
3. Tenderer's JV Member's country of registration: *[insert JV's Member country of registration]*
4. Tenderer's JV Member's year of registration: *[insert JV's Member year of registration]*
5. Tenderer's JV Member's legal address in country of registration: *country of registration]* *[insert JV's Member legal address in*
6. Tenderer's JV Member's authorized representative information Name: *[insert name of JV's Member authorized representative]* Address: *[insert address of JV's Member authorized representative]* Telephone/Fax numbers: *[insert telephone/fax numbers of JV's Member authorized representative]* Email Address: *[insert email address of JV's Member authorized representative]*
7. Attached are copies of original documents of *[check the box(es) of the attached original documents]* ☐ Articles of Incorporation (or equivalent documents of constitution or association), and/or documents of the legal entity named above, in accordance with ITT 4.4. registration ☐ In case of a state-owned enterprise or institution, documents establishing legal and financial autonomy, operation in accordance with commercial law, and that they are not under the supervision of the Procuring Entity, in accordance with ITT4.6. 8. Included are the organizational chart, a list of Board of Directors, and the beneficial ownership.

Price Schedule Forms

*[The tenderer shall fill in these Price Schedule Forms in accordance with the instructions indicated. The list of line items in column 1 of the **Price Schedules** shall coincide with the List of Goods and Related Services specified by the Procuring Entity in the Schedule of Requirements.]*

PRICE SCHEDULE FOR GOODS

Name of tenderer_____ Tender Number _____Page _____ of _____

SCHEDULE I

PRICE SCHEDULE FOR GOODS

No.	Description	UoM	QTY	Unit price	Total Amount
1	Industrial Operator Workstations fully installed with licensed HMI application.	Pc	5		
2	Industrial plant information workstation.	Pc	1		
3	Industrial host servers complete with necessary hardware components, software, licences, accessories, features and device.	Unit	2		
4	M580 PLC complete with Hot standby CPUs, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1		
5	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1		
6	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFE cabinet.	Unit	3		
7	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at BJA cabinet.	Unit	1		
8	19"- Compact Industrial PC Panel mount touch screen Display, fully installed with licenced HMI application (to be mounted at new local control panel at engine hall).	Unit	1		
9	Engineering Workstation –Laptop equipped with all necessary one-off licenses for the HMI (server HMI and Local HMI software) and PLC	Unit	1		

	data/variables management tools at development level of the applications.				
10	42U cabinet fully installed with power supply unit and sockets, cable managers, patch panels, networking cables, cooling fans.	Unit	2		
11	Un-interruptible power supply	Unit	1		
12	Local control cabinet	Pc	1		
13	SCADA gateway	Pc	1		
14	Rack mount Industrial Ethernet Switches	Pc	2		
15	KVM console with switch	Pc	1		
16	Rack mount Network Time Server	Pc	1		
17	Cyber security devices-Fire wall	Pc	1		
18	Networking Tools and accessories	Lot	1		
19	Electrical accessories	Lot	1		
SUB TOTAL					
16% VAT					
GRAND TOTAL					
CURRENCY (Inclusive of all taxes, DDP, Kipevu III Store Incoterms 2020)					

Name of tenderer_____ Tender Number Page of

SCHEDULE II

PRICE SCHEDULE FOR SERVICES

No.	Description	UoM	QTY	Unit price	Total Amount
1	Design, Installation, testing & Commissioning of redundant server-based Plant HMI system	Au	1		
2	Design, Installation, testing & Commissioning of Hot standby M580 PLC system for one Diesel engine.	Unit	1		
3	On the job and class room Factory Training	Au	1		
4	Site Training	Au	1		
	SUB TOTAL				
	Discount (%) if any				
	SUB TOTAL				
	16% VAT				
	Total Cost to Kipevu I store				
	Country of Origin				
	Currency of Tender				
	Delivery Period				

Name of tenderer_____ Tender Number Page of

SCHEDULE III

PRICE SCHEDULE FOR SPARE PARTS

No.	Description	UoM	QTY	Unit price	Total Amount
1	Digital Input Card	pc	2		
2	Digital Output Card	Pc	1		
3	RTD Card	Pc	1		
4	Thermocouple Card	pc	1		
5	Analogue Input cards	Pc	1		
6	Analogue Output cards (8-channel)	Pc	1		
7	CPU (Hot standby)	Pc	1		
8	Network Card (control network module)	Pc	1		
9	Remote I/O Network Cards	Pc	1		
10	Power Supply Units (one (1) for each type used)	Lot	1		
	SUB TOTAL				
	16% VAT				
	Total Cost to Kipevu I store				
	Country of Origin				
	Currency of Tender				
	Delivery Period				

Name of tenderer_____ Tender Number Page of

RECOMMENDED TWO (2) SPARE PARTS

No.	Description	UoM	QTY	Unit price
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

FINAL TENDER PRICE SCHEDULE

No.	Description	Total Price
1	Schedule I: Price Schedule for Goods	
2	Schedule II: Price Schedule for Services	
3	Schedule III: Price schedule for Spare Parts	
	GRAND TOTAL, DDP KIPEVU III POWER STATION(Inclusive of all taxes)	
	CURRENCY	

TENDERER'S NAME: _____

TENDERER'S SIGNATURE_____

COMPANY'S RUBBER STAMP_____

DELIVERY PERIOD_____

ITEMISED COST OF SELECTED GOODS, SERVICES & WORKS

[FOR INFORMATION PURPOSE ONLY – THIS SHALL NOT BE CONSIDERED IN EVALUATION AND SHOULD NOT BE INCLUDED IN THE FINAL PRICE SCHEDULE ABOVE]

SCHEDULE IV

No.	Description	UoM	Unit price	16% VAT	Total Amount
1	Wiring an additional Input Signal to PLC controller cards	AU			
2	Adding an input signal to PLC program	AU			
3	Adding an input signal into display (screens) in all Operator Screens	AU			
4	Wiring an additional output signal from PLCS cards to the terminal blocks of panel	AU			
5	Adding a command from operator screens to the PLC	AU			
	CURRENCY (Inclusive of all taxes, DDP, Kipevu III Store Incoterms 2020)				

Date..... *[insert date]**

[For previously imported Goods, the quoted price shall be distinguishable from the original import value of these Goods declared to customs and shall include any rebate or mark-up of the local agent or representative and all local costs except import duties and taxes, which have been and/or have to be paid by the Procuring Entity. For clarity, the tenderers are asked to quote the price including import duties, and additionally to provide the import duties and the price net of import duties which is the difference of those values.]

TENDERER'S NAME: _____

TENDERER'S SIGNATURE_____

COMPANY'S RUBBER STAMP_____

DELIVERY PERIOD_____

47

FORM OF TENDER SECURITY - DEMAND BANK GUARANTEE

Beneficiary: _____

ITT No: _____

Date: _____

TENDER GUARANTEE No.: _____

Guarantor: _____

1. We have been informed that_____(hereinafter called "the Applicant") has submitted or will submit to the Beneficiary its Tender (hereinafter called "the Tender") for the execution of_____under Request for Tenders No._____("the ITT").

2. Furthermore, we understand that, according to the Beneficiary's conditions, Tenders must be supported by a Tender guarantee.

3. At the request of the Applicant, we, as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of_____(_____) upon receipt by us of the Beneficiary's complying demand, supported by the Beneficiary's statement, whether in the demand itself or a separate signed document accompanying or identifying the demand, stating that either the Applicant:

a) has withdrawn its Tender during the period of Tender validity set forth in the Applicant's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Applicant; or

b) having been notified of the acceptance of its Tender by the Beneficiary during the Tender Validity Period or any extension thereto provided by the Applicant, (i) has failed to execute the contract agreement, or (ii) has failed to furnish the Performance.

46

4. This guarantee will expire: (a) if the Applicant is the successful Tenderer, upon our receipt of copies of the contract agreement signed by the Applicant and the Performance Security and, or (b) if the Applicant is not the successful Tenderer, upon the earlier of (i) our receipt of a copy of the Beneficiary's notification to the Applicant of the results of the Tendering process; or (ii)twenty-eight days after the end of the Tender Validity Period.

5. Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

_____

*[signature(s)]*FORM OF TENDER SECURITY (TENDER BOND)

[The Surety shall fill in this Tender Bond Form in accordance with the instructions indicated.]

BOND NO. _____

1. BY THIS BOND.....*[name of tenderer]* as Principal (hereinafter called "the Principal"),

and..... *[name, legal title, and address of surety],* **authorized to transact business in** *[name of country of Procuring Entity],* as Surety (hereinafter called "the Surety"), are held and firmly bound unto..... *[name of Procuring Entity]* as Obligee (hereinafter called "the Procuring Entity") in the sum of.....*[amount of Bond][1] [amount in words]*, for the payment of which sum, well and truly to be made, we, the said Principal and Surety, bind ourselves, our successors and assigns, jointly and severally, firmly by these presents.

2. WHEREAS the Principal has submitted or will submit a written Tender to the Procuring Entity dated the _____ day_____of_____, 20_____, for the supply of_____*[name of Contract]* (hereinafter called the "Tender").

3. NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal:

a) has withdrawn its Tender during the period of Tender validity set forth in the Principal's Letter of Tender ("the Tender Validity Period"), or any extension thereto provided by the Principal; or

b) having been notified of the acceptance of its Tender by the Procuring Entity during the Tender Validity Period or any extension thereto provided by the Principal; (i) failed to execute the Contract agreement; or
(ii) has failed to furnish the Performance Security, in accordance with the Instructions to tenderers ("ITT") of the Procuring Entity's Tendering document.

then the Surety undertakes to immediately pay to the Procuring Entity up to the above amount upon receipt of the Procuring Entity's first written demand, without the Procuring Entity having to substantiate its demand, provided that in its demand the Procuring Entity shall state that the demand arises from the occurrence of any of the above events, specifying which event(s) has occurred.

4. The Surety hereby agrees that its obligation will remain in full force and effect up to and including the date 30 days after the date of expiration of the Tender Validity Period set forth in the Principal's Letter of Tender or any extension thereto provided by the Principal.

5. IN TESTIMONY WHEREOF, the Principal and the Surety have caused these presents to be executed in their respective names this____day of_____20_____.

Principal:___ Corporate Seal (where appropriate)

Surety: _____

_____ *(Signature)*

(Printed name and title)

_____ *(Signature)*

(Printed name and title)

[1]The amount of the Bond shall be denominated in the currency Kenya shillings or the equivalent amount in a freely convertible currency.

FORM OF TENDER-SECURING DECLARATION

[The Bidder shall complete this Form in accordance with the instructions indicated]

Date:.....*[insert date (as day, month and year) of Tender Submission]*

Tender No.:.....*[insert number of tendering process]*

To:.....*[insert complete name of*

Purchaser] I/We, the undersigned, declare that:

1. I/We understand that, according to your conditions, bids must be supported by a Tender-Securing Declaration.

2. I/We accept that I/we will automatically be suspended from being eligible for tendering in any contract with the Purchaser for the period of time of .....*[insert number of months or years]* starting on .....*[insert date]*, if we are in breach of our obligation(s) under the bid conditions, because we – (a) have withdrawn our tender during the period of tender validity specified by us in the Tendering Data Sheet; or (b) having been notified of the acceptance of our Bid by the Purchaser during the period of bid validity, (i) fail or refuse to execute the Contract, if required, or (ii) fail or refuse to furnish the Performance Security, in accordance with the instructions to tenders.

3. I/We understand that this Tender Securing Declaration shall expire if we are not the successful Tenderer(s), upon the earlier of:

a) our receipt of a copy of your notification of the name of the successful Tenderer; or

b) thirty days after the expiration of our Tender.

4. I/We understand that if I am/we are/in a Joint Venture, the Tender Securing Declaration must be in the name of the Joint Venture that submits the bid, and the Joint Venture has not been legally constituted at the time of bidding, the Tender Securing Declaration shall be in the names of all future partners as named in the letter of intent.

Signed:……..…….....

Capacity / title (director or partner or sole proprietor, etc.) …….……. ….....

Name: …….....

Duly authorized to sign the bid for and on behalf of: .....*[insert complete name of*

Tenderer]. Dated on ..... day of ..... *[Insert date of*

signing].

Seal or stamp.

MANUFACTURER'S AUTHORIZATION FORM

[The tenderer shall require the Manufacturer to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the Manufacturer and should be signed by a person with the proper authority to sign documents that are binding on the Manufacturer. The tenderer shall include it in its Tender, if so indicated in the ***TDS****.]*

Date: .....*[insert date (as day, month and year) of Tender submission]*

ITT No.:.....*[insert number of ITT clause]*

Alternative No.:.....*[insert identification No if this is a Tender for an alternative]*

To:.....*[insert complete name of Procuring Entity]* WHEREAS

We..... *[insert complete name of Manufacturer],* who are official manufacturers of.....*[insert type of goods manufactured],* having factories at [insert full address of Manufacturer's factories], do hereby authorize *[insert complete name of tenderer]* to submit a Tender the purpose of which is to provide the following Goods, manufactured by us..... *[insert name and or brief description of the Goods],* and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 28 of the General Conditions of Contract, with respect to the Goods offered by the above firm.

Signed: .....*[insert signature(s) of authorized representative(s) of the Manufacturer]*

Name: .....*[insert complete name(s) of authorized representative(s) of the Manufacturer]*

Title: .....*[insert title]*

Dated on_____day of_____,_____*[insert date of signing]*

PART 2: SUPPLY REQUIREMENTS

Section V - Schedule of Requirements

Notes for Preparing the Schedule of Requirements

The Schedule of Requirements shall be included in the Tendering document by the Procuring Entity, and shall cover, at a minimum, a description of the goods and services to be supplied and the delivery schedule.

The objective of the Schedule of Requirements is to provide sufficient information to enable tenderers to prepare their Tenders efficiently and accurately, in particular, the Price Schedule, for which a form is provided in Section IV. In addition, the Schedule of Requirements, together with the Price Schedule, should serve as a basis in the event of quantity variation at the time of award of contract pursuant to ITT 42.1.

The date or period for delivery should be carefully specified, taking into account (a) the implications of delivery terms stipulated in the Instructions to tenderers pursuant to the *Incoterms* rules that "delivery" takes place when goods are delivered **to the final place of delivery**, and (b) the date prescribed herein from which the Procuring Entity's delivery obligations start (i.e., notice of award, contract signature, opening or confirmation of the letter of credit).

SCHEDULE OF REQUIREMENTS

SCHEDULE I

SCHEDULE FOR GOODS

No.	Description	UoM	QTY
1	Industrial Operator Workstations fully installed with licensed HMI application.	Pc	5
2	Industrial plant information workstation.	Pc	1
3	Industrial host servers complete with necessary hardware components, software, licences, accessories, features and device.	Unit	2
4	M580 PLC complete with Hot standby CPUs, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1
5	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1
6	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFE cabinet.	Unit	3
7	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at BJA cabinet.	Unit	1
8	19"- Compact Industrial PC Panel mount touch screen Display, fully installed with licenced HMI application (to be mounted at new local control panel at engine hall)	Unit	1
9	Engineering Workstation –Laptop equipped with all necessary one-off licenses for the HMI (server HMI and Local HMI software) and PLC	Unit	1

	data/variables management tools at development level of the applications.		
10	42U cabinet fully installed with power supply unit and sockets, cable managers, patch panels, networking cables, cooling fans.	Unit	2
11	Un-interruptible power supply	Unit	1
12	Local control cabinet	Pc	1
13	SCADA Gateway	Pc	1
14	Rack mount Industrial Ethernet Switches	Pc	2
15	KVM console with switch	Pc	1
16	Rack mount Network Time Server	Pc	1
17	Cyber security devices-Fire wall	Pc	1
18	Networking Tools and accessories	Lot	1
19	Electrical accessories	Lot	1

SCHEDULE OF REQUIREMENT FOR SERVICES

SCHEDULE II

No.	Description	UoM	QTY
1	Design, Installation, testing & Commissioning of redundant server-based Plant HMI system	Au	1
2	Design, Installation, testing & Commissioning of Hot standby M580 PLC system for one Diesel engine.	Unit	1
3	On the job and class room Factory Training	Au	1
4	Site Training	Au	1

SCHEDULE OF REQUIREMENT FOR PARTS

SCHEDULE III

No.	Description	UoM	QTY
1	Digital Input Card	pc	2
2	Digital Output Card	Pc	1
3	RTD Card	Pc	1

4	Thermocouple Card	pc	1
5	Analogue Input cards	Pc	1
6	Analogue Output cards (8-channel)	Pc	1
7	CPU (Hot standby)	Pc	1
8	Network Card (control network module)	Pc	1
9	Remote I/O Network Cards	Pc	1
10	Power Supply Units (one (1) for each type used)	Lot	1

1. Technical Specifications

1.1 The purpose of the Technical Specifications (TS), is to define the technical characteristics of the Goods and Related Services required by the Procuring Entity. The Procuring Entity shall prepare the detailed TS consider that:

i) The TS constitute the benchmarks against which the Procuring Entity will verify the technical responsiveness of Tenders and subsequently evaluate the Tenders. Therefore, well-defined TS will facilitate preparation of responsive Tenders by tenderers, as well as examination, evaluation, and comparison of the Tenders by the Procuring Entity.

ii) The TS shall require that all goods and materials to be incorporated in the goods be new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided for otherwise in the contract.

iii) The TS shall make use of best practices. Samples of specifications from successful similar procurements in the same country or sector may provide a sound basis for drafting the TS.

iv) The PPRA encourages the use of metric units.

v) Standardizing technical specifications may be advantageous, depending on the complexity of the goods and the repetitiveness of the type of procurement. Technical Specifications should be broad enough to avoid restrictions on workmanship, materials, and equipment commonly used in manufacturing similar kinds of goods.

vi) Standards for equipment, materials, and workmanship specified in the Tendering document shall not be restrictive. Recognized international standards should be specified as much as possible. Reference to brand names, catalogue numbers, or other details that limit any materials or items to a specific manufacturer should be avoided as far as possible. Where unavoidable, such item description should always be followed by the words "or substantially equivalent." When other particular standards or codes of practice are referred to in the TS, whether from the Procuring Entity's or from other eligible countries, a statement should follow other authoritative standards that ensure at least a substantially equal quality, then the standards mentioned in the TS will also be acceptable.

vii) Reference to brand names and catalogue numbers should be avoided as far as possible; where unavoidable the words "or at least equivalent" shall always follow such references.

viii) Technical Specifications shall be fully descriptive of the requirements in respect of, but not limited to, the following:

a) Standards of materials and workmanship required for the production and manufacturing of the Goods.

b) Any sustainable procurement technical requirements shall be clearly specified.

1.2 To encourage tenderers' innovation in addressing sustainable procurement requirements, as long as the Tender evaluation criteria specify the mechanism for monetary adjustments for the purpose of Tender comparisons, tenderers may be invited to offer Goods that exceeds the specified minimum sustainable procurement requirements.

i) Detailed tests required (type and number).

ii) Other additional work and/or Related Services required to achieve full delivery/completion.

iii) Detailed activities to be performed by the Supplier, and participation of the Procuring Entity thereon.

iv) List of detailed functional guarantees covered by the Warranty and the specification of the liquidated damages to be applied in the event that such guarantees are not met.

1.3 The TS shall specify all essential technical and performance characteristics and requirements, including guaranteed or acceptable maximum or minimum values, as appropriate. Whenever necessary, the Procuring Entity shall include an additional ad-hoc Tendering form (to be an Attachment to the Letter of Tender), where the tenderer shall provide detailed information on such technical performance characteristics in respect to the corresponding acceptable or guaranteed values.

1.4 When the Procuring Entity requests that the tenderer provides in its Tender a part or all of the Technical Specifications, technical schedules, or other technical information, the Procuring Entity shall specify in detail the nature and extent of the required information and the manner in which it has to be presented by the tenderer in its Tender.

1.5 If a summary of the Technical Specifications(TS) has to be provided, the Procuring Entity shall insert information in the table below. The tenderer shall prepare a similar table to justify compliance with the requirements.

Summary of Technical Specifications: The Goods and Related Services shall comply with following Technical Specifications and Standards:

Item No	Name of Goods or Related Se	Technical Specifications and Standards
[insert item N	[insert name]	[insert TS and Standards]

NB: Drawings indicated below are attached at the Appendix.

Appendix I - KDP III DCS HMI Architecture Existing
Appendix II - KDP III DCS HMI upgrade drawing proposed
Appendix III -Kipevu III GIS control system existing
Appendix IV -KDP III Local control panel proposed

1. PLC, HMI SPECIFICATIONS AND REQUIREMENTS

1.1. GENERAL INTRODUCTION

Kipevu III diesel Power Station is a thermal power Station located at Mombasa. The Station comprises of seven units each rated at 17.1MW. The total Station capacity is 120MW.

The distributed control system (DCS) was developed, configured and commissioned by Wartsila Oy of Finland during inception in 2011. Since then the system has due for upgrade owing to new package releases and operating system obsolescence.
The unit control PLCs are of Schneider (quantum 140CPU67160) make. In total there are eight (8) PLCs, one for each unit and one for common systems. The respective unit PLCs monitors, controls and supervision of the unit process. The programming software used is Unity Pro.
The HMI software used is Wartsila operator interface system (WOIS) Intouch 10.0.0 Patch2. This tool serves as the control panel where commands and monitoring of the plant is carried out. The Wartsila Information system environment (WISE) which manages plant production, technical and availability reports and the Continuous emission measurement system (CEMS).
Both PLC and HMI software are packaged under Wartsila control system portfolio.
There are three operator stations and one wise terminal at the control room and two operator stations in the administration block.
The input/output signals to and from the standalone equipment PLCs e.g. water treatment plant and fire protection system are hard wired to the common PLC. Signals from the GIS station are through an OPC link and to the customer/KPLC are through the RTU560 at the GIS house.

1.2. GENERAL SCOPE OF WORK FOR HMI, PLC

The overall goal of this tender is to upgrade the DCS Human Machine Interface (HMI) system, one (1) Engine PLC control system for Kipevu III thermal power plant, adapt to the existing automatic plant control system and transfer knowledge to the KenGen staff so as to support the system going forward.
The general scope shall be realized through the following works and supplies:

1.2.1. Design/engineering of a new DCS HMI for the plant as per the proposed architecture and tender specifications. This shall include design, assembly and supply of two(2) new 42U server cabinet fully installed with ; two (2) redundant industrial server, one (1)KVM switch, one(1) time server, two (2) ethernet switches, one(1)firewall ,five(5) industrial operator stations, one(1) plant information station.
1.2.2. Design/engineering of of one (1) engine's PLC system as per the proposed architecture and tender specifications. This shall include design, assembly and supply of new PLCs and its associated local and remote IO modules and associated accessories. The existing control cabinets CFE, CFC and BJA shall be retained.
1.2.3. The contractor shall design, integrate, install, test and commission the GIS HMI (ABB Micro SCADA) functionalities in the new DCS HMI at the Kipevu 3 control room.
1.2.4. One (1) Panel Mount Compact industrial PC with 19" Display shall be fitted on a new Local Control Panel at the Engine Upper Floor.
1.2.5. General arrangement drawings of equipment proposed by the vendor shall be approved by KenGen before fabrication.
1.2.6. Statutory pre-shipment inspection, shipment, customs clearance, insurance and storage of the system before installation and delivery to the site.
1.2.7. Tag identification of all signals from field before removal of existing one (1) engine PLC and the DCS HMI.
1.2.8. Removal of existing PLC control System for the first (one) engine which includes components in CFC, CFE and BJA panels.
1.2.9. Vendor shall make a DCS HMI and PLC backups of existing system configuration for system engineering and connectivity.
1.2.10. All recovered PLC modules and associated accessories shall be handed over to KenGen.

1.2.11. Erection, installation, site acceptance test and commissioning of new DCS HMI and one (1) PLC for one engine along with all associated hardware, and software by the contractor.
1.2.12. Installation, field testing, loop checking, commissioning and field acceptance of the system.
1.2.13. Installation and commissioning assistance of free issue items if any (owner supplied).
1.2.14. Vendor shall submit the BOM & price schedule with itemized price break-down including mandatory spares and recommended two (2) year spares for smooth running of the system.
1.2.15. Vendor shall provide two (2) complete sets of digital video disks (DVD) back-up configuration storage for each system, containing operating programs, diagnostic programs, system configuration, etc.
1.2.16. Factory Acceptance Testing, on-the-job training and site acceptance testing of new DCS HMI and one (1) engine PLC system.
1.2.17. Site training for client staff following successful commissioning of the project.
1.2.18. Preparation of project documentation – design for approval, assembly and as-built-drawings, commissioning records, including operation and maintenance manuals, OEM manuals among other documentation that may be necessary.
1.2.19. All PCs provided as part of this project shall be equipped with the latest available processor with maximum processing speed.
1.2.20. The contractor shall provide all required tools for the site works at his cost.
1.2.21. Provision of personnel, expertise, tools, equipment, temporary facilities and consumables required for this purpose shall be part of the Contractor's responsibility.
1.2.22. Development of suitable and acceptable work program to have minimum effect on the availability of the plant (minimum plant downtime due to the replacement works and commissioning).
1.2.23. All reasonable precautions shall be taken in the design of equipment to ensure safety of personnel concerned with the operation and maintenance of the equipment.
1.2.24. The DCS HMI system shall be designed in a server client concept where all the operator stations shall draw and send plant commands through the server.
1.2.25. The server shall thus be able to communicate with all the PLCs via a suitable modern industrial communication protocol. A high availability system is recommended especially at the server end. A redundant server system is recommended with a failover configured to mitigate any data loss.
1.2.26. The redundant server system shall also serve as virtual historians for the control data and events.
1.2.27. The System profiles shall be in such a way that authorized users will execute functions according to their specific profile capabilities (Define different user profiles).
1.2.28. The server Operating system shall be Windows Server 2019 or newer, while the operator stations will run on Windows 11 or the latest.
1.2.29. A 2N UPS system, adequately sized with minimum spare capacity of 40% and autonomy of 2 hours, shall be provided by the contractor for power supply to the server cabinet equipment and operator workstations.
1.2.30. The two servers shall be in hot standby redundant mode. These servers shall also act as standard Network Time Protocol server for the rest of devices in the LAN (NTP clients). In the event of server failure, the thick clients (Operator work stations) shall continue with plant operation.
1.2.31. The contractor shall supply a GPS system (LANTIME M300, Meinberg or equivalent) that can support Ethernet interface to the servers and the entire network.
1.2.32. Supply and lay power and signal cables from the server system to the control network and all server clients and any other device (the proposed server location at the Kipevu III central control room). Bidders to confirm location during site visit.
1.2.33. The contractor shall be responsible for gathering required data and information necessary for the execution of this project.

1.3. OVERALL PROJECT SCHEDULE

1.3.1. The total project schedule should not exceed eight (8) months starting from the signing of the contract. Contractor shall provide detailed project delivery plan to meet this time frame. The activities shall be carried out in consultation with plant management for minimum plant outage and disruption to plant's normal operation.

1.3.2. Contractor shall prepare a detailed complete work schedule showing the sequence of activities (work) to be approved by KenGen.

1.4. QUALIFICATION OF THE CONTRACTOR

1.4.1. The Contractor shall either be the OEM of the offered DCS HMI or a System Integrator shall submit a letter of support from the OEM for performance guarantee.

1.4.2. The contractor shall further provide proof of support and commitment to execute the project (design, engineering, Factory Acceptance Test-FAT and commissioning). Hence the contractor is required to get the project fully engineered and factory tested at OEM's factory witnessed by the buyer's representative(s) – the test factory must be fully owned by the OEM.

1.4.3. The contractor to execute the project (design, engineering, Factory Acceptance Test-FAT, Installation, and commissioning) shall meet the following minimum requirements:

a) Must have successfully executed at least two (2) PLC projects for large power generation plants in the last ten (10) years – Attach evidence

b) Must have successfully executed at least two (2) Server based HMI projects for large power generation plants in the last ten (10) years – Attach evidence

c) Must have successfully executed at least two (2) HV substation SCADA projects for large power generation plants in the last ten (10) years – Attach evidence

d) Shall be fully owned by the principal (OEM) or if a System Integrator shall submit a letter of support from the OEM for performance guarantee – Bidder must attach evidence.

1.4.4. Site visit, at the vendor's cost, to KenGen Kipevu 3 Diesel Plant to evaluate the job to be undertaken before submitting the offer is mandatory – No offer shall be considered for technical evaluation in absence of this activity.

1.4.5. Contractor team shall be at a minimum have a project manager who has at least ten (10) years of experience in handling distributed control and automation projects and a Commissioning engineer with at least 10 years' experience in commissioning of distributed control and automation systems.

1.4.6. The Curriculum Vitae (CVs) of the project manager and the commissioning engineer shall be attached as a minimum for the contractor's team.

1.5. TECHNICAL RESPONSIBILITIES

1.5.1. Design and engineering stage.

The following shall be the responsibilities of the client and contractor on the engineering/technical aspect of the contract during its implementation. Where these responsibilities may conflict with the commercial responsibilities clearly spelt out in the contract, the commercial responsibilities/obligations prevail over the technical responsibilities/obligations.

1.5.1.1. The design and engineering of the project scope shall follow the award and signing of the contract between the client and the contractor. During the design & engineering stage, the client shall submit details, documents or such information as shall be requested by the contractor for execution of the project. Where the information such required may not be available, the client shall inform the contractor in good time and the contractor shall take the necessary action to progress the contract despite lack of information.

1.5.1.2. The contractor shall send drawings, datasheets, calculations among other technical information/documents to the client for approval and comments. The client shall review all documents, designs and drawings submitted within three weeks of their submission by the contractor. A copy of each document and item of data will be returned to the Contractor marked "APPROVED", or "APPROVED AS NOTED", or "NOT APPROVED".

1.5.1.3. Drawings/documents submitted by the contractor for approval will be checked / reviewed by the client and comments, if any, on the same will be sent to the contractor. It is the

responsibility of the contractor to incorporate correctly all the comments conveyed by the Client on the Contractor's drawings. If the Contractor is unable to incorporate certain comments in his drawings, he/she shall clearly state in his forwarding letter such non-compliance along with valid reasons and justification.

1.5.1.4. Comment of "NOT APPROVED" would imply the drawing has to be re-done as per comments given; meaning the client is not in agreement with the content, idea and implications of the drawing on the overall design and operation of the system. Comment of "APPROVED AS NOTED" shall imply the client agrees with the design/information or implications of the drawing but requires some changes to be implemented before approval.

1.5.1.5. Drawings and data requiring revision shall be promptly dealt with and resubmitted as aforementioned. Thereafter, changes shall NOT be made in the Contractor's drawing without written permission of the Client Engineer. The above procedure shall be repeated for all authorized changes.

1.5.1.6. Any work performed (including purchase, assembly, ordering of material (and/or components) by the contractor prior to receipt of drawings/designs stamped 'APPROVED' by the client shall be at the risk of the contractor. After drawing has been returned 'APPROVED', the contractor may proceed to the next stage of the contract.

1.5.1.7. All drawings and data supplied by the Contractor after the date of contract, which cover changes in the work, extra work, or which supplement existing drawings and data shall, upon approval by the Client Engineer, form part of the contract documents. If, at any time before the completion of the work, changes are made necessitating revision of approved drawings, the contractor shall make such revisions and proceed in the same routine as for the original approval.

1.5.1.8. Subsequent changes contemplated by the Contractor shall be indicated on revised drawings and data resubmitted for approval. The Contractor shall make any changes in the design which are considered necessary to make the work conform to the provisions and intent of the specification without additional cost to KenGen.

1.5.1.9. To expedite the delivery and return of the required drawings, scanned drawings shall be used and sent to the following KenGen E-mail addresses–

To. anthonyk@kengen.co.ke
c.c. akatune@kengen.co.ke
pkanyi@kengen.co.ke
Or any other email supplied by the client.

1.5.1.10. All drawing submitted for approval or sent to the Client for any other reason may be sent by courier, email or a cloud storage managed by the contractor.

1.5.1.11. Approval of the Contractor's drawings and data shall in no way construe or imply relief of the Contractor from responsibility for any error or omission therein or from any obligation under the Contract.

1.6. OTHER RESPONSIBILITIES

1.6.1. During the site works, the contractor shall bear the following responsibilities

1.6.2. provide accommodation, hospitalities, travel to and from Mombasa, transport to and from power station for their staff at their cost.

1.6.3. Provide insurance cover for the contractor's staff during the entire contract duration.

2. DETAILED SCOPE OF WORK

2.1 HMI

2.1.1 Design, supply, install, test and commission two (2) servers system configured in redundant mode as per given specifications. One server shall be primary while the other one work as a hot standby server.

2.1.1 Both servers shall be able to fetch data from PLCs and other hardware independently. Similarly, the operator stations shall be able to fetch data from servers. Redundancy shall be provided for servers. i.e. if the primary server fails, the operator stations shall fetch data from the active server.

2.1.2 A total failure of both servers shall not affect the communication, monitoring, control and supervision of the PLCs by the operator work stations.

2.1.3 The servers shall be installed with HMI applications and the necessary one-off licenses for operation and control of the seven engines and associated power plant auxiliaries.

2.1.4 The operator work stations shall be installed with HMI applications and the necessary one-off licenses for operation and control of the seven engines and associated power plant auxiliaries.

2.1.5 The license keys shall be a dongle license.

2.1.6 The contractor shall supply an Engineering workstation (EWS)-laptop, tested and commissioned fully installed with the DCS HMI application.

2.1.7 The DCS HMI software development version license shall be a USB dongle license with a minimum of sixty thousand (60,000) tags.

2.1.8 The Engineering workstation (EWS) shall also be installed with latest version of a licensed PLC programming software.

2.1.9 The Engineering workstation (EWS) shall also be equipped with all necessary one-off licenses for the HMI and PLC data/variables management tools at development level of the applications. The client engineers/technicians shall have the engineer's access level necessary to improve/modify the HMI graphics, database and PLC programs if need be.

2.1.10 HMI application shall have inbuilt functionality to support Hot redundant server architecture.

2.1.11 Redundant server architecture will have support for redundancy in Data acquisition, Trending, Alarming and Event triggering.

2.1.12 The Contractor shall provide and install the necessary OPC server applications to enable future external Plant information interfaces through the firewall.

2.1.13 The server system shall be accessed via five (5) thick client operator workstations and one (1) plant information workstation in a fully assembled 42U cabinet.

2.1.14 The operator workstation monitors shall be connected to their respective PCs via KVM extenders.

2.1.15 The servers shall be supplied in a fully assembled 42U cabinet.

2.1.16 The contractor shall provide to Client for approval design architecture proposal together with technical specifications of the proposed hardware and software.

2.1.17 There shall be a Factory Acceptance Test (FAT) at the OEM premises as prescribed in the tender document.

2.1.18 There shall be a Site Acceptance Test (SAT) as prescribed in the tender document.

2.1.19 The contractor shall design, develop and interface HMI graphics for the effective, efficient and safe operation and control of the seven (7) engines and other power plant auxiliaries which shall at least be as per the existing HMI graphics.

2.1.20 The contractor shall design, integrate, install, test and commission the GIS HMI (ABB MicroSCADA) functionalities in the new DCS HMI at the Kipevu 3 control room.

2.2 SCADA Data Gateway

2.2.1 The contractor shall supply a SCADA gateway as per specifications in this tender document.

2.2.2 The SCADA Data Gateway shall act as an OPC to IEC61850 server for the purposes of supervision, control and data acquisition of the GIS substation for the new DCS HMI stations at the Central Control Room.

2.2.3 It shall also act as protocol converter (OPC to IEC 60870-5-104) for communication of Medium Voltage equipment data to the ABB RTU560 through the IEC 60870-5-104 protocol over the GIS ethernet network.

2.2.4 The SDADA Gateway shall be mounted at the existing RTU cabinet M 75 at the GIS House.

2.2.5 The power supply source shall be provided by the client at 110VDC at BEY911/912 panel at the GIS House. The approximate distance between the BEY911/912 panels and RTU cabinet (M +75) is 10 metres.

2.2.6 Any power distribution or communication accessories needed for achieving the supervision, control and data acquisition for the GIS IEDs and ABB RTU560 shall be determined and provided by the contractor.

2.2.7 The contractor shall configure the gateway for supervision, control and data acquisition for all the GIS Inteligent Electronic Devices (IEDs) i.e all RET615, all RED615, all REF545 and REB670 from the new DCS HMI at the Central Control Room. This shall be achieved through IEC61850 communication protocol.

2.2.8 The configuration, testing and commissioning of the supervision, control and data acquisition for the GIS IEDs shall not result to any substation downtime.

2.2.9 The contractor shall be liable for any malfunctioning any GIS IEDS resulting from any works during the execution of the project.

2.2.10 The contractor shall configure the gateway for telecommunication with the ABB RTU560 for all Plant Medium Voltage Equipment data as per existing signal list through IEC 60870-5-104. The Signal list shall be provided by the client.

2.2.11 Any reconfiguration of the ABB RTU560 as may be required for the purpose of achieving the existing functionalities shall be the responsibility of the contractor.

2.2.12 The contractor shall be liable for any malfunctioning of the ABB RTU560 resulting from any works during the execution of the project.

2.3 LOCAL HMI DISPLAY

2.3.1 The contractor shall supply a panel mount industrial PC with 19" LCD display with touch function for Local HMI.

2.3.2 The operation and monitoring functions of the specific Diesel Generator in the Local HMI shall be realized by applying the same HMI application as the one employed for the redundant server system.

2.3.3 The Local HMI thick client application shall be fully licensed. The license shall be an one -off type on a USB dongle.

2.3.4 The Contractor shall supply and install the control panel for installation of the panel mount industrial PC with 19" Display as per specifications in this tender document.

2.3.5 The Panel Mount Industrial PC shall be a thick client to the PLC system. It shall be able to execute all control, monitor and supervise the specific engine systems.

2.3.6 It shall be able to communicate with the engine PLC without the server connections. The local HMI shall be able to query engine-wise event list and logging from the redundant server system.

2.3.7 In the event of loss of communication with the server, the Local HMI shall be able to continue monitoring and controlling its specific engine uninterrupted. Only the event list and plant history shall not be accessible from the Local HMI during any server connection interruption.

2.3.8 The Local HMI shall be connected to the PLC (CFC panel) hot standby system through a fiber link.

2.3.9 The contractor shall supply, install and commission the necessary power supplies items and accessories for the complete installation of the Local HMI control panel. The available power supplies source is a 110VDC at CFE control panel approximately 5 meters away (the contractor shall be responsible for confirmation of the actual length on site).

2.4 CONTROLLER

The scope of work under this tender shall include:

2.4.1 The contractor shall Design, supply, install, test and commission a Hot standby PLC system for one (1) engine.

2.4.2 The contractor shall provide to Client for approval design architecture proposal together with technical specifications of the proposed hardware and software.

2.4.3 There shall be a Factory Acceptance Test (FAT) at the OEM premises as prescribed in this tender document.

2.4.4 There shall be a Site Acceptance Test (SAT) as prescribed in this tender document.

2.4.5 The contactor shall involve the client in the upgrade design and review of the hot standby PLC system hardware and software.

2.4.6 The contractor shall extract the control program using a licensed software tool from the existing Controller i.e 140CPU67160 and create a backup.

2.4.7 The contractor shall carefully remove existing PLC system hardware which includes;

a. At CFC Panel- Two (2) Hot stand by Controllers complete with its associated backplanes and one (1) Rack of local input/output modules except the input/output prefabricated terminal blocks.
b. At CFE Panel- Three (3) remote input/output Racks complete with its associated modules except the input/output prefabricated terminal blocks.
c. At BJA Panel- One (1) remote input/output Racks complete with its associated modules except the input/output prefabricated terminal blocks.
d. All coaxial communications links and accessories connecting the CFC, CFE and BJA panels.

2.4.8 The contractor shall document and handover all the recovered PLC hardware and associated accessories to the Client upon removal.

2.4.9 The contractor shall install the new Hot Standby PLC system, download the extracted back up PLC program, test and commission the system as per approved Site Acceptance Test procedures.

2.4.10 The following additional communication cards shall be installed that includes:

a. RS 485/232 module

2.4.11 The contractor shall install fibre communication links between CFE and CFC. Suitable media converters to be installed.

2.4.12 The contractor shall be expected to use the existing cable routes and cable management infrastructures.

2.4.13 The contractor shall train the client staff in accordance with the prescribed training syllabus in this tender document.

3. DETAILED TECHNICAL SPECIFICATIONS

3.1 HMI SOFTWARE APPLICATION

3.1.1 Configuration of HMI application using structural tree that allows the whole application to be seen at a glance. Single executable software for whole configuration like tags, alarms, communication, etc.

3.1.2 The HMI system should be capable of displaying Real time and historical data from the continuous history subsystems as well as from the event chronicle. Trends should be plotted on a graph. On-line archiving of trends should be possible. The trend Package should allow the operator to carry out the following:

a. Move forward and backward in time.
b. Zoom in on a particular area of the trend.
c. Select a particular pen (the engineering units' range of this pen is then displayed)
d. Position a hairline cursor to read off values and time stamp.
e. Print display charts

3.1.3 The HMI software shall have in built standard screen objects library for slider, browser, display, bar graphs, trends for real time, animation, toggle, momentary, transparent buttons, ActiveX Controls for windows-based System etc.

3.1.4 There shall be an object builder wherein custom objects can be added to library. Facilities to access all properties and functions related to each object in the application and facility to manipulate all the properties through the script. Cross-reference tool to show the total cross-references in the application.

3.1.5 The HMI software shall have communication drivers for standard PLC's and other devices. It shall be possible to connect multiple drivers simultaneously. It shall have features to support redundant communication/connections, communication failure detection and recovery

3.1.6 The HMI software can have control blocks like PID control blocks, sequencing, timers, on/off control, arithmetic, Boolean functions

3.1.7 The HMI System application should have a single configuration environment for configuring the whole project. The software should facilitate data entries at a single configuration environment to prevent human errors.

3.1.8 The software shall have in built script programming tool, function library, and cross reference tools; Quick help tutorial with on line help facility. It shall allow programming tool/inbuilt functions to log operator action, operator log in/logout, events data in runtime.

3.1.9 The project environment should have features like:

a. Creating the configuration files for the instruments.
b. Creating alarm groups.
c. IO manager for allocation of tags to the instruments.
d. Deploying the project to the operator station from the Development/ Engineering station.
e. Multiple level securities with password protection, facilities to lock executables to prevent unauthorized modification. It should have minimum of 4 levels of password so that configurations of the above features can be disabled/ enabled depending on password level.
f. There should be provision for supervisor who can add/ delete/ modify users.
g. Also, there should be provision for disabling all the control function. The GUI program should mask all other programs so that operator will be able to operate only GUI program. Other programs shall be available to only to a person with highest level of Password.
h. A centralized Password Storage database should be configurable, to allow the Operator to change the password from any client PC.

3.1.10 The HMI software shall have open connectivity, object oriented graphical programming methods and event driven architecture.

3.1.11 It shall read I/O's and assign internal variables (Process tags) and generate internal variables by mathematical operation like assigning special control signal computations as per the standard controller algorithms.

3.1.12 Animation links should be available for movement, position changes and more. It should include discrete, analog and string touch inputs.

3.1.13 All the alarms and events that occur should be time stamped at the controllers except for defined plant trip input signals which shall be timestamped at 1mS SOE input module.

3.1.14 Open Database Connectivity (ODBS) support and connectivity to standard Relational Data Base Management System (RDBMS), like Oracle, Sybase, and Microsoft SQL, Microsoft Access. (ICT to clarify)

3.1.15 Distributed real time networking with support for thin client server architecture, which enables true peer to peer communication between thin client to server and server to server.

3.1.16 On integration of Computerized Data Acquisition and Control System (CDAS), it shall be capable of providing deterministic, fast real time performance providing accurate process monitoring and control. Data update rate in run time should not be more than 1 sec.

3.1.17 Faceplates for all IO tags, control modules should be available by default in the HMI application software. It should allow some operator interaction with the device and provide an operational summary which should be displayed. The operator should be able to control the device by means of pushbuttons (for mode selection or for state selection on a digital device) or numeric values (for analog values such as setpoints). Numerical values can be set either by selecting the displayed value and entering a new value or by selecting the associated bar graph and ramping up or down.

3.1.18 The HMI system should have a faceplate for PID, Pulse Input, Analog Input, Device Control, and Input Selector function blocks etc. It should also contain a detail display for the PID parameters, and Device Control blocks.

3.1.19 The user interface shall support standard keyboards, function keys, mouse, touch screens and other pointing devices. The user interface should have a common and consistent look and feel. Context sensitive help with online tutorial shall be provided for fast development of HMI.

3.1.20 The display should be user configurable. Screen navigation shall be designed so that the operator can page through displays at different levels starting with over-view, area displays, group displays, fascia displays, current and historical trend groups etc. A permanent alarm banner should be provided for immediate indication of abnormal plant conditions.

3.1.21 Object Oriented GUI enabling quick development of screen objects with full animation and object library builder. Mimic display with 2D, 3D photo import facility, scrollable mimic, bitmap support, graphical library for automation symbols (including pumps, valves, faceplates, meters, check boxes etc.), capability to handle all depths of colours and settings of resolution in MS Windows. Fully animated- graphics support with built in translation, rotation and dynamic sizing facility.

3.1.22 Parameter display using screen objects like bar graph, trends, displays, gauges, browsers, animation, alarm windows, message boxes multivariable read displays, numeric readouts etc. and other GUI objects like pushbuttons, spin buttons, sliders, list boxes etc. shall be available.

3.1.23 Historical and real time trending with operator annotation. It shall also have necessary pan and zoom facilities. Tools that allow rapids searches through large amount of historical data shall be provided.

3.1.24 Operation Server/Viewer should allow to dynamically specify different historical file data sources for each of the pens on a trend chart. The Operation Server/Viewer should preferably permit minimum of 8 pens per trend chart. The users should be able to view historical data at any given time.

3.1.25 The system should allow for building graphics comprising of points across groups/areas. The areas are created for efficient alarm management. Group display should contain bar graph display of individual loops, their digital values & status display. In addition to this, one should have access to the tuning parameters, real time trends, historical & event trends. Auto/manual/remote selection for any loops or all loops should be possible from group display. Set point & alarm adjustment of any loop should also be possible from any display. This should be password protected.

3.1.26 The HMI system should be capable of displaying real time and historical data from the continuous history subsystems as well as from the event chronicle. Trends should be plotted on a graph. On-line archiving of trends should be possible. The trend package should allow the operator to carry out the following:

a. Move forward and backward in time.
b. Zoom in on a particular area of the trend.
c. Select a particular pen (the engineering units' range of this pen is then displayed).
d. Position a hairline cursor to read off values and time stamp.
e. Print display charts.
f. Simple & Complex alarm capabilities, multiple alarm facilities, multiple alarm priority levels, alarm filtering functions, alarm annunciation with color changes, automatic report generation of alarm history with date/time sorting, alarm logging, display, triggering of events/Function call etc. shall be available. Custom-built alarm report generation shall also be possible with text, graphics support. HMI application software should allow Pop –up messages/window to be configured to alert the operator in case of important alarms.

3.1.27 The real time database shall be capable to manage and store all process data. Database shall support sufficient number of discrete, real, integer and string variable tag names. Utilities to support database exporting/importing to /from spreadsheets, other databases, editors' etc. and ODBC support to share data with standard RDBMS like Oracle, Sybase, and Microsoft SQL etc. shall be available.

3.1.28 Data logging including event logging of set point adjustment and custom events shall be available.

3.1.29 Text and graphical reports based on real time and historic data, pre-configured alarm and event reports, shift-wise, daily, weekly reports, automatic and on request report printing shall be available. System shall be capable of providing accurate, customized reports.

3.1.30 Front end, Report viewing/Printing tool, customized as a part of HMI Application software will be developed by supplier or required Software for the same to be supplied configured.

3.1.31 Multiple level securities with password protection, facilities to lock executables to prevent unauthorized modification. It shall be possible to track operator actions.

3.1.32 Interactive online configuration facility to optimize control strategy and modify I/O or reports/alarms without interrupting process or losing valuable data. Built in-signal conditioning including scaling, conversion to engineering units, filtering etc., statistical process control on historical data with tabular, graphical reporting. Recipe management for batch parameter setting. Supervisory control. PID control blocks, sequencing, timers, on/off control, mathematical and Boolean functions. OLE automation preferably with OPC standards using COM/ActiveX.

3.1.33 License requirements:

a. Development license for total tag count of 60000(or more)—1 No.
b. Run time licenses for total tag count of 60000 (or more) --- per Operator station
c. Communication capability for HMI application and devices with visibility shall have a minimum of the following protocols.
d. IEC 61850
e. IEC 60870-5-101
f. IEC 60870-5-103
g. IEC 60870-5-104
h. OPC UA
i. Modbus TCP/IP
j. Modbus RTU
k. Profinet
l. Profibus

3.2 HMI SCREEN FEATURES

3.2.1 MINIMUM HMI SCREEN FEATURES

The following shall be the minimum of HMI application screens.

3.2.1.1 Each HMI application screen shall have three level as described below.

3.2.1.2 Level one (1) screen shall consist of plant overview screen, which must have alarm list button, reports button, historical trend button, print button, alarm silence button, external memory save button.

3.2.1.3 Level two (2) screens shall consist common display screens buttons and genset processes screen buttons.

3.2.1.4 Level three (3) screens shall consist of object screens which must have the tag name, description, trend of process value, alarm limits, shutdown limits, a note pad, trend button and close button.

3.2.2 Minimum features of faceplates:

3.2.2.1 Digital faceplates;

3.2.2.1.1 This shall be a pop-up window of digital display consisting of associated alarm tags.

3.2.2.1.2 Alarm tags shall consist of a plant code and the description. The text color of the alarm tags on normal status shall be grey but turns red when alarm is active.

3.2.2.1.3 The popup window shall have a notepad button and a close button.

3.2.2.2 Analog faceplates

3.2.2.2.1 This shall be a pop-up window of analog display that contains information about the selected measurement which includes;

a. plant code.
b. description text.
c. real-time updating trend with the time span of one minute, displaying the measured value in black and the alarm limit in red.
d. the current measurement value, which is displayed in red if the alarm limit has been exceeded.
e. additional alarms, normally grey colored, red if an alarm is active.
f. alarm and shutdown limits, numerically presented.
g. today's report values, the average, minimum and maximum values, starting from current day, 00:00:00.

3.2.2.2.2 The popup window shall have a notepad button, trend button and a close button.

3.2.2.3 PID Type I Faceplate

3.2.2.3.1 The faceplate shall contain;

a. Tag name and description
b. Analog display for process value PV, set point SP, controller value CV, min and max values for CV and SP form PLC.
c. Sensor fault alarm tag.
d. Trend window of the PV, SP and CV
e. Bar graphs for PV, SP and CV.
f. Selection buttons for PLC setpoint, HMI SP, dynamics, a note pad, trend button and close button.

3.2.2.4 PID Type II Faceplate

3.2.2.4.1 The faceplate shall contain;

a. Tag name and description
b. Analog display for process value PV, controller value CV and min and max values for CV.
c. Sensor fault alarm tag.
d. Graph window of the PV and CV
e. Selection buttons for PLC setpoint, HMI SP, a note pad and close button.

3.2.2.5 Switching device Object Type I Faceplate (Medium and Low voltage switching devices)

3.2.2.5.1 The faceplate shall contain;

a. The tag and description
b. Circuit breaker object with operation status (open/close/unknown) and color mimic.
c. Earthing switch object with operation status (connected/disconnected/ unknown).
d. Alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronization status.
e. Selection buttons for a note pad and close button.

3.2.2.6 Switching device Object Type II Faceplate (High voltage switching devices)

3.2.2.6.1 The faceplate shall contain;

a. Switching device type information
b. Object ID which shall include the station, bay and device.
c. Open Command button
d. Close Command button
e. More Sub functionalities button
f. Cancel button
g. Help button

3.2.2.6.2 All operations (open or close commands) from the main control dialog shall prompt a control confirmation dialog box requesting for confirmation of the command execution i.e. two step control operation. For example; Clicking the open command button for the Circuit Breaker shall prompt the operator to another dialog box to confirm their selection of the open command.

3.2.2.6.3 The Confirmation dialog box shall contain:

a. The execute button.
b. The cancel button.

3.2.2.6.4 The confirmation dialog shall remain active for sixty (60) seconds to allow the operator to confirm the operation. If no execution command is given within the time limit the operation shall be automatically terminated and an alert message displayed on the dialog.

3.2.2.6.5 The more button shall lead to the following functionalities:

3.2.2.6.6 Alarm state dialog:

The alarm dialog shall present all persisting and fleeting alarms for the switching device, and the unacknowledged alarms can be acknowledged.

3.2.2.6.7 Blocking Dialog:

The switching device blockings dialog shall be used for blockings within the selected switching device object in the GIS HMI database. Blocking shall include:

a. Control blocking
b. Alarm Blocking
c. Update/position indication blocking
d. Event Blocking
e. Print out blocking

3.2.2.6.8 Forced operation dialog

3.2.2.6.8.1 The Forced operation dialog shall enable controls to both operation directions regardless of the switching device state indication.

3.2.2.6.8.2 Operations shall be made, if the authorization level of the operator is Control (1) or higher and the switching device state allows controls.

3.2.2.6.8.3 If operations shall be made, the buttons 'Force Switch Open' and 'Force Switch Closed' shall be active.

3.2.2.6.8.4 In addition to this, the operations shall be possible even if:

a. The switching device is already under command
b. The switching device is selected on another monitor.
c. The switching device is interlocked.
d. The switching device interlocking objects are not sampled
e. The switching device indication object(s) is not sampled
f. The bay local/remote-switch is in Local state
g. The bay local/remote-switch is not sampled
h. The bay interlocking objects are not sampled
i. The auxiliary plug is disconnected (breaker only)
j. The other section of the 3-state switch is not open/free (3-state switch only)

3.2.2.6.8.5 Operations shall be prevented if:

a. The switching device is not motorized
b. The switching device is control blocked

c. The switching device is externally control blocked
d. The switching device process objects are not in correct switch states (discrepancy
e. in indication or command objects)
f. Station local/remote-switch is not sampled or does not allow controls.
g. The control authority for the station is not given for this application
h. The personal authority level of the user is View (0)
i. No database objects for commands

3.2.2.6.8.6 Depending on the used control method, the selection 'Force Switch Open' or 'Force Switch Close' shall either be sent to the control unit or just used as an internal tag.

3.2.2.6.8.7 Before the operation is carried out, the user shall verify the operation in the Control Confirmation Dialog.

3.2.2.6.8.8 If the switching device objects are not connected to the process, the dialog shall simulate the actual operation within the database. The Forced operation dialog box shall contain:

a. The forced open button.
b. The forced close button.
c. The Cancel button.
d. The Help button.

3.2.2.6.9 Normal state settings dialog:

3.2.2.6.9.1 The normal state dialog shall be used to define the alarm states of the selected object.

3.2.2.6.9.2 The value of the normal state shall be checked at system start-up. If the position indication at startup is not equal to the normal state, an alarm shall be activated. If a normal state is not defined, no alarm is activated at start-up regardless of the object state.

3.2.2.6.10 Operation counter dialog

3.2.2.6.10.1 The operation counter shall count the number of switching device state changes. The counter shall be increased with one every time the switching device shall be closed or earthed (which means that the position indication object in the GIS HMI database gets value 1).

3.2.2.6.10.2 In case of a three-state switch, there shall be a separate counter for both switch sections (disconnector and earth switch).

3.2.2.6.10.3 Operation Counter selection shall be user defined through a selection check box.

3.2.2.7 Object messages dialog

3.2.2.7.1 The object message dialog shall show information messages active at the moment the dialog is opened. The most important active message shall also be shown on information bar in the main dialog.

3.2.3 COLOR DEFINITIONS

3.2.3.1 Colours shall be used in the HMI to identify new alarms as well as describe different parts of the system in order to make monitoring of the plant as easy as possible. The contractor shall integrate the existing HMI colour codes in his design as follows;

3.2.3.2 Objects

Color	**State**
Green	Running, on, open, active
White	Not running, off, closed, inactive
Light Grey	No information
Red	Alarm

3.2.3.3 Alarm list, Event list, Archive list

Color	**State**
Red	Unacknowledged alarm

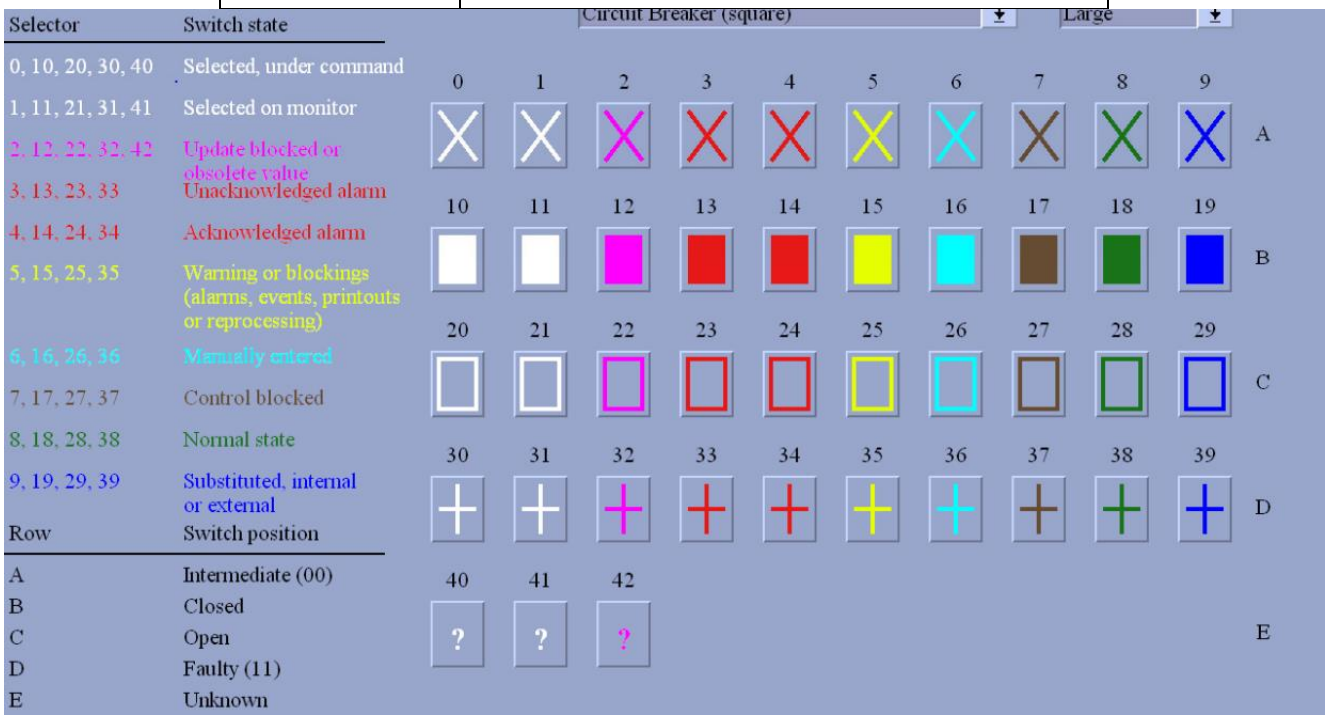
Dark red (Violet)	Acknowledged alarm, Not returned to normal
Blue	Unacknowledged, returned to normal
Green	Event

3.2.3.4 Process

Color	**State**
Brown	Fuel oil
Yellow	Gas
Blue	Air
Yellow	Exhaust Gas
Dark Green	LT Water
Light Green	HT Water
Brown	Lube oil
Black	Electrical connection
Dark Grey	Steam

3.2.3.5 GIS HMI colour

Color	**State**
Green	Normal
Cyan	Manually entered
Yellow	Warning, Blocked
Brown	Control Blocked
Red	Acknowledged Alarm, Unacknowledged Alarm
Magenta	Not updated, Obsolete value
Dark Blue	Substituted
White	Selected



3.3 COMMON SYSTEMS

The common systems screens shall comprise of the following; Electrical system HV, Electrical system MV, Electrical system LV, Fuel oil system, Fuel oil feeder, Water supply system, Oily water system, starting air system, heat recovery system, Emission monitoring system, Automation system I and

automation system 2.

3.3.1 ELECTRICAL HV SYSTEMS (GIS)

3.3.1.1 GIS HMI Screens shall include a total of three (3) screens namely; System Overview, Kipevu III station and Kipevu I Station.

3.3.1.2 The integrated GIS HMI screens shall be able to control all the ten (10) HV Bays remotely.

3.3.1.3 System Overview Screen

3.3.1.3.1 The system overview mimic shall show the communication status of system devices connected to GIS HMI which shall include the following as a minimum:

a) Substation controller, ABB RTU560
b) GIS HMI Gateway
c) Intelligent electronic devices-RED615, RET615, REF545, REB670.
d) Digital multimeters, Integra1630.
e) Network control center, KPLC SCADA
f) Uninterruptible power supplies (UPS1, UPS2)

3.3.1.3.2 The system overview shall also show this information:

a) AC/DC Panels Alarm tab displaying the following alarms:
   1. 110 VDC system zero voltage alarm
   2. 110 vdc panel common alarm
   3. 400/230 VDC panel common alarm
   4. 132 KV energy metering panel common alarm
b) RTU alarm tab
   1. #16 Atleast one indication faulty
   2. #17 Atleast one analog value faulty
   3. #19 At least one pulse counter faulty
   4. #20 At least one digital output faulty
   5. #23 RTU is faulty
   6. #25 RTU not synchronized
   7. #59 power supply failure in RTU central subrack
   8. #64 1. Cmd Supervision circuit disconnected or faulty
c) UPS alarm tab
   1. Inverter AC over voltage
   2. Inverter AC under voltage
   3. Inverter under or over frequency
   4. Bypass AC over voltage
   5. Bypass AC under or over frequency
   6. Input AC over voltage
   7. Input AC under voltage
   8. Input under or over frequency
   9. Output AC over voltage
   10. Output AC under voltage
   11. Output under or over frequency
   12. Charger over temperature
   13. Inverter over temperature
   14. Output overload
   15. Rectifier input overcurrent
   16. Inverter output over current
   17. DC link over voltage
   18. DC link under voltage
   19. Rectifier failed
   20. Inverter fault
   21. Battery contactor fail
   22. Bypass breaker fail

23. Charger failure
24. Battery current limit
25. Shutdown imminent
26. Battery low
27. Utility fail
28. Utility not present
29. Battery DC overvoltage
30. Power supply failure
31. Rectifier breaker open
32. Battery contactor open
33. Loss of redundancy
34. UPS on battery
35. UPS on bypass
36. Low battery shutdown
37. Bypass failure
38. Battery test failed
39. Fuse failure
40. Site wiring fault
41. Transformer over temperature
42. Ambient under temperature
43. Ambient over temperature
44. Unable to charge batteries

d) Supervision Function Dialog
    1. Object label
    2. More button
    3. Close button
    4. Help button

e) Communication Status:
    The system overview shall indicate whether the device communicates with the new HMI DCS via its communication bus.
    Red – Failure Status
    Green Normal Status

3.3.1.4 Kipevu III Station Screen

3.3.1.4.1 The Kipevu III Station mimic screen shall contain mimics for eight (8) Bays. The eight (8) Bays shall include;

a) Transformer Bays (E01, E03, E05):

i. Objects

1. Three (3) disconnector switches Q1, Q2 and Q4.
2. One (1) Circuit breaker Q0.
3. Three (3) Earth Switches Q51, Q52 and Q8.
4. One (1) Current Transformer
5. One (1) Voltage Transformer
6. One (1) 11/132kV Power Transformer
7. One (1) 11/132kV Power Transformer Alarm Tab
8. One (1) Circuit Breaker (Q0) Alarm Tab
9. 11/132kV Power Transformer Tap changer control tab, UP and DOWN.

ii. M**easurements**

1. Bay Load Current, 0- XXX A
2. Bay Load Active Power, 0- XXX MW
3. Bay Load Reactive Power, 0- XXX MVar
4. Bay Load Power Factor, -1 to +1 Cos fi
5. Bay Voltage, 0- 150kV

6. Bay Frequency, 0-55Hz
7. One (1) 11/132kV Power Transformer Winding HV temperature, 0- 150 0C
8. One (1) 11/132kV Power Transformer Winding MV temperature, 0- 150 0C

iii. Indication

1. 11/132kV Power Transformer Tap changer position indication.
2. Bay Mode Indication, Local/Remote

b) Bus Coupler Bay (E04):

i. Objects

1. Two (2) disconnector switches Q1 and Q2
2. One (1) Circuit breaker Q0.
3. Two (2) Earth Switches Q51 and Q52
4. One (1) Circuit Breaker (Q0) Alarm Tab

ii. Measurements

1. Bay Load Current, 0- XXX A

iii. Indication

1. Bay Mode Indication, Local/**Remote**

c) Feeder Bays (E02, E06):

i. Objects

1. Three (3) disconnector switches Q1, Q2 and Q9.
2. One (1) Circuit breaker Q0.
3. Four (4) Earth Switches Q51, Q52, Q53 and Q8.
4. One (1) Current Transformer
5. One (1) Voltage Transformer
6. One (1) Circuit Breaker (Q0) Alarm Tab

ii. Measurements

1. Bay Load Current, 0- XXX A
2. Bay Load Active Power, 0- XXX MW
3. Bay Load Reactive Power, 0- XXX MVar
4. Bay Load Power Factor, -1 to +1 Cos fi
5. Bay Voltage, 0- 150kV
6. Bay Frequency, 0-55Hz

iii. Indication

1. Bay Mode Indication, Local/Remote

d) Spare Bays (E07, E08):

i. Objects

1. Two (2) disconnector switches Q1 and Q2
2. One (1) Circuit breaker Q0.
3. Three (3) Earth Switches Q51, Q52 and Q8.
4. One (1) Current Transformer
5. One (1) Voltage Transformer
6. One (1) Circuit Breaker (Q0) Alarm Tab

ii. Measurements

1. Bay Load Current, 0- XXX A
2. Bay Load Active Power, 0- XXX MW
3. Bay Load Reactive Power, 0- XXX MVar
4. Bay Load Power Factor, -1 to +1 Cos fi

5. Bay Voltage, 0- 150kV
6. Bay Frequency, 0-55Hz

iii. Indication

1. Bay Mode Indication, Local/Remote

e) 132kV Buses (Bus 1, Bus 2):

i. Objects

1. Two (2) Earth Switches Q15 and Q25
2. Two (2) Voltage Transformers (One (1) per Bus)
3. One (1) Bus Alarm Tab

ii. Measurements

1. Bay Voltage, 0- 150kV
2. Bay Frequency, 0-55Hz

3.3.1.5 Kipevu I Station

3.3.1.5.1 The Kipevu I Station mimic screen shall contain mimics for two (2) Bays.

3.3.1.5.2 All Bays shall have a Bay local/remote indication whose status shall be a combination of the selector switch in the GIS Local control panel and soft switch in the bay controller unit REF545.

3.3.1.5.3 The two (2) Bays shall include;

a) Feeder Bays (E12, E13):

i. Objects

1. Three (3) disconnector switches Q1, Q2 and Q9.
2. One (1) Circuit breaker Q0.
3. One (1) Earth Switches Q8.
4. One (1) Current Transformer
5. One (1) Voltage Transformer
6. One (1) Circuit Breaker (Q0) Alarm Tab

ii. Measurements

7. Bay Load Current, 0- XXX A
8. Bay Load Active Power, 0- XXX MW
9. Bay Load Reactive Power, 0- XXX MVar
10. Bay Load Power Factor, -1 to +1 Cos fi
11. Bay Voltage, 0- 150kV
12. Bay Frequency, 0-55Hz

iii. Indication

1. Bay Mode Indication, Local/**Remote**

3.3.2 ELECTRICAL MV SYSTEMS

Electrical System MV screen shall contain the following;

3.3.2.1 MV Single line diagram with seven (7) generator and associated circuit breakers, two (2) bus coupler circuit breakers, three (3) power transformers with associated circuit breakers, three station transformers with associated circuit breakers and eleven (11) protection relays.

3.3.2.2 Plant Kilowatt control button for the pop-up Plant Kilowatt faceplate. The faceplate shall contain description, indication for Plant Kilowatt mode activated and deactivated, and input/output analog MW setpoint, MW capacity, MW maximum allowed and close button.

3.3.2.3 Synchronizer status indication auto position and on Generator Shedding enable button and status indication.

3.3.2.4 Soft Energizing selection key switch on position indication and soft energizing active status indication.

3.3.2.5 Bay BAO901 control mode which shall have status indication for isochronous control mode and VDC control mode and control mode buttons for face plate pop-up. The faceplate shall contain description (busbar A), Isochronous control mode status indication and two buttons for Enable and disable of the isochronous control mode, VDC control mode status indication and two buttons for Enable and disable of the VDC control mode.

3.3.2.6 Bay BAO902 control mode control mode which shall have status indication for isochronous control mode and VDC control mode and control mode buttons for face plate pop-up. The faceplate shall contain description (busbar B), Isochronous control mode status indication and two buttons for Enable and disable of the isochronous control mode, VDC control mode status indication and two buttons for Enable and disable of the VDC control mode.

3.3.2.7 Bay BAO903 control mode control mode which shall have status indication for isochronous control mode and VDC control mode and control mode buttons for face plate pop-up. The faceplate shall contain description (busbar C), Isochronous control mode status indication and two buttons for Enable and disable of the isochronous control mode, VDC control mode status indication and two buttons for Enable and disable of the VDC control mode.

3.3.2.8 Busbar A BAM901 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output display for frequency and three (3) line voltage and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.9 Busbar B BAM902 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output display for frequency and three (3) line voltage and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.10 Busbar C BAM903 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output display for frequency and three (3) line voltage and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.11 Bay BAO901 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.12 Bay BAO902 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.13 Bay BAO903 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.14 Bay BAA901 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.15 Bay BAA902 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.16 Bay BAA903 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.17 Bus coupler BAB901 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.18 Bus coupler BAB902 protection relay face plate pop-up button. The faceplate shall contain bay description, analog output for three (3) phase current and protection relay possible alarms with active alarm highlighted in red color.

3.3.2.19 Circuit Breaker BAO901object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status (connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.20 Circuit Breaker BAO902 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.21 Circuit Breaker BAO903 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.22 Circuit Breaker BAB901 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown) and alarm list for breaker position error, truck position error, position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.23 Circuit Breaker BAB902 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown) and alarm list for breaker position error, truck position error, position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.24 Circuit Breaker BAE011 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.25 Circuit Breaker BAE021 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.26 Circuit Breaker BAE031 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.27 Circuit Breaker BAE041 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.28 Circuit Breaker BAE051 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.29 Circuit Breaker BAE061 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.30 Circuit Breaker BAE071 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, circuit breaker operation status (open/close/unknown), earthing switch operation status(connected/disconnected/ unknown) and alarm list for breaker position error, truck position error, earthing switch position error, SF6 pressure low, MCB/relay fault and synchronisation status.

3.3.2.31 Generator star point earthing switch BAN011 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.32 Generator star point earthing switch BAN021 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.33 Generator star point earthing switch BAN031 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.34 Generator star point earthing switch BAN041 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.35 Generator star point earthing switch BAN051 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.36 Generator star point earthing switch BAN061 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.37 Generator star point earthing switch BAN071 object with a pop-up circuit breaker faceplate. The faceplate shall contain the description, object status disconnector position error alarm highlighted in red for the active alarm.

3.3.2.38 Three (3) face plate pop-up buttons for generator MW, MVAr and pf shall be configured for each generator. The faceplate shall have description, trend, alarm limits and shutdown limits. Provision for entering Mw and pf setpoint for each engine shall be configured.

3.3.3 ELECTRICAL SYSTEM LV

Electrical System LV screen shall contain the following;

3.3.3.1 LV Single line diagram with three(3) station transformer and associated circuit breakers, one (1) back-up feeder from kipevu 1 and associated circuit breaker, one(1) black start generator and associated circuit breaker, three bus-tie circuit breakers and four (4) power monitoring unit faceplates buttons and analog display for Kw, KVAr,pf.

3.3.3.2 The four (4) power monitoring units shall be configured to associate with the three station transformers and one back-up feeder from Kipevu 1.

3.3.3.3 Each of the four power monitoring unit faceplate shall display, analog active power, reactive power, power factor, frequency, phase current for L1, L2 &L3 lines, main line voltage for U12, U23 & U31, active energy export, active energy import, reactive energy export, reactive energy import.

3.3.3.4 Pop-ups digital faceplate for alarms shall also be created for the following equipment connected to the LV busbar:

a. Switchgear
b. DC units: BEY901, BEY902, BEY903
c. Control Panels: BLM 901, BLQ901, BLQ902, BLQ903, BLQ904
d. UPS units: BEU905

3.3.4 FUEL OIL SYSTEM

3.3.4.1 Fuel Oil System (HFO and LFO) screen shall contain the following;

3.3.4.2 Piping and instrumentation diagram of the system consisting of storage tanks, transfer pumps, separator unit, flowmeters. Refer to Appendix XXXX.

3.3.4.3 The system will have flowmeters for HFO mass flow rate after customer pipeline, HFO mass flow rate after transfer pump units and LFO mass flow rate after customer pipeline.

3.3.4.4 The system shall have an objects for HFO fuel storage tank PAB 901, LFO fuel storage tank PAE 901 and HFO daytank PBC 901. The objects shall have analog output display faceplates for Temperature in degree celcius, level in percentage and digital faceplates for high- and low-level

alarms. The objects faceplates must have the tag name, description, trend window of process value, alarm limits, shutdown limits, a note pad, trend button and close button.

3.3.4.5 HFO separator units should contain objects for three separator and associated motors, heaters and pipework with mimics for status.

3.3.4.6 Pop-ups digital faceplate for alarms shall be created for Control panel BJJ901, BJJ902, BJJ903, BJF901 .

3.3.4.7 Fuel Oil Feeder screen shall contain the following;

3.3.4.8 Piping and instrumentation diagram for LFO feeder pumps unit PBF 902, HFO feeder unit PCA901, flow meters, HFO Autofilters and viscosity PID controller.

3.3.4.9 The HFO and LFO feeder objects shall contain pop up digital alarm faceplate for each of the pumps, PID pressure controls, HFO viscosity control PID, control buttons for Re-start and reset.

3.3.4.10 HFO and LFO PID pressure control faceplates shall contain tag name, description, trend window of process value, set point from PLC, controller CV, Process Value PV setpoint, bar graphs for PV, SP and CV. Buttons for PLC setpoint, dynamics, HMI SP, alarm limits, a note pad, trend button and close button.

3.3.4.11 A minimum of four (4) alarm tags shall be configured and linked to each of the HFO and LFO feeder pump objects with the active alarm highlighted in Red colour. Run-green, stop-grey, tripped-red and remote-control mode selection indication mimic display shall be configured.

3.3.4.12 A minimum of two (2) alarm tags shall be configured and linked to HFO Autofilter object shall k with the active alarm highlighted in Red colour.

3.3.4.13 Viscosity meter faceplates must have the tag name, description, trend window of process value, alarm limits, shutdown limits, a note pad, pop up button for viscosity control, trend button and close button.

3.3.4.14 Pop up button for viscosity control face plate shall consist of tag name, description, HFO Viscosity control set-point, Manual HFO Viscosity at 50C, Snap HFO viscosity at 50C, Virtual HFO viscosity at 50C, Manual viscosity control, Auto tracking Snapshot.

3.3.4.15 Pump motor VFD control feedback faceplate shall consist of tag name, description, trend window of process value, alarm limits, shutdown limits, a note pad, trend button and close button.

3.3.4.16 HFO line pressure transmitters and temperature faceplates before and after the auto filters shall consist of tag name, description, trend window of process value, alarm limits, shutdown limits, a note pad, trend button and close button.

3.3.4.17 Analog display for LFO line pressure and HFO transmitters and temperature display faceplates shall consist of tag name, description, trend window of process value, alarm limits, shutdown limits, a note pad, trend button and close button.

3.3.4.18 Pop-ups digital faceplate for alarms shall be created for Control panel BJL901, BJL902.

3.3.5 WATER SUPPLY SYSTEM

3.3.5.1 Water supply system shall consist of the following:

3.3.5.2 Piping and instrumentation diagram of the system consisting of raw water storage tank VFB901, treated water tank VBC901 and water treatment unit VBD901. The water treatment unit VBB901 shall consist of objects for three (3) booster pumps unit(VBD901, VBC901 &VBD903). The water treatment shall have a digitat pop-up faceplate for common alarm. Refer to Appendix XXXX.

3.3.5.3 The tanks objects (VFB901 & VBC901) shall have analog display faceplate for level indication and trending.

3.3.5.4 Oily Water Treatment system shall consist of the following:

3.3.5.5 Piping and instrumentation diagram of the system consisting of three (3) sump tanks with a high level alarm switch face plate, two (2) oily water buffer tanks tanks with analog faceplate for level indication, one (1) sludge tank with analog faceplate for level indication, a sludge mass flowmeter faceplate with four(4) analog display face plates for temp, density, flow rate and mass totalizer (with a reset button), a boiler washing water tank with a high level alarm switch face plate, six(6) pneumatic operated pump objects, an oily water treatment unit.

3.3.5.6 Two(2) septic pumps with a high level alarm switch face plate. The active alarm on the face plate will be highlighted red when a high level alarm is activated.

3.3.5.7 Six (6) pneumatic operated pump objects status shall be green on run mode and grey when off mode.

3.3.5.8 Fire Water system shall consist of the following:

3.3.5.9 Piping and instrumentation diagram of the system consisting of fire water tank with analog faceplate for level indication, fire water pump container consisting of three (3) fire pump objects (electrical pump, diesel pump and jockey pump)whose status shall be green on run mode,grey when off mode and red for an active fault and a fire water distribution piping and instrumentation diagram.

3.3.6 STARTING AIR SYSTEM

3.3.6.1 Starting Air system screen shall consist of the following:

3.3.6.2 Piping and instrumentation diagram of the system consisting of two(2) instrument air units, one(1) starting air units with three(3) compressors, four(4) air bottles ,7 engine set objects and one(1) compressor room ventilation.

3.3.6.3 Motor status shall be configured for each of the five (5) compressors indicating white when off mode, green when running mode and red when tripped. A digital alarm face plate shall be configured for each compressor.

3.3.6.4 Pop-up digital face plates for common alarms shall be configured for the control panels (BLQ906, BLB901, BLB902, BLA901). Two (2) pressure alarms face plates shall be configured for the two(2) instrument air units.

3.3.6.5 An analog display and face plate shall be configured for pressure values of starting air and control air for each of the seven (7) engine set objects.

3.3.7 HEAT RECOVERY SYSTEM

3.3.7.1 Heat Recovery system screen shall consist of the following:

3.3.7.2 Piping and instrumentation diagram of the system consisting of three(3) exhaust gas boilers, 1(one) feed water pump unit, one(1) auxiliary boiler and one(1)auxiliary container fan.

3.3.7.3 A digital face plate shall be configured for pressure high alarm for three(3) exhaust gas boiler, one (1) auxiliary boiler and a low low feed water tank level. Pop-up digital face plates for common alarm shall be configured for the control panel(RCE901).

3.3.7.4 An analog display and face plate shall be configured for pressure values of the steam header.

3.3.8 EMISSION MONITORING SYSTEM

3.3.8.1 Emission Monitoring system screen shall consist of the following:

3.3.8.2 Piping and instrumentation diagram of the system consisting of two (2) emission measuring objects(YMC901 and YMC902), process sequence for the seven(7) genset and one stack.

3.3.8.3 Three (3) analog display and face plates for oxygen, sulphur dioxide and variety of nitrogen oxides. a process sequence mimic and two buttons for enable and disable for each of the seven (7) engines.

3.3.8.4 The emission measuring objects (YMC901 and YMC902) shall have three (3) I/O analog display for timer setting (sample replace, measure stabilizer, measuring),digital face plates comprising a minimum of 12 alarms, an alarm reset button, a process mimic for auto-zeroing, a face plate for measuring head with a minimum of two(2) alarms and a pop-up digital common alarm face plate for control panels (BLO901 and BLO 902).

3.3.9 AUTOMATION SYSTEM

3.3.9.1 Automation system 1 of 2 screen shall consist of the following:

3.3.9.2 Communication network architecture showing Operator workstations, IEDs,PLCs and associated remote I/Os, Communication nodes for the common panels and engines 1,2,3 and 4.

3.3.9.3 Communication network architecture for one engine shall be modified to suit the new architecture approved by the client.

3.3.9.4 A face plate shall be configured for each of the following:

1. Power supply card; with a minimum of 3 configurable alarm tags.
2. CPU Card; with a minimum of 3 configurable alarm tags.
3. Communication Card; with a minimum of 3 configurable alarm tags.
4. Digital I/O Card; showing status for each channel and a watch-dog alarm tag.
5. Analog I/O Card; showing status for a watch-dog alarm tag.
6. IEDs; showing status of each IED communication failure alarm.
7. GIS data gateway showing status of communication failure alarm.

3.3.9.5 Automation system 2 of 2 screen shall consist of the following:
Communication network architecture showing IEDs, PLCs and associated remote I/Os, Communication nodes for engines 5,6 and 7.

3.3.9.6 A face plate shall be configured for each of the following:

1. Power supply card; with a minimum of 3 configurable alarm tags.
2. CPU Card; with a minimum of 3 configurable alarm tags.
3. Communication Card; with a minimum of 3 configurable alarm tags.
4. Digital I/O Card; showing status for each channel and a watch-dog alarm tag.
5. Analog I/O Card; showing status for a watch-dog alarm tag.
6. IEDs; showing status of each IED communication failure alarm.

3.4 THE GENSET SYSTEM

3.4.1.1 The genset system screen shall comprise of:

3.4.1.2 Common system selection button, genset number selection buttons (1,2,3,4,5,6&7) and individual engine process screen selections buttons , for temperature , control , Fuel , Lube oil , Cooling , Exhaust gas , and Exhaust gas bar graph .

3.4.1.3 Common system selection button shall be configured to link to common system screen.

3.4.1.4 The genset number selection button shall be configured to link to individual genset system screens namely temperature, control, fuel, lube oil, cooling, exh. Gas, Bar graphs exh. Gas.

3.4.1.5 Temperature screen shall consist of genset object with;

Analog output display and associated pop-up face plates for temperature (78 tags), speed (3tags), power (3tags) actuator position (1tag) torsional vibration (1tag).

3.4.1.6 Digital status display and faceplates for:

1. Engine speed configured with a minimum of four (4) alarm tags.
2. Turning gear configured with a minimum of one (1) alarm tag.
3. Emergency stop configured with a minimum of five (5) alarm tags.
4. Emergency stop safety relay configured with a minimum of two (2) alarm tags.
5. Torsional vibration monitoring configured with a minimum of one (1) alarm tag.

3.4.1.7 Control screen shall consist of;

1. Genset starting condition interlocks with status indication for a minimum of 18 tags.
2. start/stop sequence mimic with command buttons for Start order, Stop order and shutdown reset, analog output display with associated faceplate for engine speed and actuator reference.

3.4.1.8 Generator measurements shall consist of;

1. Bar graphs for active power, reactive power, current and voltage.
2. Analog output display with associated faceplate for maximum available MW, generator active power MW, generator power factor, generator

reactive power, three phase currents, three-line voltages, generator frequency, three analog display for active energy generated, reactive energy imported and reactive energy exported.

3. Two setpoint command buttons for active and reactive power.
4. Automatic derating digital output faceplate configured with a minimum of five alarm tags.

3.4.1.9 Generator MV SLD mimic with digital status indications with associated face plates for generator circuit breaker, earth switch, generator star point earthing switch. Three status indication for parallel with the grid, AVR excitation and voltage supervision. A button for breaker trip reset.

3.4.1.10 Generator operation modes mimic with selected mode status indication.

3.4.1.11 Generator multifunction protection relay object with alarm status and associated face plate configured with a minimum of nineteen alarm tags.

3.4.1.12 Generator differential current protection relay object with alarm status and associated face plate configured with a minimum of four alarm tags.

3.4.1.13 Genset miscellaneous alarms with status indication configured for a minimum of 12 tags.

3.4.1.14 Fuel System screen shall consist of;

3.4.1.15 Piping and instrumentation diagram of the system consisting of objects for mixing tank, booster pump module, autofilter, engine, clean leak and dirty leak tanks.

3.4.1.16 Digital status displays and faceplates shall be configured for:

1. Two (2) Fuel leak off with a minimum of two (2) alarm tags.
2. Two Control panel for BJA and BJL configured for a minimum of four (4) and one (1) alarm tags respectively.
3. Fuel filter differential pressure configured for a minimum of one (1) alarm tags.
4. Motor status for each of the four (4) pumps indicating white when OFF, green when RUNNING, red when TRIPPED and a minimum of two (2) alarm tags for each pump.
5. Level control high and low for clean leak, dirty leak and mixing tanks.
6. Mixing tank de-airing alarm, dirty leak common alarm, fuel valve position alarm and fuel heater shutoff alarm.
7. fuel selection buttons (2) - HFO/LFO.
8. Digital trace heating mode indicator.

3.4.1.17 An analog display and face plate shall be configured for temperatures (6), flowmeter (flow rate,total mass, reset button, pre-reset button) and fuel inlet pressure.

3.4.1.18 Fuel oil temperature and viscosity PID control faceplates shall contain tag name, description, trend window of process value, set point from PLC, controller CV, Process Value PV setpoint, bar graphs for PV, SP and CV. Buttons for PLC setpoint, dynamics, HMI SP, alarm limits, a note pad, trend button and close button.

3.4.1.19 An analog faceplate with a minimum of eight(8) analog sub-faceplate pop ups for booster control references.

3.4.1.20 A bar graph for LFO and HFO level indications.

3.4.1.21 Lube Oil System screen shall consist of;

3.4.1.22 Piping and instrumentation diagram of the system consisting of objects for lube oil separator, engine, (3) lube oil pump units, service tank, new lube oil tank and used lube oil tank.

3.4.1.23 Digital status displays and faceplates shall be configured for:

1. Motor status for each of the seven (7) pumps indicating white when OFF, green when RUNNING and red when TRIPPED.
2. Four (4) Control panel for BJN, BJP901, BJP902 and BJP903 configured for a minimum one (1) alarm tag.
3. One (1) Control panel for BJA configured for a minimum four (4) alarm tags.
4. Auto-filter differential pressure configured for a minimum of two (2) alarm tags.
5. Oil mist configured for a minimum of four (4) alarm tags.

6. Engine inlet low pressure alarm tag.

3.4.1.24 An analog display and face plates shall be configured for temperatures (5), pressure (3), flowmeters (2) (flow rate, total mass, reset button), levels (4) for Used Lube oil tank, New Lube oil tank, Service tank and Engine Sump tank.

3.4.1.25 Temperature PID control faceplate shall contain tag name, description, trend window of process value, set point from PLC, controller CV, Process Value PV setpoint, bar graphs for PV, SP and CV. Buttons for PLC setpoint, dynamics, HMI SP, alarm limits, a note pad, trend button and close button.

3.4.1.26 Cooling System screen shall consist of;

1. Piping and instrumentation diagram of the system consisting of objects for Engine, Inlet ventilation, Outlet ventilation, Auxiliary ventilation, Radiators, Expansion vessel, Control valves, Charge air coolers, Lube-oil cooler and Preheating system (pump and steam heater).
2. Digital status displays configured for two engine driven pumps and two turbo-chargers indicating white when OFF and green when RUNNING.
3. Digital status displays configured for two motors indicating white when OFF, green when RUNNING and red when TRIPPED.
4. Digital status displays configured for two control valves position indication.
5. Digital status displays and faceplates configured for:
6. Four (4) Variable Frequency Drives with a minimum of three (3) alarm tags.
7. One (1) Control panel BLP with a minimum of one (1) alarm tag.
8. Expansion vessel level alarm.
9. A radiator heating mode selection button with an indication.

3.4.1.27 Analog displays and face plates shall be configured for motor speed (4), temperature (14), frequency (4), current (4), motor power (4), pressure (3) and relative humidity.

3.4.1.28 Temperature control PID faceplate which shall contain tag name, description, trend window of process value, set point from PLC, controller CV, Process Value PV setpoint, bar graphs for PV, SP and CV. Buttons for PLC setpoint, dynamics, HMI SP, alarm limits, a note pad, trend button and close button.

3.4.1.29 An analog faceplate with a minimum of two (2) analog sub-faceplate pop ups for Dewpoint Limiter.

3.4.1.30 Exhaust Gas System screen shall consist of;

1. Piping and instrumentation diagram of the system consisting of objects for Engine, Exhaust Stack, Exhaust Gas boiler, Emission Unit, Turbo Wash Unit and Exhaust Gas Damper
2. Digital status displays and faceplates configured for:
   a. Three (3) pressure alarm tags.
   b. Valve position feedback.
3. Analog displays and face plates configured for speed (2), temperature (10), pressure (1) and absolute humidity (1).
4. Three (3) analog display and face plates for oxygen, sulphur dioxide and variety of nitrogen oxides.
5. A turbocharger wash unit with an eight-step process sequence mimic, four down-counters for turbine and compressor washing, a reset button, setpoint input, four control buttons and a minimum of three alarm tags.
6. Digital status indicators configured for six control valves indicating white when OFF and green when RUNNING.

3.4.1.31 Exhaust Gas System Bar Graphs screen shall consist of;

1. A mimic bar graph of exhaust gas cylinder temperature and deviation for both Bank A and B and limits for alarm, load reduction and shutdown.
2. Analog displays and face plates configured for temperatures (36) speed (1) and active power (1).

3.4.1.32 Cylinder Liner Temperature Bar Graphs screen shall consist of;

1. A mimic bar graph of cylinder liner temperature and deviation for both Bank A and B, and limits for alarm, load reduction and shutdown.
2. Analog displays and face plates configured for temperatures (36) speed (1) and active power (1).

3.4.1.33 Main bearing Temperature Bar Graphs screen shall consist of;

1. A mimic bar graph of Main bearing temperatures and limits for alarm, load reduction and shutdown.
2. Analog displays and face plates configured for temperatures (11) speed (1) and active power (1).

3.4.1.34 An alarms list screen shall consist of;

1. A list of all active alarms to be displayed according to IEC 62682 standards:
2. Unacknowledged alarms.
3. Acknowledged alarms, not returned to normal.
4. Unacknowledged alarms, returned to normal.

3.4.1.35 Alarm filters shall be used to view all alarms, shutdown/trip alarms, sensor fault as well as separately browse engine related alarms engine by engine or common alarms only.

3.4.1.36 The alarms shall be acknowledged with a soft button or a keyboard shortcut.

3.4.1.37 Each alarm shall bear the following information;

1. Date of the alarm
2. Time of the alarm
3. Description of the alarm
4. Plant code
5. Alarm group
6. Alarm state

3.4.1.38 An event list screen shall consist of;

1. All present alarms, past alarms and events.
2. All changes in alarms and events state and they shall be displayed in a separate row with a time stamp.

3.4.1.39 A list of all events shall be displayed in different colors to differentiate the following;

1. Alarm activated.
2. Alarm acknowledged.
3. Alarm returned to normal, acknowledged.
4. Alarm returned to normal, not acknowledged.
5. All events other than alarms.

3.4.1.40 Alarm filters shall be used to view all alarms,shutdown/trip alarms,sensor fault as well as separately browse engine related alarms engine by engine or common alarms only.

3.4.1.41 The alarms shall be acknowledged with a soft button or a keyboard shortcut.

3.4.1.42 Each alarm shall bear the following information;

1. Date of the alarm
2. Time of the alarm
3. Description of the alarm
4. Plant code
5. Alarm group

3.4.1.43 An archive list screen shall consist of;

1. Historical list of events which shall be archived in the historian server.
2. Archive filters shall be used to view all alarms, shutdown/trip alarms, sensor fault as well as separately browse engine related alarms engine by engine or common alarms only.
3. A calendar control for selecting the desired day for viewing.

3.4.1.44 Historical trend shall consist of two screens:

1. Trend window screen which shall consist of the following:

a. Graph display with the engineering units on the Y-axis and time limits on the X-axis.
b. Historical values displayed for a minimum of ten measurements at a time.

2. Time limit setting button- Sets the time limits for the active trend.
3. Trend select group button -Opens the Historical trend select group display.
4. Save trend button - Saves the trend to removable media.
5. Archive list button - Opens an Archive list for all events that have occurred during the active time frames.
6. Toggle the chart grid on/off button.
7. Toggle the help line labels on/off button.
8. Zoom out/in button.
9. Scroll the trend button.
10. Y-axis slider button.
11. X-axis help line slider with time information button.
12. Zoom in on the time between the X-axis help lines.
13. Display the time span between the X-axis help lines. Display all events that have occurred during the time between the X axis help lines.
14. Genset selection button.

3.4.1.45 Select pen group screen shall consist of the following:

1. Pen selection for display of a minimum of ten (10) selected values with a reset button
2. Genset trend pen groups with buttons for genset selection and fourteen buttons for group of measurement tags selection. Each trend pen group shall accommodate a minimum of forty-five (45) pen selection tags.
3. Common trend pen groups with twelve buttons for group of measurement tags selection. Each trend pen group shall accommodate a minimum of forty-five (45) pen selection tags.
4. Six (6) customizable trend pen group of pen selection tags. Each group shall have a pop-up window with buttons for saving the current pen selection to this group, changing the group name, getting the trend and closing. Each trend pen group shall have a minimum of ten (10) pen selection tags.
5. Pen selections tags of the selected trend pen group shall be displayed with Plant code and Description.

3.4.1.46 Instant reports screen shall consist of Historical trend pen configuration with Reset Pen and Get-trend buttons.

3.4.1.47 It shall contain common and genset measurement tags.

a) Common measurement tags:

1. Electrical Transformer Feeder 1 with sixteen (16) tags.
2. Electrical Transformer Feeder 2 with sixteen (16) tags.
3. Electrical Transformer Feeder 3 with sixteen (16) tags.
4. Electrical HV outgoing feeder Line 1 with eighteen (18) tags.
5. Electrical HV outgoing feeder Line 2 with eighteen (18) tags.
6. Electrical HV outgoing feeder Line 3 with eighteen (18) tags.
7. Electrical HV outgoing feeder Line 4 with ten (10) tags.
8. Electrical HV outgoing bus coupler with twelve (12) tags.
9. Electrical MV outgoing feeder 1 with three (3) tags.
10. Electrical MV outgoing feeder 2 with three (3) tags.
11. Electrical MV outgoing feeder 3 with three (3) tags.
12. Electrical busbar 1 with four (4) tags.
13. Electrical busbar 2 with four (4) tags.

14. Electrical busbar 3 with four (4) tags.
15. Electrical bustie breaker 1 with three (3) tags.
16. Electrical bustie breaker 2 with three (3) tags.
17. Electrical bustie breaker 3 with three (3) tags.
18. Electrical LV feeder 1 with three (3) tags.
19. Electrical LV feeder 2 with three (3) tags.
20. Electrical LV feeder 3 with three (3) tags.
21. Electrical DC with three (3) tags.
22. Electrical LV Q1 feeder 1 with fourteen (14) tags.
23. Electrical LV Q2 feeder 2 with fourteen (14) tags.
24. Electrical LV Q3 feeder 3 with fourteen (14) tags.
25. Electrical LV Q8 feeder 8 with fourteen (14) tags.
26. Fuel oil with eighteen (18) tags.
27. HFO pressure control with twelve (12) tags.
28. LFO pressure control with twelve (12) tags.
29. HFO transfer mass flow (Micro Motion) with four (4) tags.
30. Customer HFO pipeline mass flow (Micro Motion) with four (4) tags.
31. HFO after feeder unit mass flow Q001 (Micro Motion) with four (4) tags.
32. HFO after feeder unit mass flow Q002 (Micro Motion) with four (4) tags.
33. LFO transfer mass flow (Micro Motion) with four (4) tags.
34. LFO feeder mass flow (Micro Motion) with four (4) tags.
35. Lube oil unloading mass flow (Micro Motion) with four (4) tags.
36. Sludge loading pump mass flow (Micro Motion) with four (4) tags.
37. Lube oil with three (3) tags.
38. Oily water with three (3) tags.
39. Others with six (6) tags.
40. Water supply with two (2) tags.
41. Two Emission monitoring units YMD 901 and YMD 901 each with twenty-four (24) tags.
42. Two (2) tags for each engine.
43. HFO after feeder unit mass flow Q001 with one (1) tag.
44. HFO after feeder unit mass flow Q001 with one (1) tag.

b) Genset measurement tags:

1. Electrical with seventeen (17) tags.
2. Generator with eight (8) tags.
3. Load and speed with five (5) tags.
4. Fuel with eight (8) tags.
5. Charge air and turbowasher with eight (8) tags
6. Lube oil with eleven (11) tags
7. Bearing with ten (10) tags.
8. Cooling with thirteen (13) tags.
9. Exhaust gas with twenty-three (23) tags.
10. Liners with eighteen (18) tags.
11. Start air with two (2) tags.
12. LO flowmeter (micro motion) with three (3) tags.
13. Radiator with seven (7) tags.
14. Inlet ventilation with four (4) tags.
15. Outlet ventilation two (2) tags.
16. Engine running hours one (1) tag.
17. LT-water inlet temperature control with twelve (12) tags.
18. HT-water inlet temperature control with twelve (12) tags.
19. Dewpoint limiter with three (3) tags.
20. Radiator frequency control with eight (8) tags.
21. Lube oil inlet temperature control with eleven (11) tags.

22. Fuel temperature control (compact booster) with eight (8) tags.
23. Viscosity control (compact booster) with three (3) tags.
24. Compact booster Misc. with eight (8) tags.
25. Preheating steam temperature control with eleven (11) tags.
26. Inlet air fan frequency converter control with seven (7) tags.
27. Outlet air fan frequency converter control with seven (7) tags.

3.4.1.48 Level 1 screen short-cut buttons shall consist of;

1. HAZARDOUS ALARMS button with a minimum of 20 tags all associated to fire protection system.
2. An ALARM SILENCE button.
3. A HOME button that will direct to the plant overview.
4. An ALARM LIST button
5. An INSTANT REPORT button.
6. A HISTORICAL TREND button.
7. A PRINT button that prints the active screen.
8. A SAVE button that saves the active screen.
9. A user LOG IN button.
10. Analog displays and face plates configured for temperatures (11) speed (1) and active power (1).

3.4.1.49 The contractor shall configure alarms list viewer windows for all alarms and trips.

3.4.1.50 The contractor shall configure events list viewer windows for all events in the operation and control of the seven (7) engines and associated power plant auxiliaries.

3.4.1.51 The contractor shall configure archive events viewer for all alarms with filtering capabilities

3.4.1.52 The alarm lists logs shall be capable of differentiating acknowledged, unacknowledged, active and inactive alarms through a color code identical to the Intouch 10.0 alarm color configuration.

3.4.1.53 Tag nomenclature shall be identical/similar to the existing HMI nomenclature.

3.4.1.54 Trending of historical data-analogues signals shall be available. The trending tab shall have capability for the user to select the signals to trend on one tab. The minimum number of trend-able analogue signals in a single tab shall be atleast ten (10).

3.4.1.55 Trending, alarming, alarm handling, 1 mSec SOE, historization, reporting etc. shall be as per the latest technologies available in a modern HMI applications.

3.4.1.56 The historical trends shall be retrievable at the historian server for at least ten (10) calendar years.

3.4.1.57 The starting, running and stopping of the engines from the Operator Workstation shall be as per the Engines Original Equipment Manufacturer's operation manuals.

3.5 HOST SERVERS SPECIFICATIONS

3.5.1 General requirements

3.5.1.1 A total of two (2) industrial host servers shall be supplied and installed in a 42U server cabinet.

3.5.1.2 Servers shall be assembled into the cabinet by the contractor and shall be delivered to site in a completely assembled cabinet. All devices, components and accessories required to assemble the servers into the cabinet shall be supplied by the contractor irrespective of whether they are stated in the schedules or not.

3.5.1.3 Servers offered shall be complete with all hardware components, accessories, features and devices necessary for a complete functional rack mounted server computer irrespective of whether these features have been specified in these schedules or not.

3.5.1.4 The servers supplied will be used by the client to operate Distributed control systems for a power plant

3.5.1.5 The servers shall execute PLC time-stamped communication protocol variable frames. The active server enables communication to PLC variables frames for:

3.5.1.6 Use of the high availability Ethernet LAN in order to periodically scan active redundant PLC controller at each generation unit, and also active redundant PLC for auxiliary services (COMMON PLC), obtaining time-stamped updates for analog and digital signals.

3.5.1.7 Reporting analog and digital updates from PLC System software.

3.5.1.8 Receiving command actions (set points and digital commands) and translate them into write orders for the appropriate active PLC redundant controller through the High Availability Ethernet LAN.

3.5.1.9 Active Server shall update any received value expressed in engineering units, in its RAM real-time DCS database variables. All variables can be configured inside a hot-standby redundancy association, so that any value update can also be transmitted to the redundant server through the High Availability Ethernet LAN.

3.5.1.10 Active Server updates any received value to Operator Stations through local high availability LAN.

3.5.1.11 The Servers shall also make data processing according to their configuration as highlighted below.

3.5.1.12 The Servers shall maintain detected-alarm lists that also are replicated to local Operator Stations and any acknowledgement action at any Operator Station is replicated to any redundant Process-Data server and other Operator Stations.

3.5.1.13 The Servers shall locally log historical alarm registers in proprietary format so that active server can provide historical alarm records to Local Operator Stations.

3.5.1.14 The Servers shall locally log FIFO historical variable value changes so that Operator Stations can present historical trend graphs of recorded variables from the active server.

3.5.1.15 The Servers shall perform OPC Server functions in order to provide redundant data sources for Plant Information's OPC Interface.

3.5.1.16 The offered servers shall be industrial grade designed for 24/7 operation at the following environmental conditions:

3.5.1.17 Temperature: 0 to 60°C (continuous)

3.5.1.18 Altitude: Sea level

3.5.1.19 Installation location: indoor with natural aeration only.

3.5.1.20 The Servers shall meet a minimum of the following specifications.

Number/ Quantity	Two
Server features	1 RU **Chassis** with up to 8, 2.5" Hard Drives, up to 2 PCIe Slots (With Optional Riser) **Memory Configuration** - 128 GB (8x 16 GB RDIMM, 3200MT/s, Dual Rank) 2 **CPU** - Intel® Xeon® Silver 4214R 2.4G, 12C/24T, 9.6GT/s, 16.5M Cache, Turbo, HT (100W) DDR4-2400 **Disks** - 2 X 300 GB 15 K SAS Disks Disks- 3* 1.6TB SSD SAS Mix Use 12Gbps 512e 2.5in Hot-plug AG Drive, 3 DWPD, **Raid Controller**: Eight Port Controller with 8Gb NV Cache, Minicard, Supporting

	RAID levels 0, 1, 5, 6 and RAID spans 10, 50, 60 Dual Hot Plug Redundant Power Supply, each 750W 2M PDU style power cord Trusted Platform Module 2.0 **Network**: Broadcom 5720 Quad Port 1GbE BASE-T, rNDC Font Bezel Rack rails Mounting- Rack Type Form Factor – 1U/2U **Embedded System** Management Mandatory Capabilities
Power Supply	Two (2) Hot plug, dual redundant power supply units (1+1)
Warranty	Two (2) years manufacturer warranty period on hardware. Warranty certificate required. Two (2) years warranty on solution from the supplier. Include SLA
Software	VMware Vsphere Standard for 2 CPU with 2 years support Windows Server 2019 Microsoft SQL
Certifications	Device must be tested and approved for use in the EU or USA or Canada. Proof of testing and certification MUST be provided. Product certification from an EU or USA or Canada reputable firm MUST be provided along with the bid.

3.5.2 Host Servers Operating systems Requirements

3.5.2.1 Contractor shall install all operating systems as virtual machines as detailed in the proceeding clauses. The virtual machines shall be installed, configured and tested prior to factory acceptance tests by the procuring entity.

3.5.2.2 Software licences referred in the scope of supply shall all be supplied and installed into the servers even for those not detailed in this particular specification.

3.5.2.3 The operating systems/ virtual machines shall run HMI Application softwares for operation of critical power systems. The Contractor shall ensure when configuring the servers the highest reliability of the power systems configured.

3.5.2.4 Windows software installed into the host servers shall be configured with the optimal settings and services for an industrial control system use.

3.5.2.5 Contractor shall train the procuring entity extensively on virtualization, operating systems installation and configuration, Windows server services and applications configuration and all other items as detailed in this tender.

3.5.2.6 Contractor shall fully involve the procuring entity during installation and commissioning of the server system. Contractor's personnel shall be physically present onsite with the procuring entity personnel for this exercise.

3.5.3 Host Servers Virtualization Requirements

3.5.3.1 The host server shall be a virtual machine container, to host the client's HMI application softwares and other applications. The fundamental aim of the virtualization shall be to allow back up and transfer of all server software and data to another hardware host machine in case of hardware failure with minimal or no changes to the applications.

3.5.3.2 Each server shall contain latest Enterprise VMware vSphere (ESXi) native (bare metal) Hypervisor operating system installed. The VMware hypervisor shall support all Microsoft windows operating systems from windows server 2019 to windows 8.1.

3.5.3.3 Each host server shall contain a minimum of two Virtual Machines of Standard Windows server 2019 installed on the VMware Hypervisor.

3.5.3.4 Virtual machines shall be hardware independent; i.e. in case of Hypervisor machine hardware change, the virtual machines shall have to work with the same base features, with no specialist support for the substitution.

3.5.3.5 Virtualization and installation of VM's in all the servers, setting up of the virtualization management client and the associated virtualization set up shall be carried out by the contractor.

3.5.3.6 vCenter server shall be installed to two host servers for virtual machines monitoring and management.

3.5.3.7 vMotion server shall be installed in the host servers for zero downtime migration.

3.5.3.8 Contractor shall carry out all necessary configuration and provide any required applications required for regular back up of all VM's.

3.5.4 Hypervisor Minimum Requirements

3.5.4.1 X-based operating system (Unix/Linux).

3.5.4.2 Remote control, management and configuration capability of the hardware machine and all its virtual machines without mouse, keyboard and monitor direct connections (hypervisor remote control).

3.5.4.3 NTP time synchronization client: the time synchronization shall be transferred to its own virtual machines.

3.5.4.4 Native RAID5 management capability.

3.5.4.5 All the connected network cards may be directly connected to one of its virtual machines with no virtual driver interposition ("hardware pass-through").

3.5.4.6 From the operating point of view, all the running Virtual Machines shall have to be seen as physical computers in the network, even if they are VMs.

3.5.5 Virtualisation Software Requirements

3.5.5.1 A minimum of two (2) 64-bit VMware vSphere essential plus with perpetual licenses shall be supplied and utilised to virtualise all the Host servers in scope of supply

3.5.5.2 VMware vSphere shall have a minimum of the following features and functions:

a. vSphere and associated features for two servers
b. Two (2) VCenter server essentials (one per license)
c. Hypervisor
d. vMotion
e. High availability
f. Data protection and replication
g. vShield endpoint
h. Two (2) vSphere clients (one per license)

3.5.5.3 Two (2) vCenter essentials plus (or higher) servers shall be installed into the two host servers' windows 2019 server virtual machines, for virtual environment monitoring and management. Supplier shall configure, test and commission the vCenter functions to allow a minimum following:

a. Management of VM's such as configure, provision, monitor, troubleshoot and update virtual environments.
b. Monitoring of installed VM's health.
c. Database server for virtual machine functions.
d. Perform advanced functions such as vMotion, high availability etc. supported by the license.

3.5.5.4 Two (2) year basic software VMware vSphere and all other applications support shall be provided.

3.5.5.5 Two (2) years manufacturer warranty period on hardware. Warranty certificate required.

3.5.5.6 Include Service Level Agreement for support.

3.6 SCADA DATA GATEWAY TECHNICAL SPECIFICATIONS

3.6.1 The SCADA Data gateway shall have the following specifications as a minimum.

Feature	Requirement
Operating temperature	0 to +75 °C
Enclose material	Aluminum / steel
Power supply	110VDC
Cooling	Fanless
Power consumption	Max 20W
Ethernet interface	4x 10/100/1000 BaseT RJ45, link and traffic LED indicators
EtherNet/IP interface	EtherNet/IP Adaptor with 2-port cut-through switch 10/100/1000 Base T
Serial interface	1 x RS232/RS485 (selectable), 2 USB Ports
IP rating	IP20
Mounting	DIN-rail (EN 50022 standard)/Rack Mount
Form (If Rack mount)	1U/2U/3U
Supported Protocols (Minimum)	OPC-UA Server, IEC61850 Client/Server, IEC60870-5-104 Client/Server, Modbus TCP Client/Server, Modbus RTU Master/Slave, DNP3 Outstation
Certifications	CE, cUL, FCC, RoHS, IEC61850 Level A and B
Configuration Interface	Predefined configuration software tool loaded to the device or through integrated graphical web editor. For Graphical web editor no engineering tools shall be required.

3.7 OPERATOR STATIONS SPECIFICATIONS

3.7.1 General requirements

3.7.1.1 The offered workstations shall be industrialgrade designed for 24/7 operation at the following environmental conditions:

a. Temperature: 0 to 60°C (continuous)
b. Altitude: sea level
c. Installation location: indoor with natural aeration only

3.7.1.2 Total of Five (5) Operator Workstations and One (1) Plant Information Workstation shall be provided. These workstations shall be used for the monitoring and control of the seven engines and associated plant auxiliaries.

3.7.1.3 The operator workstations shall be the latest industrial grade PC from a reliable and proven manufacturer. The performance and specification for these workstations shall meet the intended purposes.

3.7.1.4 Where dual screens are specified, only one keyboard and pointing facility will be required to access both screens.

3.7.1.5 Each operator workstation shall be powered from a redundant power supply arrangement and shall also have redundant network connections to each of the networks to which it is connected.

3.7.1.6 The screen display units shall be as a minimum 22" diagonal LCD screens with high resolution graphics (minimum 1600 x 1200 pixels), with minimum 8 control increment /decrement key built-

in with optical mouse. The screen shall be flicker-free and glare-free complete with standard screen controls such as brightness, etc., accessible to the operator.

Operator Workstation Minimum specifications

3.7.1.7 Workstations shall meet a minimum of the following specifications.

No.	Feature	Requirements
1	Processor type	Intel® Core™ i7- 10th generation series or Intel® Xeon® silver series or Intel® Xeon® Gold series or Intel® Xeon® Platinum series *(Bidder to state exact model on offer)*
2	No of processors & sockets	≥One (1)
3	No of cores on each processor	≥Four (4)
4	No of threads on each processor	≥Eight (8)
5	Processor Base Frequency	≥ 2.6GHz
6	L3 Cache	≥ 8MB
7	Processor TDP	≤100W
8	Workstation Operating system	Licensed, pre-installed Windows 10 pro-64-bit for workstations. OEM licensed for all the processors/cores offered.
9	RAM type	DDR4 Registered (RDIMM) 2400MHz
10	Number of RAM RDIMM slots	≥Four (4)
11	Speed and type of installed RAM modules	DDR4 RDIMM 2400MHz
12	No of installed RAM modules	≥Two (2)
13	Size of each Installed RAM module	≥ 8GB
15	Type of installed drives	≥6G, 2.5-inch, SSD drives
16	Size of each installed SSD drives:	≥ 512GB
17	Number of installed SSD drives:	≥ One (1)
18	Internal optical drive	One (1) DVD+/-RW drive
19	Graphics card	Dual, NVIDIA® Quadro® P series or higher GPU.
20	Number of graphics cards	≥ One (1)
21	GPU Memory size	≥2048 MiB
22	GPU clock	≥1100 MHz
23	Video ports:	≥ Two (2) VGA/HDMI ports.
24	Maximum video resolution supported	≥2560 x 1600
25	Supported Display outputs	≥ Two (2) *(Minimum of dual display output)*
26	Network controller	Embedded 1Gb (or higher), base-T four port ethernet port controller. *(Bidder to state exact controller model and type on offer)*
27	Gigabit Ethernet ports (RJ45)	≥Four (4)
28	PCIE Expansion slots- PCIe X8, X16	≥ Four (4)
29	USB ports	≥ Two (2) rear ports & ≥ Two (2) front ports
30	USB 3.0 ports	≥ Two (2)

No.	Feature	Requirements
31	Audio	Integrated audio with standard 3.5mm line in and line out ports
32	Number of Power supply units	≥Two (2)
34	Power input rating	220-240V AC, 50Hz
35	Power supply Cord	C13 to C14, PDU Style
39	Operating temperature without derating	0 to 60°C continuous
40	Cooling	Fanless
41	Mounting	Rack
42	Form Factor	2U
43	Manufacturer Warranty	years parts, and 2 years basic support

3.8 PLC SPECIFICATIONS, M580 Hot standby redundant CPU

3.8.1 General Specifications

3.8.1.1 PLC System controllers shall be high reliability industrial PLCs designed and manufactured by the contractor. It Shall perform data acquisition, computation, regulatory control functions and sequence/logic control functions.

3.8.1.2 The system controller unit shall also transmit and receive data along the data communication link to and from the redundant servers.

3.8.1.3 The system controller unit shall also transmit and receive data along the data communication link to and from the Operator workstations.

3.8.1.4 Controller hardware shall be rack-mountable type. It shall consist of redundant controller units and remote racks to mount distributed input and output modules.

3.8.1.5 It shall be designed such that it enables scalable configuration system by connecting several remote units with the I/O points.

3.8.1.6 Controller Redundancy:

The PLC systems shall be designed with dual redundancy architecture. It shall have two racks each having its own CPU, memory, input/output ports, communication modules and redundant power supplies (double format).

3.8.1.7 Each controller shall consist of a fault tolerant pair of processors. In this configuration, both processors shall read the input, perform the control application and vote as to the output value sent to the final element. If the processors disagree, they shall have the ability of diagnosing which one is at fault. The PLC shall include extensive hardware and software self-checks including:

a. I/O module not present or un-powered
b. Input over or under range
c. Computational check
d. Communication check
e. Memory parity detection
f. Central processing unit bus time out
g. Power supply threshold checks

3.8.1.8 Controller Change-Over (Hot - Stand by)

The CPU shall be in a hot standby configuration. Seamless switchover between the active and the standby components must be realized to continue controlling the plant without any interruption (fault-tolerant).

3.8.1.9 The switchover time of the CPU shall be no longer than 1 millisecond.

3.8.1.10 Failure of any active controller shall result in switchover to a redundant controller, which shall be automatic and bump less and shall not interrupt control capability or process, but shall be alarmed.

3.8.1.11 Controller and I/O circuit boards shall be removable under power. Card replacement shall automatically download memory from the redundant active/primary controller; transfer back can be manual.

3.8.1.12 Controller Capability:

Controllers shall maintain peer-to-peer communications with all other controllers, data acquisition devices and application softwares in the redundant server (if applicable). Peer-to-peer communications shall allow linking of algorithms from one controller to another without the loss of algorithm linking features such as mode change initialization, override limiting, etc.

3.8.1.13 Controllers shall be self-independent and designed to work without HMI application in the redundant server. The basic control functions can be done by the controllers and all the process data, control logic, sequence and procedures are contained in the controllers.

3.8.1.14 Controllers shall be connected directly using the same control network to redundant servers in order to guarantee the real-time data update every second for plant operation.

3.8.1.15 The controller shall be able to be loaded with algorithims as contained in the existing controller model 140CPU 67160 without modifications. The contractor shall extract the program back-up from existing engine controller.

3.8.1.16 Controller Tracking

Process controllers shall be self-balancing so that bumpless transfer between manual and automatic modes is possible without the need for manual adjustment or balancing.

3.8.1.17 A configuration option shall be available to have the controller set point track the process input so that bumpless transfer between manual, automatic, cascade and computer-controlled set point modes is possible.

3.8.1.18 Controller Security

Security of control shall be ensured by providing internal failure protection circuitry, such that continuous uninterrupted control is ensured in the event of any controller or communication failure.

3.8.1.19 Failure of any controller shall cause an alarm to be generated on the operator's station and be logged in the event list.

3.8.1.20 Loss of both the active and redundant controller shall cause system outputs to "freeze" at their last position or drive to predefined fail-safe conditions. In addition, an alarm shall be generated on the operator's station and be logged in the event list.

3.8.1.21 The Contractor shall demonstrate the extent to which his equipment is fail safe and shall detail any eventualities which will give rise to unsafe conditions.

3.8.1.22 Controller Configuration

The controller database, interface functions, etc., shall be configurable (upload, download, add, delete, modify) while PLC is functioning.

3.8.1.23 Normal operations on any operator station must not be suspended during configuration activities.

3.8.1.24 The Contractor in his proposal shall identify database tag length criteria and how the plant site can utilize the system architecture to permit all plant tag numbers to be uniquely identified within the facility.

3.8.1.25 Alarm priority shall be individually configured for each point. The Contractor in his proposal shall state alarm priorities available. Display colors shall be selectable for each priority type.

3.8.1.26 The exixting controller output actions during plant upset/shutdown conditions shall be maintained.

3.8.1.27 It shall be possible to quickly download a previously configured control scheme to a controller over the data communication link.

3.8.1.28 It shall be possible to update an individual loop configuration without disrupting the normal operation of other loops resident in that controller.

3.8.1.29 Feedback Control

The process controller shall have the capability to perform the following:

a. P, PI, PID Control
b. Gap Control
c. Ratio-bias Control
d. On-Off Control
e. Interlock, sequential and timed control

f. Cascade, remote or local (remote set points from another source such as another controller's output without hardwiring)
g. Computer back-up/manual/auto or supervisory set point
h. Output limits
i. Reset limiting and wind-up prevention
j. Option to have derivative action act on the process measurement rather than the error
k. Output alarms high/low
l. Deviation alarms high/low
m. Rate of change alarm
n. Measurement alarms high-high/low-low and high/low
o. Bad signal alarm, self-diagnostics and system fault alarm

3.8.1.30 Processing Rate

The Contractor in his proposal shall specify maximum and minimum loop control execution time and note whether this parameter can be selected on each loop or is a setting fixed by the controller.

3.8.1.31 Algorithms must be performed within 500 milliseconds for most control loops and 100 milliseconds for critical loops which require a faster response.

3.8.1.32 Sequence of Events (SOE) System

The contractor shall incorporate a Sequence of Events Manager (SEM) which captures records and displays in chronological order the sequence of events (SOE) digital input modules prior to and during a plant trip.

3.8.1.33 The digital input modules with 1mS time stamp capability shall apply time stamp to critical plant trip signals as shall be adviced by the clent.

3.8.1.34 An open communication protocol (Modbus TCP/IP) shall be used for SOE data transmission between the controller and the redundant servers. The SOE data shall be sent to the SOE Server Application, stored in the redundant server and displayed in chronological order on the SOE Viewer screen.

3.8.1.35 The SOE Viewer shall be designed to access and query the SOE Server Application. Each SOE point shall be viewed with its associated time stamp, alarm class, equipment name, event message along with other configured information.

3.8.1.36 A minimum of 64 DI points from DCS shall be available in DCS with 1msec time stamping Event resolution. Document proof needed to identify 1msec Event Resolution.

3.8.1.37 All PLC digital I/O signals shall be configured in HMI application for alarm and event listing purpose.

3.9 PROCESS I/O MODULES AND SIGNAL SPECIFICATIONS

3.9.1 General Specifications

3.9.1.1 The Contractor shall offer any necessary standard process interface equipment to meet input and output requirements described below under signal types.

3.9.1.2 The input modules shall be capable of supporting process signals from all types of process sensors, contacts, proximitors and Namur DIN 19234 without the requirement of an external or auxiliary signal conditioning device. In the case that controller will require signal conditioning for the signal types listed, the Contractor shall indicate and include this in his proposal.

3.9.1.3 The Contractor shall list all types of I/O supported by controller in his proposal. Distinctions shall include controller powered or field powered, grounded or ungrounded thermocouples, thermocouple types, RTD types, intrinsically safe or non-intrinsically safe, voltage levels, output contact rating, etc.

3.9.1.4 Analog loop impedance will not exceed 750 ohms at 20mA or digital (HART).

3.9.1.5 Maintained status or alarm contact inputs will be provided free of voltage and ground. The Contractor's system shall be sensed by the system using 24VDC supply. The negative rail of the contact may be connected to a common ground. The Contractor's system interface shall include circuitry to ensure that any "chatter" or "bounce" encountered during contact closure does not initiate an erroneous alarm.

3.9.1.6 Outputs modules' contacts shall be provided free of voltage and ground in the relay module. The Contractor's system shall accommodate both normally open and normally closed contacts, single-pole double-throw (SPDT). Output contacts shall be rated 24VDC, 3amps, 110VAC, 1amp, 240VAC, 0.5amps suitable for inductive load.

3.9.1.7 Resistance temperature detection (RTD) input modules shall convert signals from four wire resistance bulbs to engineering unit values.

3.9.1.8 The Contractor shall provide current limitation to protect analog inputs. Discrete outputs shall be protected with replaceable fuses (no soldering required).

3.9.1.9 Accuracy Requirement:

Signal output shall be at least 1000 steps for the 0% to 100% range. The input signal resolution shall be as least 12 bit and a bad input signal (over range or under range condition) should be detected by controller.

3.9.1.10 In case of non-linear controller input signals (e.g. temperature), the signal shall be conditioned to compensate for non-linearity. For temperature indicator points, the minimum overall accuracy at reference conditions shall be +/- 1.5% of full scale and minimum resolution shall be one degree. The thermocouple input modules shall have internal configurable temperature compensation capability.

3.9.1.11 Removal of Modules:

Input and output modules shall be capable of being removed from or inserted into a fully powered and operational rack without risk of damage. Failure and subsequent replacement of an input or output modules shall not affect other modules or cause a system failure.

3.9.1.12 Module Card Positioning:

Input and output cards shall be separated in such a manner that cards having similar functions are grouped together with high and low level signals separated as far as possible in order to minimize noise pickup.

3.9.1.13 Modules Card Failure:

In the event of a single input/output point or multiple input/output points on a module card fail, only those failed points shall be affected. The remainder of the points on the card shall remain in operation. Failed input points shall hold their last good value in the controller and be alarmed.

3.9.1.14 Failed output points shall be driven to a fail-safe state as shall be advised by client.

3.9.2 ANALOG INPUT/OUTPUT MODULES:

3.9.2.1 The analog input/output modules shall be able to handle a wide variety of signals. The following inputs/outputs shall be covered:

3.9.2.2 Analog inputs: Signal type is 0/4-20 mA DC, suitable for 4- wire transmitters (power supply for transmitters is external), and 2-wire transmitter (24 VDC power supply for the transmitter shall be supplied from the controller). Short circuit protection by current limiting shall be provided for each channel.

3.9.2.3 Analog inputs (T/C): thermocouples type K, T, J, R, E. Range and type shall be user selectable on per channel basis at site by software tools without need for any re-calibration or mechanical adjustment. Burnout detection shall be available for all channels.

3.9.2.4 Analog inputs (RTD): Platinum RTDs 100 ohm standard DIN4760. Range shall be user selectable at site by software tools without need for any re-calibration or mechanical adjustment.

3.9.2.5 Analog inputs: 1-5, +/- 10, +/-5 Volt DC

3.9.2.6 Pulse inputs: 0-6000 Hz with 24 VDC and/or 12 VDC power supply to the transmitter from the DCS. Range and type shall be user selectable at site by software tools without need for any re-calibration or mechanical adjustment.

3.9.2.7 Analog outputs: 0/4-20 mA DC able to drive load resistance of a maximum 750 ohms. Software selectable

3.9.2.8 Analog outputs: 1-5, +/- 10, +/-5 Volt DC software selectable

3.9.2.9 I/O modules used for accessing analog I/O signals for monitoring purpose may have slower scan rate of 1 second.

3.9.2.10 All analog input/output modules to/from the controller (including temperature signals) shall be able to be provided with isolator (galvanic or optical).

3.9.2.11 The channel density of analog input module shall be 8.
3.9.2.12 The channel density of analog output module shall be 4 or 8 depending on the channel density of the existing module.
3.9.2.13 Each analog module shall be replaceable on-line without disconnecting the wiring between the controller I/O modules and field instrument without affecting other signals in the system.
3.9.2.14 I/O modules used for analog control loops shall scan the input signals at 10 msec rate or better without affecting the signal quality or resolution.
3.9.2.15 Analog input modules (voltage/current) accuracy shall be at least +/- 0.01% of full scale.
3.9.2.16 Analog output modules (voltage/current) accuracy shall be at least +/- 0.03% of full scale.
3.9.2.17 T/C and mV input module accuracy shall be at least +/- 50 microV.
3.9.2.18 Analog output modules shall support fallback function to safe mode immediately upon losing communication with the control module, or failure of control module. The fallback shall have two modes: either causes the output to hold last value or drive it to any pre-defined value within the output range. It is preferable to have the choice to select the fallback mode on per individual channel basis.

3.9.3 DIGITAL INPUT/OUTPUT MODULES

3.9.3.1 The following digital input/output modules shall be provided:
3.9.3.2 I/O modules for discrete signals shall scan the field devices at 20 mSec rate or better.
3.9.3.3 The channel density of digital input/output module shall be 32.
3.9.3.4 Digital input module contact shall be connected directly to transistor type detection circuit.
3.9.3.5 Digital input module shall detect dry contact field switch status changes with sensing voltage supplied from the module side.
3.9.3.6 All digital input modules shall have SOE (Sequence of event) function.
3.9.3.7 The existing Interposing (buffer) relays shall be maintained for discrete input / outputs. Any new interposing relays shall be replaceable type on individual channel bases. Changing of a relay will not require replacing more than the faulty relay, other relays or signals shall not be affected.
3.9.3.8 Each buffer relay shall be provided with indicating lamp or LED to show the signal status.
3.9.3.9 Discrete input modules shall have software configurable filter to eliminate contact chattering.
3.9.3.10 Discrete I/O modules shall have dedicated lamps or LED indications for each channel to show the status of the signal.

3.9.4 SIGNAL QUANTITIES:

3.9.4.1 The supplied redundant server based HMI system shall be able to accommodate all the existing signals (Plant PLCs and ABB RTU560).The existing signals list will be provided as and when needed.

3.9.4.2 All existing plant PLCs and ABB RTU560/ABB MicroSCADA shall not be considered as additional signals.

3.9.4.3 The contractor shall be responsible for confirming the actual signal list quantity and accuracy of the list.

3.9.4.4 The existing PLC I/O signals for one engine mapping is as shown below in tables 1 and 2:

Table 1: Existing I/O system mapping
ENGINE PLC CARDS AND I/O COUNT

Module	Rating 5Vdc	CFC PANEL	CFE PANEL	BJA PANEL	TOTAL MODULES	CHANNEL PER MOD.	TOTAL CHANNELS	TOTAL USED CHANNELS
140 CPS 524 00	8000mA	2	-	-	2	-	-	
140 CPS 511 00	3000mA	1	3	1	5	-	-	
140 CPU 671 60	750mA	2	-	-	2	-	-	
140 NOE 771 11	750mA	2	-	-	2	-	-	
140 CRP 932 00	750mA	2	-	-	2	-	-	
140 CRA 932 00	750mA	1	3	1	5	-	-	
140 ATI 030 00	280mA	-	9	-	9	8	72	69
140 ARI 030 10	280mA	-	2	2	4	8	32	29
140 AVI 030 00	280mA	-	2	1	3	8	24	16
140 ACO 020 00	480mA	1	1		2	4	8	5
140 ACO 130 00	550mA	-	1	1	2	8	16	11
140 DDO 353 00	330mA	1	1	1	3	32	96	59
140 DDI 353 00	330mA	2	2	2	6	32	192	113
140 XBP 006006	-	2	-	-	2	-	-	
140 XBP 010010	-	1	3	1	5	-	-	
TOTAL							440	302

Table 2: Proposed I/O signals mapping
Engine PLC Cards And I/O Count

Module	CFC PANEL	CFE PANEL	BJA PANEL	TOTAL MODULES	CHANNEL PER MOD.	TOTAL CHANNELS	TOTAL USED CHANNELS
Thermocouple card	-	9	-	9	8	72	69
RTD card	-	2	2	4	8	32	29
Analog input card	-	2	1	3	8	24	16
Analog output card	1	1		2	4	8	5
Analog output card	-	1	1	2	8	16	11
Digital output card	1	1	1	3	32	96	59
Digital input card	2	2	2	6	32	192	113

Notes:
(i) Signal Assignment List is attached as Appendix 1.
(ii) The Signal Assignment list details all the existing signals and their nomenclature.

3.10 ENGINEERING WORK STATION (EWS)

3.10.1 General requirements

3.10.1.1 The HMI system shall have a laptop as an engineering station at the Control room to connect to the HMI application through the control network ethernet switches. The engineering station shall perform the following functions as a minimum;

a. Control system configuration.
b. Creation and modification of control logic for the HMI softwares and applications at the servers.
c. Creation of graphics for rendering on an Operator Station (OPS) and Local HMI.
d. Configuration of OPS functions in the server and local HMI.

3.10.1.2 Concurrent engineering shall be possible to allow several people sharing a single engineering database on the network. Alternatively, engineering database created on the separate PCs can be merged. The objective of concurrent engineering is to make system generation and maintenance functions working efficiently so that engineering costs can be reduced.

3.10.1.3 The operation and control functions can be simulated on a EWS PC using virtual test function. Actual controller's hardware are not required, application tests can be performed on an engineering work station (EWS) and verified without any impact on the actual plant operation. User can perform tests to validate each program segment immediately after a user completes it, if the user needs.

3.10.1.4 The contractor shall supply an Engineering workstation (EWS)-laptop, tested and commissioned fully installed with the licensed Human Machine Interface (HMI) software development version and the controller (PLC) licensed programming software.

3.10.1.5 The Engineering workstation (EWS) shall also be equipped with all necessary one-off licenses for the HMI (server HMI and Local HMI software) and PLC data/variables management tools at development level of the applications.

3.10.1.6 The client engineers/technicians shall have the engineer's access level necessary to improve/modify the HMI graphics, database and PLC programs if need be

3.10.1.7 The engineering workstation in addition shall provide all of the engineering tools to configure the system database necessary for operation, monitoring, control and maintenance.

3.10.1.8 It shall include an alpha/numeric keyboard and any other enhanced hardware features as may be required by the system VENDOR.

3.10.2 Minimum requirements.

3.10.2.1 The engineering station shall meet a minimum of the following specifications:

No.	Feature	Requirement
1	Operating System	Microsoft Windows 11 Pro 64bit (Activated)
2	Processor	Intel core i7 CPU @ 2.80GHZ 11th Generation or later.
3	Memory	16 GB of RAM
4	Storage	SSD 1TB
5	AC adapter	230 VAC 50HZ
6	Battery Run time	Up to 13 hours
7	Display	15 "
8	Backlight Technology	LED backlight
9	Keyboard	Numeric Keypad, US layout, Backlight
10	Resolution	1366 X 768 (HD)
11	Display Port	HDMI port
12	Network interface	Integrated 10/100/1000 GbE LAN
13	Wireless technology	Realtek RTL8822CE 802.11a/b/g/n/ac (2x2) Wi-Fi and Bluetooth 5 combo
14	Sound	Stereo speakers & microphones
15	Camera	At least HD 720p
16	Memory Card Reader	SD Card
17	Theft/Intrusion protection	Security Lock Slot
18	Included Accessories	Power adapter, Mouse (Wired USB)
19	Environmental Standard	Energy Star level or equivalent
20	Cable	Provision USB to Rs232 9 PIN MALE CABLE. At least 1 (one) Meter
21	Warranty	2 Years.

3.11 INDUSTRIAL ETHERNET SWITCHES

3.11.1.1 Two (2) rack mount forty-eight (48) port industrial ethernet switch meeting requirements in particular specifications shall be mounted in the server cabinet.

3.11.1.2 Each ethernet switch shall be preinstalled with licensed software and preconfigured to suit the approved Network architecture.

3.11.1.3 All devices and components required to assemble the switches into the cabinet shall be supplied by the contractor irrespective of whether they are stated in the specifications or not.

3.11.1.4 Ethernet switch shall have minimum of the following;

a. Forty-eight (48),10/100/1000 (UPOE) Downlink Ports
b. Two (2) 1000 base-F fiber optic SFP Uplink ports, with LC SFP modules
c. At least 4 GB RAM
d. Two (2) Hot plug, dual redundant power supply units (1+1)
e. Fanless cooling
f. Form Factor, 1U
g. Rack type mounting

3.12 NETWORKING ACCESSORIES

3.12.1.1 As a minimum, the contractor shall provide the following networking accesories and any other materials irrespective of whether they are stated in the specifications or not:

a. RJ45, Cat7, 24 port, shielded Patch panels
b. 24 port rack mount Fibre optic patch panels (LC)

c. Cat7 Twisted pair patch cords (from device to patch panels)
d. Cat7 RJ45-RJ45 Twisted pair patch cords (Patch panel to patch panel)
e. Single mode duplex LC-LC connector Fibre optic patch cords
f. Rack mount cable entry panels for guiding the networking cables
g. KVM host adapter cable connectors
h. KVM console RJ45 patch cords
i. KVM ethernet extenders.

3.13 KVM CONSOLE WITH SWITCH

3.13.1 General requirements

3.13.1.1 Shall consist of an Integrated KVM console with:
a. Integrated retractable 19" LED-backlit LCD monitor.
b. 8-port KVM switch.
c. Illuminated keyboard and touch pad
d. Dual Rail housing

3.13.1.2 Physically the console shall consist of four main parts: Keyboard module, LCD monitor, rear KVM switch and Rack mounting devices/accessories.

3.13.1.3 The Rail system shall allow the keyboard/touchpad and mouse to be pushed back into the housing and out of the way when not in use.

3.13.1.4 The LCD screen shall be rack mounted non retractable for convenient monitoring of server operation.

3.13.1.5 Console shall support remote KVM over IP access through Ethernet. It shall have an ethernet port.

3.13.1.6 KVM switch shall support multi user access via IP and locally via a secondary console.

3.13.1.7 Console shall be connected to the servers via KVM adapter cables designed to connect to the host computer USB and video port.

3.13.1.8 KVM cable shall consist of space-saving RJ-45 connectors on the console side and Cat 5e/6/7 cabling.

3.13.1.9 The Console shall use a secondary console port to allow access of computers connected to the LCD KVM switch from an external console.

3.13.1.10 Console keyboard module shall consist of the standard 105 key keyboard, touch pad, KVM port selection buttons & power and other status indication LED's and a front facing USB port Supporting an external USB mouse.

3.13.1.11 Keyboard shall have LED illumination light to illuminate the keyboard and touchpad to allow visibility in lowlight conditions.

3.13.1.12 Console shall have a port for firmware updates.

3.13.1.13 Console shall allow easy computer selection via pushbuttons, Hotkey Mode, OSD (On-screen Display), or Browser-based GUI.

3.13.1.14 Shall support multiple browsers: Internet Explorer, Chrome, Firefox, Safari, Opera, Mozilla, Netscape etc.

3.13.1.15 The KVM console mounting panels, brackets, levers and Switch casing/enclosure shall be made of steel.

3.13.1.16 Accessories, features and devices usual and necessary for a server cabinet rack mounted KVM console and switch shall be supplied and installed by the contractor irrespective of whether they have been specified or not.

3.13.1.17 The offered KVM console shall be enterprise grade designed for 24/7 operation at the following environmental conditions:
a. Temperature: 5 to 45°C (continuous)
b. Altitude: sea level
c. Installation location: indoor with natural aeration only

3.13.2 Minimum specifications

3.13.2.1 KVM console shall meet the following minimum specifications

No	Feature	Requirements
1	Secondary Console Ports	≥Two (2) USB ≥One (1) video (DVI/VGA/DP/HDMI)
2	External USB Mouse Ports	≥one (1)
3	Number of KVM Ports (RJ-45 Female)	≥Eight (8)
4	LAN Ethernet Ports (RJ45)	≥one (1)
5	Port selection Push buttons	≥Eight (8)
6	Port online status LEDs	≥Eight (8)
7	Port selected status LEDs	≥Eight (8)
8	Ethernet status LED	Two (2)
9	Console power status LED	one (1)
10	LCD power status LED	one (1)
11	KVM cable console connector	one (1) RJ45 male
12	KVM cable type	Cat6/7
13	KVM cable length	≥2m
14	KVM host adapter cable connectors	Two (2) USB and One (1) video (DVI/DP) *Video connector to be compatible with the server & workstation video ports*
15	KVM cables to be supplied for each Console unit	≥Eight (8) *(un utilized cables to be provided as spares)*
16	LCD Monitor Panel size	19.0 inch
17	LCD Monitor Maximum resolution	≥ 1280 x 1024@75Hz
18	LCD Monitor brightness	≥250cd/m2
19	LCD Monitor Contrast ratio	≥1000:1
20	LCD Monitor Viewing angle	≥170°(V) /160°(H)
21	LCD Monitor Display colors	≥16. 7 M (True 8bit)
22	LCD Monitor mounting	8U rack mount.
22	Power supply	Internal 220-240V AC, 50Hz power supply unit.
23	Power supply Cord	C13 to C14, PDU style
24	Operating temperature without derating	0 to 45°C continuous
25	Enclosure & support brackets	Robust steel construction.
26	Mounting type	1U rack
27	Mounting accessories	Rack slide rails to be provided
28	Manufacturer warranty	≥Two (2) years

3.13.3 Product Certifications

3.13.3.1 Device must be tested and approved for use in the EU or USA or Canada. Proof of testing and certification **MUST** be provided.

3.13.3.2 Product certification from an EU or USA or Canada reputable firm MUST be provided along with the bid.

3.14 SERVER CABINET

3.14.1 General requirements

3.14.1.1 42U Rack type free standing cabinet.

3.14.1.2 Colour shall be either be:

a. RAL 7035 - light grey or
b. RAL 9005 fine texture - black or
c. Graphite Metallic equivalent

3.14.1.3 Cabinet Shall have:

a. Perforated sheet steel front door.
b. Split(double), perforated sheet steel rear doors,
c. multi-piece roof plate for side cable entry on both sides,
d. Open base frame, without side panels.

3.14.1.4 Two 482.6 mm (19") vertical mounting rails, front and rear, on depth stay.

3.14.1.5 Side panels, two-piece with quick-release fastener, security lock

3.14.1.6 Accessories such as tool-free "snap-in technology" options for air flow, cable management, shelves, power distribution units and all other necessary and specified accessories

3.14.1.7 All un-utilised mounting racks shall be blanked from the front with easily removable blanking plates.

3.14.1.8 The following devices shall be provided and installed on the panel:

a. Two (2) sets of keys (front and rear)
b. Top mounted roof exhaust cooling fans
c. Roof exhaust cooling Air throughput ≥750m3 /h
d. Roof exhaust cooling fan mounting size ≥290mmX290mm

3.14.1.9 All panel mounted equipment shall be labelled using Aluminum anodized plate or engraved plastic Castings as detailed below.

3.14.2 Labelling

3.14.2.1 All Panels, switch boards, cubicles and all front mounted equipment as well as equipment mounted inside the panels shall be provided with individual labels with equipment designation engraved for identification. The labels shall be mounted directly above the respective equipment with English description and also where appropriate the IEC Number

3.14.2.2 The Device Name/Number shall correspond to the Name/Number used in the drawings. All panel devices shall also be provided tag numbers corresponding to the ones shown in the panel internal wiring drawing to facilitate each tracing of wiring. These labels shall be mounted directly by the side of the respective equipment and shall not be hidden by the equipment wiring.

3.14.2.3 Labels shall be made of Aluminium anodized plate or engraved plastic Castings. The entries on the plates shall be indelibly marked by engraving with black letter on a white background. The plates shall be made of weatherproof and corrosion-proof materials and shall not be deformed under the service conditions at the site.

3.14.2.4 All devices e.g. relays, timers, MCB's, instruments etc. shall be given standard IEC abbreviation numbers with name of device, corresponding to the ones shown in the panel internal wiring drawings.

3.14.2.5 Major equipment shall be provided with a rating plate containing the necessary information specified in the relevant IEC standards.

3.14.3 Frames

3.14.3.1 Frame shall be made of sheet steel metal plate of at least 1.5 mm in thickness.

3.14.3.2 Shall consist of Pre-configured rack consisting of Torsional stiff, welded symmetrical frame of rolled 16-fold vertical members connected with two horizontal frames of rolled 9-fold members with integral channel for accommodating the adjacent panel seal and protecting it against possible effect of aggressive media.

3.14.3.3 All frame members, with integral system holes on a 25 mm DIN pitch pattern, allow convenient interior installation by simple fitting and securing of equipment. All sections have chamfered edges. The vertical frame members each have two depth-recessed horizontal mounting rails that can be used for flexible attachment of installation components.

3.14.3.4 Enclosures are bay-able on all sides: on the left, right, front and rear and at the top or round corners.

3.14.3.5 Baying of cabinets shall be accomplished without disturbing any installed cables or rack mounted equipment

3.14.3.6 Baying of cabinets shall be easily accomplished with simple tools

3.14.3.7 Baying cabinets will not add any additional overall width to a contiguous row

3.14.4 Front Door

3.14.4.1 Sheet steel front door with a specific honeycomb perforation, vented surface area, 85% perforated.

3.14.4.2 Four-point locking rod, comfort handle for semi-cylinder, with security lock.

3.14.4.3 Four hinges, with captive hinge pins, hinge opening angle with stand-alone siting 180°, door hinge may be swapped to opposite side without dismantling locking rods.

3.14.5 Rear Door

3.14.5.1 Sheet steel rear doors, vented, vertically divided, for space-saving installation of the enclosures and easy access to the components.

3.14.5.2 Specific honeycomb perforation, vented surface area, 85% perforated. doors with foamed-in seal.

3.14.5.3 Main door with four-point locking rod, comfort handle for semi cylinder, with security lock.

3.14.5.4 Adjacent door with additional internal swing lever handle and two-point locking rod.

3.14.5.5 Main and adjacent door with four hinges, hinges with captive hinge pins, hinge opening angle with stand-alone siting on both sides 180°.

3.14.6 Roof

3.14.6.1 Multi-piece roof plate for side cable entry via brush strips across the entire enclosure depth. Roof plate for retrofitting, removable despite already made cable routing.

3.14.6.2 Cable entry outside the mounting rails is possible

3.14.6.3 Cut-out for accommodating a fan module integrated in the roof.

3.14.6.4 Panel cooling fan to be mounted with ratings as specified in the proceeding clauses.

3.14.7 Base plate

3.14.7.1 Open base frame, gland plates, and other accessories for cable termination to be provided.

3.14.8 Mounting Rails

3.14.8.1 With two 482.6 mm (19") vertical mounting rails, front and rear. The static total load capacity of both mounting rails shall be at least 15,000 N.

3.14.8.2 Universal mounting rails shall support installation of industry standard 19" rack mount server, network and electronic components, infinitely depth variable attached to depth stays.

3.14.8.3 The attachment of the mounting rails shall be flexible and tool-less using quick release fasteners or screw-fasteners as an alternative.

3.14.8.4 Mounting rails, front and rear, including additional pitch pattern of holes according to standard EIA 310 E.

3.14.8.5 All height units shall be labelled and numbered in the opposite direction. U labelling of both mounting rails shall be readable from the front for easy one-man assembly.

3.14.8.6 Each U space shall be marked on the middle hole of each U. Each U shall consist of three holes and measure 1.75" or 44.45 mm high. Each U space marking shall be printed, not adhesive backed.

3.14.8.7 All depth stays with integral pitch pattern for fast determination of the mounting distance and the remaining front free space (clearance).

3.14.8.8 19" mounting rails shall have two additional sets of mounting holes, shall match hole pattern of the frame and allow for the installation of various accessories, i.e. vertical cable management, horizontal cable management, power strips, etc.

3.14.8.9 Front mounting rails prepared for tool-less accommodation of cable routing aids and organization of a structured cabling in maximum packaging density or for equipment with a sensor strip for automatic identification of the installed components by means of Radio Frequency Identification (RFID).

3.14.8.10 Rear mounting rails prepared for two-sided accommodation of a Power Distribution Unit (PDU) in 1 U form factor for enclosure electrification, without waste of installation volume thanks to space-saving side mounting between mounting rail and side panel in the Zero-U space.

3.14.8.11 Enclosures widths equal to or greater than 28"/700 mm allow for 19", 21", and 23" rack mounting of components and/or allow for the offsetting of 19" rails, left or right, to allow for additional cable management and air plenum space.

3.14.9 Grounding

3.14.9.1 All enclosure components such as doors, sidewalls, roof, etc. Shall be bonded directly to the frame Grounding points.

3.14.9.2 A copper busbar shall be mounted on the cubicle for grounding the electrical equipment.

3.14.9.3 Conductors of 4 mm2 diameter and a central ground point for connection to the building service connection shall be provided

3.14.9.4 The mounting rails shall be connected to the frame by 4 mm conductors.

3.14.9.5 Cabinet shall comply with IEC 60950 safety standard applicable to mains-powered or battery-powered information technology equipment.

3.14.10 Cable management

3.14.10.1 All cables (patch cords, power cords etc.) shall be guided neatly in the cabinet.

3.14.10.2 Horizontal & vertical cable managers shall be supplied and installed for guiding all cables in the cabinet

3.14.10.3 Cable managers shall be made of halogen free & flame-retardant materials.

3.14.10.4 Cable ties shall not be used to support cables to frames or to mounting rails. When used, cable ties shall only be used to guide and arrange cables in the cable managers.

3.14.10.5 All cables shall be labelled clearly with an indelible printed/engraved PVC label.

3.15 PANEL MOUNT COMPACT INDUSTRIAL PC – NEW LOCAL CONTROL PANEL

3.15.1 General Requirements

3.15.1.1 One (1) Panel Mount Compact industrial PC with 19" Display shall be fitted on the new Local Control Panel at the Engine Upper Floor.

3.15.1.2 The operation and monitoring functions of the Diesel Generator shall be realized by applying the HMI related software.

3.15.2 Minimum specifications

3.15.3 The Compact Industrial PC shall meet a minimum of the following specifications:

No.	**Feature**	**Requirement**
1	CPU	Fanless Intel i5 dual core processor, 3.0 GHz or better
2	Memory	At least 8GB DDR3 RAM
3	Storage	At least 128GB SSD
4	Operating System	Windows 10 Pro (64 bit English)
5	Communication ports	2x Giga Ethernet (RJ45),2x USB 3.0,2x COM(RS-232/422/485)
6	I/O ports	1xHMDI video port, 1xHD audio port
7	Communication Protocols	Ethernet TCP/IP, Modbus TCP, Modbus RTU
Panel Display		
1	Type	Flat screen
2	Terminal type	Touchscreen display
3	Device mounting: Flush	Device mounting: Flush
4	Local signaling Status	LED
5	Optimum Viewing angle horizontal x vertical	At least 120 x 100°
6	Contrast ratio	500:1
7	Pixel resolution	1366 x 768 pixels
8	Touchscreen resolution	1366 x 768
9	Supply voltage	18…36 V DC
10	Power consumption (Max)	65 W
11	Display size	19 inches
12	Display type	Color HD TFT
13	Display resolution	1366 x 768 pixels
14	Display color:	16 million colors
15	Luminance:	> 200 cd/m², adjustable
16	Backlight lifespan	> 50000 hours at 25 °C
17	Touch panel	Multi-touch projected capacitive technology (PCT)
18	Type of installation	Indoor installation
19	Width	483 mm
20	Height	337 mm
21	Depth	31mm enclosure
22	Front Panel I/O ports:	1 USB port (12Mbps), protected by IP 66 cover
23	Front Panel Material	Aluminum alloy with IP66 membrane on treated steel frame
24	Front panel Screen Protection	7H Hardness Anti-scratch front
25	Protection	IP66
26	Environmental Standards	UL 60950/CSA C22.2 No 60950
27	Product certifications	EAC, C-Tick, CCC
28	Ambient air temperature for operation	0…60 °C

29	Ambient air temperature for storage	-30…70 °C
30	Relative humidity	10…95 % non-condensing
31	Operating Altitude	Sea Level
32	Manufacturer Warranty	3 years

3.16 New Control Panel for Local HMI

3.16.1 General requirements

3.16.1.1 The new local control panel will house the Local HMI 19" LCD display.

3.16.1.2 All existing analog indicators, meters, counters and switches in the existing local maneuvering panel shall be moved to the new local control panel. The existing wiring may be re-used.

3.16.1.3 The control panel shall meet the following specifications as a minimum;

3.16.2 Dimensions

The panel enclosure dimensions to be 800mm (H) by 700mm (W) by 400mm (D).

3.16.3 Color

3.16.3.1 Color of the panel shall be RAL7032.

3.16.4 Material

3.16.4.1 The panel material shall be mild steel.

3.16.5 Mounting

3.16.5.1 The panel shall have wall mounting brackets/provisions.

3.16.6 Labelling

3.16.6.1 Labels shall be made of Aluminum anodized plate or engraved plastic Castings. The entries on the plates shall be indelibly marked by engraving with black letter on a white background. The plates shall be made of weatherproof and corrosion-proof materials and shall not be deformed under the service conditions at the site.

3.16.6.2 All equipment mounted inside the panels shall be provided with individual labels with equipment designation engraved for identification. The labels shall be mounted directly above the respective equipment with English description and also where appropriate to the IEC Standards.

3.16.6.3 The Device Name/Number shall correspond to the Name/Number used in the drawings. All panel devices shall also be provided with tag numbers corresponding to the ones shown in the panel internal wiring drawing to facilitate easy tracing of wiring. These labels shall be mounted directly by the side of the respective equipment and shall not be hidden by the equipment wiring.

3.16.7 Door

3.16.7.1 Two-point locking rod, comfort handle for semi-cylinder, with security lock.

3.16.7.2 Two hinges, with captive hinge pins, hinge opening angle with stand-alone siting 180°, door hinge may be swapped to opposite side without dismantling locking rods.

3.16.8 Base Plate

3.16.8.1 Open base plate, gland plates, and other accessories for cable termination to be provided, made of sheet steel metal plate of at least 2.0 mm in thickness.

3.16.9 Grounding

3.16.9.1 All enclosure components such as doors, sidewalls, roof, etc. shall be bonded directly to the frame Grounding points.

3.16.9.2 A copper bus bar shall be mounted on the cubicle for grounding the electrical equipment.

3.16.9.3 Conductors of at least 6mm2 cross-sectional area and a central ground point for connection to the building service connection shall be provided

3.16.9.4 The mounting rails shall be connected to the frame by 6mm2 conductors.

3.16.9.5 Cabinet shall comply with IEC 60950 safety standard applicable to mains-powered or battery-powered information technology equipment.

3.16.10 Panel cooling

3.16.10.1 The panel shall be fitted with two cooling fan and filter units one either side of the panel.

3.16.10.2 Each cooling fan and filter unit shall be rated 240VAC 50 Hz with air throughput of atleast100 m^3/h. Fan control shall incorporate a thermostat.

3.16.11 Components Mounting

3.16.11.1 All devices and components inside the panel shall be mounted on a prefabricated 25mm Aluminum DIN rail.

3.16.12 Cable management

3.16.12.1 All cables (patch cords, power cords etc.) shall be guided neatly in the cabinet.

3.16.12.2 Horizontal & vertical cable managers shall be supplied and installed for guiding all cables in the cabinet

3.16.12.3 Cable managers shall be made of halogen free & flame-retardant materials.

3.16.12.4 Cable ties shall not be used to support cables to frames or to mounting rails. Can only be used to guide and arrange cables in the cable managers.

3.16.12.5 All cables shall be labelled clearly with an indelible printed/engraved PVC label.

3.16.12.6 All existing and new cables shall be appropriately glanded into the cable glanding plates.

3.16.13 Environmental protection

3.16.13.1 The panels ingress protection shall be of at least IP44.

3.17 CYBER SECURITY

3.17.1 General Requirements

3.17.1.1 Contractor shall supply cyber security equipment and engineering services for setting up and deploying a cyber security solution suited for SCADA network (OT) interfaced to the corporate/office (IT) network.

3.17.1.2 The offered solution shall be delivered in a unified platform with consolidated security management across both IT and OT networks.

3.17.1.3 In order to ensure the unified solution mitigates attacks at each step of the cyber-kill chain, the chosen solution must meet the given requirements.

3.17.2 Cyber Security Software

3.17.2.1 Bidder shall supply, install and configure all the software required for the operation of the cyber security appliances, security management server and features and settings necessary and usual for industrial control system cyber security solution

3.17.2.2 Cyber security software with perpetual licenses and three-year subscription licenses where allowed as detailed in particular specifications shall be supplied, installed and configured into the Enterprise grade cyber security appliances (gateways), each of the cyber security appliance/gateway shall contain the features and functions detailed in the particular specifications.

3.17.2.3 The features and functions shall include:

a. Next generation firewall
b. Identity Awareness (identity services for identity-based firewall policy)
c. IPsec VPN
d. Intrusion Prevention System (IPS)

e. Advanced Networking & Clustering for optimum performance and high availability (QoS prioritization, load sharing and balancing, redundancy etc.)
f. Mobile access (Secure SSL VPN access, two-factor authentication, Device/end-user pairing etc.) for safe remote access from mobile devices
g. Application control for DCS/ICS protocols and devices with visibility to a minimum of the following protocols;
    a. IEC-60870-5-104
    b. IEC 60870-6 (ICCP)
    c. IEC 61850
    d. Modbus
    e. OPC
    f. Profinet
    g. S7 (Siemens)
h. URL Filtering
i. Antivirus
j. Anti-Spam
k. Anti-Bot

3.17.2.4 Three (3) years software support for the enterprise cybersecurity appliance/gateway software to be provided.

3.17.2.5 Installation, configuration and testing of the cyber security appliances and server prior to delivery.

3.17.2.6 In depth training on cyber security as detailed in the proceeding clauses.

3.17.2.7 Commissioning of the entire cyber security infrastructure after panel installation by the procuring entity. Commissioning shall involve:

a. Modifying all settings to suite the procuring entity applications and users.
b. Configure active/active redundancy for all security appliances/gateways in the network.
c. Initialize all cyber security services in the network.
d. Test the configured settings and services and optimize them for best security, performance and reliability.
e. Development and deployment of cyber security policies for devices and users.
f. Carry out any necessary configurations in the servers, ethernet switches, industrial PC's, virtual machines etc. necessary for optimal security solution.

3.17.2.8 All Cyber security solution services MUST be conducted together with the procuring entity personnel. All actions carried out by the contractor shall be done together with the procuring entity personnel. No action during commissioning shall be carried out in absence of the procuring entity personnel.

3.17.2.9 The bidder MUST provide a unified gateway that has: (technical data sheet brochure to be provided)

a. Intrusion Prevention System (IPS)
b. Application Control with over 5,000 web 2.0 applications
c. Threat Emulation with OS and CPU level inspection.
d. Threat Extraction to scrub files of active content.
e. URL Filtering supporting enforcement of timed access to sites and the ability to educate users.
f. Anti-Bot and Anti-Virus. Analyzing over 200 million addresses for bots and more than 250,000 websites
g. Anti-Spam and Email.
h. IPSec VPN with support for multiple authentication options such as User Certificates, CAPI, one-time tokens, software and hardware smartcards.
i. Mobile Access for at least 5 concurrent users, for SSL access to corporate web applications
j. Identity Awareness for visibility into users' and group activity.

k. Management of security policies from a single pane of glass
l. Governance Risk and Compliance monitoring and reporting.
m. The bidder MUST attach a publicly available datasheet detailing the following Endpoint features:
    i. Anti-Malware
    ii. Media Encryption and Port Protection
    iii. Firewall and Application Control
    iv. Threat Emulation
    v. Remote Access VPN
    vi. Capsule Docs
    vii. Anti-Bot
    viii. Forensics and Anti-Ransomware

3.17.3 Technical Specifications cyber–Security Functions

3.17.3.1 General requirements

3.17.3.1.1 Bidder shall in their offer attach a publicly accessible reference document confirming that their security solution meets all the requirements in the subsequent sub clauses.

3.17.3.3 Firewall

3.17.3.3.1 The security appliances must use Stateful Inspection based on granular analysis of communication and application state to track and control the network flow.

3.17.3.3.2 Solution must support access control for at least 150 predefined /services/protocols

3.17.3.3.3 Must provide security rule hit count statistics to the management application.

3.17.3.3.4 Must allow security rules to be enforced within time intervals to be configured with an expiry date/time.

3.17.3.3.5 The firewall must support user, client and session authentication methods.

3.17.3.3.6 The following user authentication schemes must be supported by the security gateway and VPN module: tokens (i.e. -SecureID), TACACS, RADIUS and digital certificates

3.17.3.3.7 IPv6 Support
    i. Solution must support IPv6 traffic handling on IPS and APP module, Firewall, Identity Awareness, URL Filtering, Antivirus and Anti-Bot
    ii. Solution must Support 6 to 4 NAT, or 6 to 4 tunnels
    iii. Solution must support AD integration using IPv6 traffic

3.17.3.4 Intrusion Prevention System

3.17.3.4.1 IPS must leverage software-based acceleration technologies to deliver security and performance.

3.17.3.4.2 IPS must have mechanism of validating RFC compliance of protocols and checking anomalies

3.17.3.4.3 IPS must provide geo-protections to allow the administrator to easily block inbound and/or outbound traffic based on countries.

3.17.3.4.4 IPS must be based on the following detection mechanisms: exploit signatures, protocol anomalies, application controls and behaviour-based detection

3.17.3.4.5 IPS must be able to fail open during high load.

3.17.3.4.6 IPS must be integrated with firewall, application control, URL filtering, Antibot and Sandboxing features on a unified platform.

3.17.3.4.7 The IPS vendor must supply evidence of leadership in protecting Microsoft vulnerabilities.

3.17.3.4.8 IPS must support consolidated management on a single pane of glass.

3.17.3.5 Anti-Bot and Anti-Virus

3.17.3.5.1 Solution must have an integrated Anti-Bot and Anti-Virus

3.17.3.5.2 Antibot must be able to detect bots and block communication to command-and-control sites.

3.17.3.5.3 Anti-Bot and Anti-Virus policy must be administered from a central console

3.17.3.5.4 Anti-virus must leverage a cloud database with over 4 million malware signatures.

3.17.3.6 Sandboxing and File Scrubbing

3.17.3.6.1 Sandboxing must perform deep CPU-level inspection in order to stop the most dangerous attacks before malware has opportunity to deploy and evade detection.

3.17.3.6.2 Sandboxing must use OS-level inspection to examine a broad range of file types, including executables and data files.
3.17.3.6.3 Sandboxing must provide option for running as a cloud-based service or running on premise.
3.17.3.6.4 File scrubbing must support removal of active content and other exploitable content from infected documents.
3.17.3.6.5 File scrubbing must provide the option to convert reconstructed files to PDF or to keep the original format.
3.17.3.6.6 Sandboxing must support emulation of over 40 file types including; flash, Java Applets, PIF, exe, Microsoft office and Adobe PDF.
3.17.3.6.7 Sandboxing and File scrubbing solution must support deployment as a Mail Transfer Agent.

3.17.3.7 Email Security (Antispam)

3.17.3.7.1 Anti-Spam and Email security application must be content/format and language agnostic
3.17.3.7.2 Antispam must include an antivirus engine that scans mail protocols such as SMTP and POP3.
3.17.3.7.3 The Anti-Spam and Email security application must include IP and content reputation checks.
3.17.3.7.4 Solution must have the option to include a Zero-hour protection mechanism for new viruses spread through email and spam without relying solely in heuristic or content inspection

3.17.3.8 Security Management

3.17.3.8.1 Security management application must be able to co-exist on the security gateway as an option.
3.17.3.8.2 Security management must support unified management of both physical and virtual networks, endpoints and Office365
3.17.3.8.3 Security management must support concurrent administration.
3.17.3.8.4 Security management must support integration with LDAP-based information stores to centralize user management.
3.17.3.8.5 Security management must provide browser-based access to administrators and auditors to view policies, gateway status and user administration.
3.17.3.8.6 Security Management must provide APIs to enable self-service and automated workflows.
3.17.3.8.7 Security management must support central management of policy change management with review and audit capabilities of policy changes.
3.17.3.8.8 Security management must enable administrators to action on identified events such as by blocking it immediately.
3.17.3.8.9 Security management must support management of endpoint security.
3.17.3.8.10 The Log analysing must support creation of custom log queries. (Must attach and reference a publicly accessible datasheet)

3.17.3.9 Data Loss Prevention (DLP)

3.17.3.9.1 The gateway must have an option to add an integrated Data Loss Prevention application.
3.17.3.9.2 The vendor should have an option to provide a fully integrated secure mobility solution on the next generation firewall.

3.17.3.10 Best Practice Governance Risk and Compliance (GRC)

3.17.3.10.1 Vendor must have an option to provide a fully integrated Governance Risk and Compliance application
3.17.3.10.2 Vendor must have an option for Real Time Compliance Monitoring across all security services in the product
3.17.3.10.3 Vendor must have an option to Deliver real-time assessment of compliance with major regulations (PCI-DSS, HiPPA, SOX...)
3.17.3.10.4 Vendor must have an option for Instant notification on policy changes impacting compliance
3.17.3.10.5 Vendor must have an option to Provide actionable recommendations to improve compliance
3.17.3.10.6 Vendor must have an option to recommend Security Best Practices

3.17.4 Enterprise Grade Cyber Security Appliance (Gateway)

3.17.4.1 Minimum specifications

Each enterprise security Appliance/gateway in scope of supply shall meet the following minimum specification

No.	Feature	Requirements
1	Firewall throughput	≥10 Gbps
2	IPS throughput	≥2.4Gbps
3	AES-128 VPN throughput	≥1.6Gbps
4	Firewall, Application Control and IPS throughput, services running concurrently	≥2 Gbps
5	Full Threat Prevention (Firewall, Application Control, URL Filtering, IPS, Antivirus, Anti-Bot and Sandblast) throughput	≥700 Mbps
6	Processor	≥Dual core
7	Memory	≥16GB
8	Storage	≥240GB SSD
9	Total number 1GB Base-T Ethernet ports (RJ45)	≥six (6)
10	Device management console ethernet port	≥One (1)
11	Lights Out Management ethernet port	≥One (1)
12	Remote device Management and monitoring protocol support	HTTPS Web Interface SNMP v1/v2c/v3 syslog
13	User management	Microsoft AD, LDAP, RADIUS, Cisco pxGrid,
14	Concurrent connections	≥3 Million
15	Connections per second	≥110,000
16	Redundancy	Active/Active and Active/Passive
17	Power supply unit type	internal
18	Power supply unit rating	≥ 250W
19	Power input rating	110–240V AC, 50Hz
20	Enclosure type	Steel or metallic equivalent
21	Enclosure Protection as per IEC 60529	≥IP20
22	Mounting:	Rack type
23	Form factor (fully configured):	1U
25	Continuous ambient operating temperature	–5° C to +40°C
26	Operating Relative Humidity (non-condensing)	5 to 95%
27	Operating altitude without derating	≥Sea Level
28	Manufacturer Warranty	≥2 years

3.17.4.2 Device Ruggedness

a. Immunity to EMI and heavy electrical surges
    i. Meets IEEE 1613 (electric utility substations)
    ii. Meets IEC 61850-3 (electric utility substations)

b. Environmental withstand testing
    iii. Meets IEEE 1613
    iv. Meets IEC 61850-3
    v. Meets ETSI EN 300 019-2
c. Fully independent 2kV (RMS) isolated ports
d. -40°C to +75°C operating temperature (no fans)
e. Contain no moving parts such as fans
f. galvanized steel enclosure at least 18 AWG thick

4 PROJECT WORK PROGRAM

4.1 General

4.1.1 Within one month after the date of tender award, copies of the work schedule shall be prepared in the form of a Critical Path Method Network, covering the Engineering design, delivery, installation, testing, commissioning and training of the Works, in sufficient detail defining the various sections of the Works, including parts to be supplied by the Contractor.

4.1.2 The client will allow a period of 3 months [90 days] or appropriate time for these activities in the overall program.

4.1.3 The work Program shall become a part of the Contract. However, in executing the work Program of this Contract, the Contractor shall co-operate with the Client in order to effect the timely completion of the works as a whole.

4.2 Drawings and As Built Documentations

4.2.1 All documentation will be in English and shall be handed over to the client's Control and DCS Engineers at site not later than one month after commissioning date.

4.2.2 This documentation shall include but not limited to:

i. Operation/User manuals
ii. Configuration/data sheets
iii. Installation manual guide
iv. Wiring diagrams

4.2.3 The documentation shall cover all programs in the DCS control system.

4.2.4 The number of copies shall be furnished as follows:

i. Complete set of Bound prints - 3 copies
ii. Complete set of Soft copies - 3 copies

4.3 Test Procedure Instructions

4.3.1 The Contractor shall prepare and execute a testing program which will establish that specified control system has been met and that the equipment furnished and installed will perform as specified and required. The migration from the existing system to the upgraded system shall be jointly done between KenGen and contractor staff.

4.4 Maintenance Equipment

4.4.1 All maintenance equipment required for the control system (other than test equipment) shall be included in the price schedule and will be handed over to the client in good order on completion of commissioning tests.

4.4.2 These will include but not limited to one engineering laptop to handle the control Logics, control applications and the HMI mimic designs.

4.5 Operation and Maintenance Manuals

4.5.1 The documentation shall be written in English language. This shall contain; Introduction, overall operating philosophy, operating conditions, detailed description of the equipment, emergency procedures, description of equipment arrangement schematics, maintenance instructions, installation instructions, wiring drawings, Schematics drawings, network drawing (including IP addresses) of all the devices in the system and any other changes included in the new design .

4.5.2 Three sets of manuals shall be provided. The manuals shall contain:

i. Equipment overall design, specific and special features of design including descriptive drawings where practicable, schematic diagram including block diagrams, list of internal material, connection and terminal list, equipment and components dimensional drawing and control diagrams.
ii. Complete operating instructions: included shall be precautions and critical points to be observed, including suggested form to be used in taking periodic readings to maintain an operations record. There shall be a tabulation of possible operating difficulties with the probable causes listed and remedial action to be under each one.

iii. Design Data for the equipment specifying power, kilowatts, voltage, amperage, temperature etc. characteristic curves for the equipment.
iv. Complete instructions for ordering replacement parts in a manner that would prevent errors or misunderstanding. Recommended forms for tabulating replacement part information and instructions for returning materials to the factory shall be included.
v. As Built Drawings and Commissioning test report (to be submitted 1 month after commissioning)

4.6 Spares during the 24 Months Warranty Period

4.6.1 It is a condition of this contract that all malfunctioning items during the warranty period, to start after issue date of Take over Certificate, shall be replaced by the Contractor at his own cost.

4.7 Functional Design Specification (FDS)

4.7.1 After award of contract, the contractor shall come up with a detailed proposed automatic control and PLC HMI system functional specification. The detailed design shall include but not limited to overall Plant control block diagram detailing all control equipment within the plant control network which include among others the PLCs, Servers, Local HMI, HV Substation Control system, operator workstations, GPS, Cyber security, networking devices, etc.

i. Detailed PLC HMI control system architecture.
ii. Detailed description of all software used.
iii. Detailed description of all the communication protocols used.
iv. Detailed description of alarm management.
v. Detailed description of system database nomenclature.
vi. Detailed description of HMI operating philosophy.
vii. Process control system network architecture which shall include redundant switches and dual Ethernet ports for the computers and servers.
viii. Detailed DCS system hardware design.
ix. Major components description.
x. Detailed hardware design including technical descriptions, power requirements, components identification.

5 TESTING AND COMMISSIONING

5.1 Factory Acceptance Test

5.1.1 The Contractor shall notify KenGen of the date of FAT in writing 8 weeks prior to factory test start date to allow witnessing of the test by KenGen.

5.1.2 FAT shall be performed according to a FAT procedure that shall be written by the Contractor and approved by KenGen prior to execution of the FAT. Contractor shall submit this test procedure for approval 14 weeks prior to factory testing start date.

5.1.3 FAT procedure shall be a detailed item-by-item procedure of the tests to be performed for both hardware and software. In the FAT procedure, Contractor shall also identify the methods of deficiency identification, recording and rectification.

5.1.4 FAT will include physical, functional, dimensional, arrangement (Servers, GPS, Firewall, Network switches, Operator workstations and Local HMI, Substation gateway, Cabinet Layout, PLC, I/O Modules, Engineering Workstation, Communication devices, all application software, wiring, etc.) and identification checks.

5.1.5 FAT shall include all system communication checks, which will be integrated to Servers, Substation gateway, Firewalls, GPS and Operator workstations.

5.1.6 FAT shall be conducted under the following conditions:

i. All equipment shall be powered on.
ii. Test programs and/or system programs shall be running during the whole test.

5.1.7 FAT shall be conducted by Contractor on the fully assembled and wired system including all peripheral devices and witnessed by KenGen representative(s).

5.1.8 All testing equipment shall be calibrated and traceable to a recognized national standard. Contractor shall provide to KenGen the calibration certificates.

5.1.9 As a minimum the following test equipment shall be available during the testing:

i. Virtual test function or simulator to test and check the process.
ii. Test equipment to generate and check signals to/from system.
iii. Hardware and software engineers to support testing activities for the duration of FAT.

5.1.10 Inadequate performance of system and/or a large number of errors at the factory test may result in KenGen's decision to postpone/restart system test. Any such additional testing shall be performed by Contractor at no additional cost to KenGen.

5.1.11 KenGen shall retain all rights to reject the system if Contractor is not able to satisfy the specification of the project.

5.1.12 Schedule of all hardware shipment will be done upon the KenGen approval after all items of FAT have been tested and verified by KenGen.

5.1.13 Contractor shall provide test records to log all discrepancies found during the FAT activities for hardware and software. This record can be classified for additional or modification requirement requested by KenGen and deviation caused by Contractor which does not meet KenGen specifications. The test records shall be available at site during construction.

5.1.14 Testing shall be done in the presence of witnesses from KenGen and shall include but not limited to the following:

i. Visual inspection
ii. System configuration loading
iii. Servers, PLC, Local HMI, Firewalls and Operator workstations
iv. System diagnostics features
v. System and process alarms display
vi. System and process event logging.
vii. Check formats, reports, prints, etc.
viii. Check on symbols used, groups, titles, messages and descriptors
ix. Check on static part of custom graphic displays for consistency and color
x. Check each analog input at 0%, 25%, 50%, 75% and 100% of full-scale values and check data accuracy and values on corresponding groups, graphics and other displays.
xi. Engineering unit conversion and scaling parameter
xii. Check binary (digital) input status in the both the 'ON' and 'OFF' status on corresponding groups, graphics and other displays.

xiii. Check each analog output at 0%, 50% and 100% of full-scale values from operator console and check the values on corresponding groups, graphics and other displays.
xiv. Check binary (digital) output status in the both the 'ON' and 'OFF' status from operator console on corresponding groups, graphics and other displays.
xv. Third party device communication verification.
xvi. Check Servers and communication load.

5.1.15 Any failure during test(s) shall be corrected and the relevant test(s) shall be repeated entirely. The total system shall operate continuously under load without failure for a minimum period of 72 hours prior to shipment.

5.1.16 Contractor shall submit to KenGen (Buyer), all test results report for the FAT. The equipment shall not be shipped to the field until Buyer approves the results of the test.

5.2 SITE ACCEPTANCE TEST (SAT)

5.2.1 SAT shall be conducted only after completing of the following activities:

i. FAT completion.
ii. Delivery of entire system to field and installation.
iii. Installation of entire system.
iv. Connection and power-up of the system by Contractor

5.2.2 SAT shall be carried out according to a SAT procedure written by Contractor and approved by KenGen prior to execution of the SAT. If necessary, some FAT activity shall be repeated during the SAT.

5.2.3 SAT shall include part of FAT that could not be tested satisfactorily during FAT.

5.2.4 Contractor shall give at least four (4) weeks' notice to KenGen prior to SAT start date.

5.2.5 SAT shall be thoroughly and completely documented so that at the conclusion of SAT, a complete record of each test and the results of each test are available.

5.2.6 Contractor shall prepare formal certificates for SAT that shall be signed jointly by KenGen and Contractor on successful completion of each test.

5.2.7 Following successful commissioning of the unit under test, the client shall issue a Take-Over Certificate following the takeover of the unit for commercial operation. Where the commercial operation may be delayed due to reasons other than contractor's obligations, the unit shall be deemed to have been taken over the day following successful commissioning of the unit.

5.2.8 There shall be defects liability period of 12 months from the date of commissioning of the redundant server HMI system.

5.2.9 During the defect's liability period, the client shall report the defects recorded to the contractor. The contractor shall carry out works to remedy the defects reported.

5.2.10 At the expiry of the DLP, the client shall issue a DLP certificate indicating successful resolution of reported defects.

6 TRAINING

6.1 Scope On Training

6.1.1 The contractor shall offer training to client's staff to impart knowledge and skills adequate for trained staff to carry out effective maintenance, configuration and modification of PLC programs, local and server HMI software and Operator Workstation graphics/screens of the installed systems. The proposed training shall be offered in three stages namely: Factory training, Factory On-The-Job training and Site Training.

6.1.2 While undergoing training at the contractor's country, the contractor shall meet the following costs related to the client's staff:

i. Travel cost from the nearest airport to the hotel/residence (and return journey at the time of departure) of the client's staff.
ii. Daily shuttling from hotel/residence to training location and back to hotel/residence.
iii. Hospitality during the training days/sessions at the training centers.

6.1.3 The client shall cater for the expenses incurred by the client's staff, during factory and on-the-job training, including the hotel accommodation expenses and travel expenses up to the airport nearest to the contractor's premises/factory. Travel expenses include VISA fees, return air flights among others.

6.1.4 The training content for the factory and site training shall be submitted by the contractor for review and approval by the client two (2) months before the proposed training dates.

6.2 Factory Training

6.2.1 This shall be classroom training for seven (7) client's staff with four (4) staff undertaking training on PLCs and three (3) engineers undertaking training on HMI & industrial communication and networking.

6.2.2 On controllers, the training content shall include creating new projects, developing functional blocks and programs, use of contractor scrips and in-house developed programs/tools for database management, configuration, addition and/or removal of controller cards, debugging, testing and commissioning of the controller program.

6.2.3 On HMI the content shall include creating new projects, developing operator displays/screens, configuration and development of the variables database from PLC signal list, development and editing of historian, alarm list, event list and trends, configuration of OLE server, etc.

6.2.4 On industrial communication the content shall include process control communication, OPC server configurations and substation control communication.

6.2.5 The classroom training shall be for a duration of ten (10) working days, exclusive of weekends & public holiday or such events that may be held in the country of the contractor during the training period.

6.3 Factory On-The-Job Training

6.3.1 Following the classroom training of client's staff, the trained staff shall undergo on-the-job training at the contractor's offices/factory.

6.3.2 The client's staff shall be involved in the development of the PLC programs and HMI graphics/displays specified in this tender document. The contractor shall ensure that staff develop programs (or part thereof) that will be running in the controllers and in the HMI for the proposed project.

6.3.3 The assignments shall be guided and supervised by the contractor staff.

6.3.4 The factory on-the-job training shall be for a duration of ten (10) working days, exclusive of weekends & public holiday or such events that may be held in the country of the contractor during the training period.

6.4 On - Site Training

6.4.1 There shall be site training for twenty (20) of client's staff. The training shall be in two groups of ten (10) staff each. The training duration shall be for five (5) days for each group at a client facility.

6.4.2 The client shall provide flips charts, white boards, markers, projector and writing materials for the trainees. The contractor/trainers shall provide training materials sufficient for the staff attending the training.

6.4.3 The training shall be offered by contractor's staff.

6.4.4 The training content shall at a minimum cover

a. For technical staff- DCS HMI and PLC introduction, DCS architecture, hardware configuration, navigation through the programming application, basic programming, program modification, program back up and troubleshooting, Basic HMI application setup, configuration, database development from PLC signal list, graphics development and variables configuration. OPC server application configuration including substation control communication configuration at the server applications.

b. For operational staff- DCS General architecture, Workstation and Local HMI operator log in, navigation through the graphics of all engine systems, engine graphics/mimics for start conditions, trip conditions, Engine operations at the new Server HMI system right from the start preparation, starting, running, stopping sequences. Changing of operational control setpoints. Operation from both the Operator workstations and the Local HMI at the local control panel.

7 SITE TESTING AND COMMISSIONING

7.1.1 The tests and commissioning will be performed according to standard test procedures.

7.1.2 The Contractor's Engineers shall familiarize the client's engineer in such disciplines as;

i. Step by step procedure in pre-commissioning and commissioning of the equipment into operation.

ii. Signal tests (joint tests between contractor and KenGen) shall be performed to prove that all the field signals in PLC and HMI work correctly. The simulations will be done from the field and observed at both Operator workstation and the Server.

iii. Tests of all project programs (indications, displayed quantities, analogue outputs, etc.) to show such items are within the accuracy limits specified.

iv. The Tests on Completion shall include the following:

a. HMI: At least three starts and stops from the server HMI system.
b. PLC: failure in sequence shall be performed

8 TAKING OVER CERTIFICATE

8.1.1 On satisfactory completion of the tests, the client shall issue a Taking Over Certificate. This shall show the effective date of taking over which shall be the date of commencement of the 12 months Defects Liability Period.

9 WARRANTY

9.1.1 The Supplier warrants that the Goods supplied under the Contract are new and unused. The Supplier further warrants that all Goods supplied under this Contract shall have no defect, arising from design, materials, workmanship, or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions prevailing in the country.

9.1.2 This warranty shall remain valid for twenty-four (24) months after the goods, or any portion thereof as the case may be, have been delivered and accepted by the client.

9.1.3 It is a condition of this contract that all malfunctioning items during the warranty period shall be replaced by the Contractor at his own cost.

10 SYSTEM COPYRIGHTS

10.1.1 Upon successful completion of the project, the client shall not be limited in any way to use and access system data and applications in its other control environments as and when required.

11 INSPECTION

11.1.1 All consignments subject to Pre-Export Verification of Conformity (PVoC) to Standards Programme must obtain a Certificate of Conformity (CoC) issued by PvoC Country Offices Prior to shipment.

11.1.2 The Certificate is a mandatory Customs Clearance document in Kenya; Consignments arriving at Kenyan Ports without this document will be denied entry into the Country. Since PVoC is a conformity assessment process to verify that products imported to Kenya are in compliance with the applicable Kenya standards or approved equivalents, regulations and technical requirements before shipment, it is the sole responsibility of the supplier (i.e. exporter) to demonstrate the same and hence meet any associated costs of verification.

12 SPARE PARTS

12.1 All the remaining Commissioning Spare Parts at the conclusion of the project shall be handed over to KenGen free of charge.

12.2 The contractor shall supply and handover the spare parts listed in schedule III of schedule of requirements herein. These spares shall form part of the total price for the bid.

12.3 The contractor shall also provide a priced list of recommended 2 years spare parts as part of the proposal in the bid. This list shall not be part of the total price for the bid but only for information to the client on the strategic spares to keep.

13 TECHNICAL SCHEDULE

The tenderer shall duly fill the technical schedule to outline the specifications of the offer for the plant control DCS HMI upgrade at Kipevu III Diesel Power Plant. Any deviation of his offer must also be indicated in the table. ***The table filling is mandatory and any bid with unfilled evaluation table below shall be considered as none-responsive***.

CLAUSE NO.	DESCRIPTION	COMPLIANCE
1.2	**GENERAL SCOPE OF WORK FOR HMI, PLC**	
1.2.1	Design/engineering of a new DCS HMI for the plant as per the proposed architecture and tender specifications. This shall include design, assembly and supply of two(2) new 42U server cabinet fully installed with ; two (2) redundant industrial server, one (1)KVM switch, one(1) time server, two (2) ethernet switches, one(1)firewall ,five(5) industrial operator stations, one(1) plant information station.	
1.2.2	Design/engineering of of one (1) engine's PLC system as per the proposed architecture and tender specifications. This shall include design, assembly and supply of new PLCs and its associated local and remote IO modules and associated accessories. The existing control cabinets CFE, CFC and BJA shall be retained.	
1.2.3	The contractor shall design, integrate, install, test and commission the GIS HMI (ABB Micro SCADA) functionalities in the new DCS HMI at the Kipevu 3 control room.	
1.2.4	One (1) Panel Mount Compact industrial PC with 19" Display shall be fitted on a new Local Control Panel at the Engine Upper Floor.	
1.2.5	General arrangement drawings of equipment proposed by the vendor shall be approved by KenGen before fabrication.	
1.2.6	Statutory pre-shipment inspection, shipment, customs clearance, insurance and storage of the system before installation and delivery to the site.	
1.2.7	Tag identification of all signals from field before removal of existing one (1) engine PLC and the DCS HMI.	
1.2.8	Removal of existing PLC control System for the first (one) engine which includes components in CFC, CFE and BJA panels.	
1.2.9	Vendor shall make a DCS HMI and PLC backups of existing system configuration for system engineering and connectivity.	

1.2.10	All recovered PLC modules and associated accessories shall be handed over to KenGen.	
1.2.11	Erection, installation, site acceptance test and commissioning of new DCS HMI and one (1) PLC for one engine along with all associated hardware, and software by the contractor.	
1.2.12	Installation, field testing, loop checking, commissioning and field acceptance of the system.	
1.2.13	Installation and commissioning assistance of free issue items if any (owner supplied).	
1.2.14	Vendor shall submit the BOM & price schedule with itemized price break-down including mandatory spares and recommended two (2) year spares for smooth running of the system.	
1.2.15	Vendor shall provide two (2) complete sets of digital video disks (DVD) back-up configuration storage for each system, containing operating programs, diagnostic programs, system configuration, etc.	
1.2.16	Factory Acceptance Testing, on-the-job training and site acceptance testing of new DCS HMI and one (1) engine PLC system.	
1.2.17	Site training for client staff following successful commissioning of the project.	
1.2.18	Preparation of project documentation – design for approval, assembly and as-built-drawings, commissioning records, including operation and maintenance manuals, OEM manuals among other documentation that may be necessary.	
1.2.19	All PCs provided as part of this project shall be equipped with the latest available processor with maximum processing speed.	
1.2.20	The contractor shall provide all required tools for the site works at his cost.	
1.2.21	Provision of personnel, expertise, tools, equipment, temporary facilities and consumables required for this purpose shall be part of the Contractor's responsibility.	
1.2.22	Development of suitable and acceptable work program to have minimum effect on the availability of the plant (minimum plant downtime due to the replacement works and commissioning).	
1.2.23	All reasonable precautions shall be taken in the design of equipment to ensure safety of personnel concerned with the operation and maintenance of the equipment.	
1.2.24	The DCS HMI system shall be designed in a server client concept where all the operator stations shall draw and send plant commands through the server.	
1.2.25	The server shall thus be able to communicate with all the PLCs via a suitable modern industrial communication protocol. A high availability system is recommended especially at the server end. A redundant server system is recommended with a failover configured to mitigate any data loss.	
1.2.26	The redundant server system shall also serve as virtual historians for the control data and events.	
1.2.27	The System profiles shall be in such a way that authorized users will execute functions according to their specific profile capabilities (Define different user profiles).	

1.2.28	The server Operating system shall be Windows Server 2019 or newer, while the operator stations will run on Windows 11 or the latest.	
1.2.29	A 2N UPS system, adequately sized with minimum spare capacity of 40% and autonomy of 2 hours, shall be provided by the contractor for power supply to the server cabinet equipment and operator workstations.	
1.2.30	The two servers shall be in hot standby redundant mode. These servers shall also act as standard Network Time Protocol server for the rest of devices in the LAN (NTP clients). In the event of server failure, the thick clients (Operator work stations) shall continue with plant operation.	
1.2.31	The contractor shall supply a GPS system (LANTIME M300, Meinberg or equivalent) that can support Ethernet interface to the servers and the entire network.	
1.2.32	Supply and lay power and signal cables from the server system to the control network and all server clients and any other device (the proposed server location at the Kipevu III central control room). Bidders to confirm location during site visit.	
1.2.33	The contractor shall be responsible for gathering required data and information necessary for the execution of this project.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
1.4	**QUALIFICATION OF THE CONTRACTOR**	
1.4.1	The Contractor shall either be the OEM of the offered DCS HMI or a System Integrator shall submit a letter of support from the OEM for performance guarantee.	
1.4.2	The contractor shall further provide proof of support and commitment to execute the project (design, engineering, Factory Acceptance Test-FAT and commissioning). Hence the contractor is required to get the project fully engineered and factory tested at OEM's factory witnessed by the buyer's representative(s) – the test factory must be fully owned by the OEM.	
1.4.3	The contractor to execute the project (design, engineering, Factory Acceptance Test-FAT, Installation, and commissioning) shall meet the following minimum requirements:	
	a) Must have successfully executed at least two (2) PLC projects for large power generation plants in the last ten (10) years – Attach evidence	
	b) Must have successfully executed at least two (2) Server based HMI projects for large power generation plants in the last ten (10) years – Attach evidence	
	c) Must have successfully executed at least two (2) HV substation SCADA projects for large power generation plants in the last ten (10) years – Attach evidence	
	d) Shall be fully owned by the principal (OEM) or if a System Integrator shall submit a letter of support from the OEM for performance guarantee – Bidder must attach evidence.	
1.4.4	Site visit, at the vendor's cost, to KenGen Kipevu 3 Diesel Plant to evaluate the job to be undertaken before submitting the offer is mandatory – No offer shall be considered for technical evaluation in absence of this activity.	

1.4.5	Contractor team shall be at a minimum have a project manager who has at least ten (10) years of experience in handling distributed control and automation projects and a Commissioning engineer with at least 10 years' experience in commissioning of distributed control and automation systems.	
1.4.6	The Curriculum Vitae (CVs) of the project manager and the commissioning engineer shall be attached as a minimum for the contractor's team.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
2	**DETAILED SCOPE OF WORK**	
2.1	**HMI**	
2.1.1	Design, supply, install, test and commission two (2) servers system configured in redundant mode as per given specifications. One server shall be primary while the other one work as a hot standby server.	
2.1.2	Both servers shall be able to fetch data from PLCs and other hardware independently. Similarly, the operator stations shall be able to fetch data from servers. Redundancy shall be provided for servers. i.e. if the primary server fails, the operator stations shall fetch data from the active server.	
2.1.3	A total failure of both servers shall not affect the communication, monitoring, control and supervision of the PLCs by the operator work stations.	
2.1.4	The servers shall be installed with HMI applications and the necessary one-off licenses for operation and control of the seven engines and associated power plant auxiliaries.	
2.1.5	The operator work stations shall be installed with HMI applications and the necessary one-off licenses for operation and control of the seven engines and associated power plant auxiliaries.	
2.1.6	The license keys shall be a dongle license.	
2.1.7	The contractor shall supply an Engineering workstation (EWS)-laptop, tested and commissioned fully installed with the DCS HMI application.	
2.1.8	The DCS HMI software development version license shall be a USB dongle license with a minimum of sixty thousand (60,000) tags.	
2.1.9	The Engineering workstation (EWS) shall also be installed with latest version of a licensed PLC programming software.	
2.1.10	The Engineering workstation (EWS) shall also be equipped with all necessary one-off licenses for the HMI and PLC data/variables management tools at development level of the applications. The client engineers/technicians shall have the engineer's access level necessary to improve/modify the HMI graphics, database and PLC programs if need be.	
2.1.11	HMI application shall have inbuilt functionality to support Hot redundant server architecture.	
2.1.12	Redundant server architecture will have support for redundancy in Data acquisition, Trending, Alarming and Event triggering.	
2.1.13	The Contractor shall provide and install the necessary OPC server applications to enable future external Plant information interfaces through the firewall.	
2.1.14	The server system shall be accessed via five (5) thick client operator workstations and one (1) plant information workstation in a fully	

	assembled 42U cabinet.	
2.1.15	The operator workstation monitors shall be connected to their respective PCs via KVM extenders.	
2.1.16	The servers shall be supplied in a fully assembled 42U cabinet.	
2.1.17	The contractor shall provide to Client for approval design architecture proposal together with technical specifications of the proposed hardware and software.	
2.1.18	There shall be a Factory Acceptance Test (FAT) at the OEM premises as prescribed in the tender document.	
2.1.19	There shall be a Site Acceptance Test (SAT) as prescribed in the tender document.	
2.1.20	The contractor shall design, develop and interface HMI graphics for the effective, efficient and safe operation and control of the seven (7) engines and other power plant auxiliaries which shall at least be as per the existing HMI graphics.	
2.1.21	The contractor shall design, integrate, install, test and commission the GIS HMI (ABB MicroSCADA) functionalities in the new DCS HMI at the Kipevu 3 control room.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
2.2	**SCADA Data Gateway**	
2.2.1	The contractor shall supply a SCADA gateway as per specifications in this tender document.	
2.2.2	The SCADA Data Gateway shall act as an OPC to IEC61850 server for the purposes of supervision, control and data acquisition of the GIS substation for the new DCS HMI stations at the Central Control Room.	
2.2.3	It shall also act as protocol converter (OPC to IEC 60870-5-104) for communication of Medium Voltage equipment data to the ABB RTU560 through the IEC 60870-5-104 protocol over the GIS ethernet network.	
2.2.4	The SDADA Gateway shall be mounted at the existing RTU cabinet M 75 at the GIS House.	
2.2.5	The power supply source shall be provided by the client at 110VDC at BEY911/912 panel at the GIS House. The approximate distance between the BEY911/912 panels and RTU cabinet (M +75) is 10 metres.	
2.2.6	Any power distribution or communication accessories needed for achieving the supervision, control and data acquisition for the GIS IEDs and ABB RTU560 shall be determined and provided by the contractor.	
2.2.7	The contractor shall configure the gateway for supervision, control and data acquisition for all the GIS Inteligent Electronic Devices (IEDs) i.e all RET615, all RED615, all REF545 and REB670 from the new DCS HMI at the Central Control Room. This shall be achieved through IEC61850 communication protocol.	
2.2.8	The configuration, testing and commissioning of the supervision, control and data acquisition for the GIS IEDs shall not result to any substation downtime.	
2.2.9	The contractor shall be liable for any malfunctioning any GIS IEDS resulting from any works during the execution of the project.	

2.2.10	The contractor shall configure the gateway for telecommunication with the ABB RTU560 for all Plant Medium Voltage Equipment data as per existing signal list through IEC 60870-5-104. The Signal list shall be provided by the client.	
2.2.11	Any reconfiguration of the ABB RTU560 as may be required for the purpose of achieving the existing functionalities shall be the responsibility of the contractor.	
2.2.12	The contractor shall be liable for any malfunctioning of the ABB RTU560 resulting from any works during the execution of the project.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
2.3	**LOCAL HMI DISPLAY**	
2.3.1	The contractor shall supply a panel mount industrial PC with 19" LCD display with touch function for Local HMI.	
2.3.2	The operation and monitoring functions of the specific Diesel Generator in the Local HMI shall be realized by applying the same HMI application as the one employed for the redundant server system.	
2.3.3	The Local HMI thick client application shall be fully licensed. The license shall be an one -off type on a USB dongle.	
2.3.4	The Contractor shall supply and install the control panel for installation of the panel mount industrial PC with 19" Display as per specifications in this tender document.	
2.3.5	The Panel Mount Industrial PC shall be a thick client to the PLC system. It shall be able to execute all control, monitor and supervise the specific engine systems.	
2.3.6	It shall be able to communicate with the engine PLC without the server connections. The local HMI shall be able to query engine-wise event list and logging from the redundant server system.	
2.3.7	In the event of loss of communication with the server, the Local HMI shall be able to continue monitoring and controlling its specific engine uninterrupted. Only the event list and plant history shall not be accessible from the Local HMI during any server connection interruption.	
2.3.8	The Local HMI shall be connected to the PLC (CFC panel) hot standby system through a fiber link.	
2.3.9	The contractor shall supply, install and commission the necessary power supplies items and accessories for the complete installation of the Local HMI control panel. The available power supplies source is a 110VDC at CFE control panel approximately 5 meters away (the contractor shall be responsible for confirmation of the actual length on site).	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
2.4	**CONTROLLER**	
2.4.1	The contractor shall Design, supply, install, test and commission a Hot standby PLC system for one (1) engine.	
2.4.2	The contractor shall provide to Client for approval design architecture proposal together with technical specifications of the proposed hardware and software.	

2.4.3	There shall be a Factory Acceptance Test (FAT) at the OEM premises as prescribed in this tender document.	
2.4.4	There shall be a Site Acceptance Test (SAT) as prescribed in this tender document.	
2.4.5	The contactor shall involve the client in the upgrade design and review of the hot standby PLC system hardware and software.	
2.4.6	The contractor shall extract the control program using a licensed software tool from the existing Controller i.e 140CPU67160 and create a backup.	
2.4.7	The contractor shall carefully remove existing PLC system hardware which includes;	
	a. At CFC Panel- Two (2) Hot stand by Controllers complete with its associated backplanes and one (1) Rack of local input/output modules except the input/output prefabricated terminal blocks.	
	b. At CFE Panel- Three (3) remote input/output Racks complete with its associated modules except the input/output prefabricated terminal blocks.	
	c. At BJA Panel- One (1) remote input/output Racks complete with its associated modules except the input/output prefabricated terminal blocks.	
	d. All coaxial communications links and accessories connecting the CFC, CFE and BJA panels.	
2.4.8	The contractor shall document and handover all the recovered PLC hardware and associated accessories to the Client upon removal.	
2.4.9	The contractor shall install the new Hot Standby PLC system, download the extracted back up PLC program, test and commission the system as per approved Site Acceptance Test procedures.	
2.4.10	The following additional communication cards shall be installed that includes:	
	a. RS 485/232 module	
2.4.11	The contractor shall install fibre communication links between CFE and CFC. Suitable media converters to be installed.	
2.4.12	The contractor shall be expected to use the existing cable routes and cable management infrastructures.	
2.4.13	The contractor shall train the client staff in accordance with the prescribed training syllabus in this tender document.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3	**DETAILED TECHNICAL SPECIFICATIONS**	
3.1	HMI SOFTWARE APPLICATION	
	As per clauses 3.1.1 to 3.1.33	
3.2 3.3 3.4	HMI SCREEN FEATURES	
	As per clauses 3.2.1.1 to 3.4.1.57	
3.5	HOST SERVERS' SPECIFICATIONS	
3.5.1	General requirements	
3.5.1.1	A total of two (2) industrial host servers shall be supplied and installed in a 42U server cabinet.	

3.5.1.2	Servers shall be assembled into the cabinet by the contractor and shall be delivered to site in a completely assembled cabinet. All devices, components and accessories required to assemble the servers into the cabinet shall be supplied by the contractor irrespective of whether they are stated in the schedules or not.	
3.5.1.3	Servers offered shall be complete with all hardware components, accessories, features and devices necessary for a complete functional rack mounted server computer irrespective of whether these features have been specified in these schedules or not.	
3.5.1.4	The servers supplied will be used by the client to operate Distributed control systems for a power plant	
3.5.1.5	The servers shall execute PLC time-stamped communication protocol variable frames. The active server enables communication to PLC variables frames for:	
3.5.1.6	Use of the high availability Ethernet LAN in order to periodically scan active redundant PLC controller at each generation unit, and also active redundant PLC for auxiliary services (COMMON PLC), obtaining time-stamped updates for analog and digital signals.	
3.5.1.7	Reporting analog and digital updates from PLC System software.	
3.5.1.8	Receiving command actions (set points and digital commands) and translate them into write orders for the appropriate active PLC redundant controller through the High Availability Ethernet LAN.	
3.5.1.9	Active Server shall update any received value expressed in engineering units, in its RAM real-time DCS database variables. All variables can be configured inside a hot-standby redundancy association, so that any value update can also be transmitted to the redundant server through the High Availability Ethernet LAN.	
3.5.1.10	Active Server updates any received value to Operator Stations through local high availability LAN.	
3.5.1.11	The Servers shall also make data processing according to their configuration as highlighted below.	
3.5.1.12	The Servers shall maintain detected-alarm lists that also are replicated to local Operator Stations and any acknowledgement action at any Operator Station is replicated to any redundant Process-Data server and other Operator Stations.	
3.5.1.13	The Servers shall locally log historical alarm registers in proprietary format so that active server can provide historical alarm records to Local Operator Stations.	
3.5.1.14	The Servers shall locally log FIFO historical variable value changes so that Operator Stations can present historical trend graphs of recorded variables from the active server.	
3.5.1.15	The Servers shall perform OPC Server functions in order to provide redundant data sources for Plant Information's OPC Interface.	
3.5.1.16	The offered servers shall be industrial grade designed for 24/7 operation at the following environmental conditions:	
3.5.1.17	Temperature: 0 to 60°C (continuous)	
3.5.1.18	Altitude: Sea level	
3.5.1.19	Installation location: indoor with natural aeration only.	

3.5.1.20	The Servers shall meet a minimum specifications as per clause 3.5.1.20 in this tender document	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.5.2	**Host Servers Operating systems Requirements**	
3.5.2.1	Contractor shall install all operating systems as virtual machines as detailed in the proceeding clauses. The virtual machines shall be installed, configured and tested prior to factory acceptance tests by the procuring entity.	
3.5.2.2	Software licenses referred in the scope of supply shall all be supplied and installed into the servers even for those not detailed in this particular specification.	
3.5.2.3	The operating systems/ virtual machines shall run HMI Application softwares for operation of critical power systems. The Contractor shall ensure when configuring the servers the highest reliability of the power systems configured.	
3.5.2.4	Windows software installed into the host servers shall be configured with the optimal settings and services for an industrial control system use.	
3.5.2.5	Contractor shall train the procuring entity extensively on virtualization, operating systems installation and configuration, Windows server services and applications configuration and all other items as detailed in this tender.	
3.5.2.6	Contractor shall fully involve the procuring entity during installation and commissioning of the server system. Contractor's personnel shall be physically present onsite with the procuring entity personnel for this exercise.	
3.5.3	**Host Servers Virtualization Requirements**	
3.5.3.1	The host server shall be a virtual machine container, to host the client's HMI application softwares and other applications. The fundamental aim of the virtualization shall be to allow back up and transfer of all server software and data to another hardware host machine in case of hardware failure with minimal or no changes to the applications.	
3.5.3.2	Each server shall contain latest Enterprise VMware vSphere (ESXi) native (bare metal) Hypervisor operating system installed. The VMware hypervisor shall support all Microsoft windows operating systems from windows server 2019 to windows 8.1.	
3.5.3.3	Each host server shall contain a minimum of two Virtual Machines of Standard Windows server 2019 installed on the VMware Hypervisor.	
3.5.3.4	Virtual machines shall be hardware independent; i.e. in case of Hypervisor machine hardware change, the virtual machines shall have to work with the same base features, with no specialist support for the substitution.	
3.5.3.5	Virtualization and installation of VM's in all the servers, setting up of the virtualization management client and the associated virtualization set up shall be carried out by the contractor.	
3.5.3.6	vCenter server shall be installed to two host servers for virtual machines monitoring and management.	
3.5.3.7	vMotion server shall be installed in the host servers for zero downtime migration.	

3.5.3.8	Contractor shall carry out all necessary configuration and provide any required applications required for regular back up of all VM's.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.5.4	**Hypervisor Minimum Requirements**	
3.5.4.1	X-based operating system (Unix/Linux).	
3.5.4.2	Remote control, management and configuration capability of the hardware machine and all its virtual machines without mouse, keyboard and monitor direct connections (hypervisor remote control).	
3.5.4.3	NTP time synchronization client: the time synchronization shall be transferred to its own virtual machines.	
3.5.4.4	Native RAID5 management capability.	
3.5.4.5	All the connected network cards may be directly connected to one of its virtual machines with no virtual driver interposition ("hardware pass-through").	
3.5.4.6	From the operating point of view, all the running Virtual Machines shall have to be seen as physical computers in the network, even if they are VMs.	
3.5.5	**Virtualisation Software Requirements**	
3.5.5.1	A minimum of two (2) 64-bit VMware vSphere essential plus with perpetual licenses shall be supplied and utilised to virtualise all the Host servers in scope of supply	
3.5.5.2	VMware vSphere shall have a minimum features and functions as per clause 3.5.5.2	
3.5.5.3	Two (2) vCenter essentials plus (or higher) servers shall be installed into the two host servers' windows 2019 server virtual machines, for virtual environment monitoring and management. Supplier shall configure, test and commission the vCenter functions as per clause 3.5.5.3	
3.5.5.4	Two (2) year basic software VMware vSphere and all other applications support shall be provided.	
3.5.5.5	Two (2) years manufacturer warranty period on hardware. Warranty certificate required.	
3.5.5.6	Include Service Level Agreement for support.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.6	**SCADA DATA GATEWAY TECHNICAL SPECIFICATIONS**	
3.6.1	The SCADA Data gateway shall have minimum specifications as per clause 3.6.1	
3.6	**OPERATOR STATIONS SPECIFICATIONS**	
3.6.1	General requirements	
3.7.1.1	The offered workstations shall be industrialgrade designed for 24/7 operation at the following environmental conditions:	
	a. Temperature: 0 to 60°C (continuous)	
	b. Altitude: sea level	
	c. Installation location: indoor with natural aeration only	

3.7.1.2	Total of Five (5) Operator Workstations and One (1) Plant Information Workstation shall be provided. These workstations shall be used for the monitoring and control of the seven engines and associated plant auxiliaries.	
3.7.1.3	The operator workstations shall be the latest industrial grade PC from a reliable and proven manufacturer. The performance and specification for these workstations shall meet the intended purposes.	
3.7.1.4	Where dual screens are specified, only one keyboard and pointing facility will be required to access both screens.	
3.7.1.5	Each operator workstation shall be powered from a redundant power supply arrangement and shall also have redundant network connections to each of the networks to which it is connected.	
3.7.1.6	The screen display units shall be as a minimum 22" diagonal LCD screens with high resolution graphics (minimum 1600 x 1200 pixels), with minimum 8 control increment /decrement key built-in with optical mouse. The screen shall be flicker-free and glare-free complete with standard screen controls such as brightness, etc., accessible to the operator.	
3.7.1.7	Workstations shall meet the minimum specifications as per clause 3.7.1.7	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.8	**PLC SPECIFICATIONS, M580 Hot standby redundant CPU**	
	As per clause 3.8.1.1 to 3.8.1.37	
3.9	**PROCESS I/O MODULES AND SIGNAL SPECIFICATIONS**	
	As per clause 3.9.1 to 3.9.3	
3.9.4	**SIGNAL QUANTITIES:**	
3.9.4.1	The supplied redundant server based HMI system shall be able to accommodate all the existing signals (Plant PLCs and ABB RTU560).The existing signals list will be provided as and when needed.	
3.9.4.2	All existing plant PLCs and ABB RTU560/ABB MicroSCADA shall not be considered as additional signals.	
3.9.4.3	The contractor shall be responsible for confirming the actual signal list quantity and accuracy of the list.	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.10	**ENGINEERING WORK STATION (EWS)**	
3.10.1	General requirements	
3.10.1.1	The HMI system shall have a laptop as an engineering station at the Control room to connect to the HMI application through the control network ethernet switches. The engineering station shall perform the following functions as a minimum;	
	a. Control system configuration.	
	b. Creation and modification of control logic for the HMI softwares and applications at the servers.	
	c. Creation of graphics for rendering on an Operator Station (OPS) and Local HMI.	
	d. Configuration of OPS functions in the server and local HMI.	

3.10.1.2	Concurrent engineering shall be possible to allow several people sharing a single engineering database on the network. Alternatively, engineering database created on the separate PCs can be merged. The objective of concurrent engineering is to make system generation and maintenance functions working efficiently so that engineering costs can be reduced.	
3.10.1.3	The operation and control functions can be simulated on a EWS PC using virtual test function. Actual controller's hardware are not required, application tests can be performed on an engineering work station (EWS) and verified without any impact on the actual plant operation. User can perform tests to validate each program segment immediately after a user completes it, if the user needs.	
3.10.1.4	The contractor shall supply an Engineering workstation (EWS)-laptop, tested and commissioned fully installed with the licensed Human Machine Interface (HMI) software development version and the controller (PLC) licensed programming software.	
3.10.1.5	The Engineering workstation (EWS) shall also be equipped with all necessary one-off licenses for the HMI (server HMI and Local HMI software) and PLC data/variables management tools at development level of the applications.	
3.10.1.6	The client engineers/technicians shall have the engineer's access level necessary to improve/modify the HMI graphics, database and PLC programs if need be	
3.10.1.7	The engineering workstation in addition shall provide all of the engineering tools to configure the system database necessary for operation, monitoring, control and maintenance.	
3.10.1.8	It shall include an alpha/numeric keyboard and any other enhanced hardware features as may be required by the system VENDOR.	
3.10.2	**EWS Minimum requirements.**	
3.10.2.1	The engineering station shall meet the minimum specifications as per clause 3.10.2.1	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**
3.11	**INDUSTRIAL ETHERNET SWITCHES**	
3.11.1.1	Two (2) rack mount forty-eight (48) port industrial ethernet switch meeting requirements in particular specifications shall be mounted in the server cabinets.	
3.11.1.2	Each ethernet switch shall be preinstalled with licensed software and preconfigured to suit the approved Network architecture.	
3.11.1.3	All devices and components required to assemble the switches into the cabinet shall be supplied by the contractor irrespective of whether they are stated in the specifications or not.	
3.11.1.4	Ethernet switch shall have minimum features as per clause 3.10.1.4	
3.12	**NETWORKING ACCESSORIES**	
	As a minimum, the contractor shall provide the networking accessories and any other materials irrespective of whether they are stated in the specifications or not as per clause 3.11.1.1	
3.13	**KVM CONSOLE WITH SWITCH**	

3.13.1	General requirements	
3.13.1.1	Shall consist of an Integrated KVM console with:	
	a. Integrated retractable 19" LED-backlit LCD monitor.	
	b. 8-port KVM switch.	
	c. Illuminated keyboard and touch pad	
	d. Dual Rail housing	
3.13.1.2	Physically the console shall consist of four main parts: Keyboard module, LCD monitor, rear KVM switch and Rack mounting devices/accessories.	
3.13.1.3	The Rail system shall allow the keyboard/touchpad and mouse to be pushed back into the housing and out of the way when not in use.	
3.13.1.4	The LCD screen shall be rack mounted non retractable for convenient monitoring of server operation.	
3.13.1.5	Console shall support remote KVM over IP access through Ethernet. It shall have an ethernet port.	
3.13.1.6	KVM switch shall support multi user access via IP and locally via a secondary console.	
3.13.1.7	Console shall be connected to the servers via KVM adapter cables designed to connect to the host computer USB and video port.	
3.13.1.8	KVM cable shall consist of space-saving RJ-45 connectors on the console side and Cat 5e/6/7 cabling.	
3.13.1.9	The Console shall use a secondary console port to allow access of computers connected to the LCD KVM switch from an external console.	
3.13.1.10	Console keyboard module shall consist of the standard 105 key keyboard, touch pad, KVM port selection buttons & power and other status indication LED's and a front facing USB port Supporting an external USB mouse.	
3.13.1.11	Keyboard shall have LED illumination light to illuminate the keyboard and touchpad to allow visibility in lowlight conditions.	
3.13.1.12	Console shall have a port for firmware updates.	
3.13.1.13	Console shall allow easy computer selection via pushbuttons, Hotkey Mode, OSD (On-screen Display), or Browser-based GUI.	
3.13.1.14	Shall support multiple browsers: Internet Explorer, Chrome, Firefox, Safari, Opera, Mozilla, Netscape etc.	
3.13.1.15	The KVM console mounting panels, brackets, levers and Switch casing/enclosure shall be made of steel.	
3.13.1.16	Accessories, features and devices usual and necessary for a server cabinet rack mounted KVM console and switch shall be supplied and installed by the contractor irrespective of whether they have been specified or not.	
3.13.1.17	The offered KVM console shall be enterprise grade designed for 24/7 operation at the following environmental conditions:	
	a. Temperature: 5 to 45°C (continuous)	
	b. Altitude: sea level	
	c. Installation location: indoor with natural aeration only	
3.13.2	KVM switch Minimum specifications	
3.13.2.1	KVM console shall meet the following specifications as per clause 3.13.2.1	
CLAUSE NO.	**DESCRIPTION**	**COMPLIANCE**

3.14	**SERVER CABINET**	
	As per cluase 3.14.1 to 3.14.10	
3.15	**PANEL MOUNT COMPACT INDUSTRIAL PC – NEW LOCAL CONTROL PANEL**	
3.15.1.1	One (1) Panel Mount Compact industrial PC with 19" Display shall be fitted on the new Local Control Panel at the Engine Upper Floor.	
3.15.1.2	The operation and monitoring functions of the Diesel Generator shall be realized by applying the HMI related software.	
3.15.3	The Compact Industrial PC shall meet the minimum specifications as per cluase 3.15.3	
3.16	**New Control Panel for Local HMI**	
	As per cluase 3.16.1 to 3.16.13	
3.17	**CYBER SECURITY**	
3.17.1	General Requirements	
3.17.2	Industrial Cyber security appliance/Gateway	
3.17.3	Cyber Security Software	
3.17.4	Technical Specifications cyber–Security Functions	
3.17.3.1	General requirements	
3.17.3.3	Firewall	
3.17.3.4	Intrusion Prevention System	
3.17.3.5	Anti-Bot and Anti-Virus	
3.17.3.6	Sandboxing and File Scrubbing	
3.17.3.7	Email Security (Antispam)	
3.17.3.8	Security Management	
3.17.3.9	Data Loss Prevention (DLP)	
3.17.3.10	Best Practice Governance Risk and Compliance (GRC)	
3.17.4	Enterprise Grade Cyber Security Appliance (Gateway)	
5	**TESTING AND COMMISSIONING**	
5.1	Factory Acceptance Test as per clause 5.1.1 to 5.1.16	
5.2	SITE ACCEPTANCE TEST (SAT) as per clause 5.2.1 to 5.2.10	
6	**TRAINING**	
6.1	Scope On Training	
6.2	Factory Training	
6.3	Factory On-The-Job Training	
6.4	On - Site Training	

13.1 TECHNICAL EVALUATION CRITERIA

CRITERIA No.	DESCRIPTION
1.	Compliance to technical schedule -duly filled

2.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the server based HMI application
3.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the PLC
4.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the servers
5.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the operator workstation hardware
6.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the substation control gateway hardware.
7.	Bidder either OEM or letter of support from OEM for performance guarantee; proof of support and commitment to execute project – Attach manufacturer's authorization if bidder not an OEM or manufacturer's self-declaration if bidder is OEM for the panel mount industrial PC hardware(for local HMI)
8.	OEM Lifecycle Support Letters – A letter from OEM indicating that remaining life cycle of the PLC, HMI software, Server is more than ten (10) years.
9.	Successful completion of at-least two (2) PLC,DCS HMI and HV substation SCADA projects for large power generation plants in the last ten (10) years- Attach completion certificate.
10.	Detailed work schedule showing minimum effect on availability of plant - Attach work schedule.
11.	Compliance to technical requirements as detailed in the this tender document
12.	Training – Attach training content & schedule for factory and site training.
13.	FAT, testing and commissioning procedures.
14.	Contractor engineering team- Attach CVs of project manager and commissioning engineer.
15.	Warranty 24 months after successful commissioning of the DCS.
	TOTAL

14 SCHEDULE OF REQUIREMENT FOR GOODS

SCHEDULE I
SCHEDULE FOR GOODS

No.	Description	UoM	QTY
1	Industrial Operator Workstations fully installed with licensed HMI application.	Pc	5
2	Industrial plant information workstation.	Pc	1
3	Industrial host servers complete with necessary hardware components, software,	Unit	2

	licences, accessories, features and device.		
4	M580 PLC complete with Hot standby CPUs, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1
5	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFC cabinet.	Unit	1
6	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at CFE cabinet.	Unit	3
7	Remote I/O rack with I/O modules, power supply modules, networking modules and other accessories at BJA cabinet.	Unit	1
8	19"- Compact Industrial PC Panel mount touch screen Display, fully installed with licenced HMI application (to be mounted at new local control panel at engine hall)	Unit	1
9	Engineering Workstation –Laptop equipped with all necessary one-off licenses for the HMI (server HMI and Local HMI software) and PLC data/variables management tools at development level of the applications.	Unit	1
10	42U cabinet fully installed with power supply unit and sockets, cable managers, patch panels, networking cables, cooling fans.	Unit	2
11	Un-interruptible power supply	Unit	1
12	Local control cabinet	Pc	1
13	SCADA Gateway	Pc	1
14	Rack mount Industrial Ethernet Switches	Pc	2
15	KVM console with switch	Pc	1
16	Rack mount Network Time Server	Pc	1
17	Cyber security devices-Fire wall	Pc	1
18	Networking Tools and accessories	Lot	1
19	Electrical accessories	Lot	1

15 SCHEDULE OF REQUIREMENT FOR SERVICES

SCHEDULE II
SCHEDULE FOR SERVICES

No.	Description	UoM	QTY

1	Design, Installation, testing & Commissioning of redundant server-based Plant HMI system	Au	1
2	Design, Installation, testing & Commissioning of Hot standby M580 PLC system for one Diesel engine.	Unit	1
3	On the job and class room Factory Training	Au	1
4	Site Training	Au	1

16 SCHEDULE OF REQUIREMENT FOR PARTS

SCHEDULE III
SCHEDULE FOR SPARE PARTS

No.	Description	UoM	QTY
1	Digital Input Card	pc	2
2	Digital Output Card	Pc	1
3	RTD Card	Pc	1
4	Thermocouple Card	pc	1
5	Analogue Input cards	Pc	1
6	Analogue Output cards (8-channel)	Pc	1
7	CPU (Hot standby)	Pc	1
8	Network Card (control network module)	Pc	1
9	Remote I/O Network Cards	Pc	1
10	Power Supply Units (one (1) for each type used)	Lot	1

PART 3 - CONDITIONS OF CONTRACT AND CONTRACT FORMS

SECTION VI - GENERAL CONDITIONS OF CONTRACT

1. Definitions

In the Conditions of Contract ("these Conditions"), which include Special Conditions, Parts A and B, and these General Conditions, the following words and expressions shall have the meanings stated. Words indicating persons or parties include corporations and other legal entities, except where the context requires otherwise.

a) "Contract" means the Contract Agreement entered into between the Procuring Entity and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.

b) "Contract Documents" means the documents listed in the Contract Agreement, including any amendments thereto.

c) "Contract Price" means the price payable to the Supplier as specified in the Contract Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

d) "Day" means calendar day, "month" means calendar months and "year" means calendar year.

e) "Completion" means the fulfilment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.

f) "GCC" means the General Conditions of Contract.

g) "Goods" means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Procuring Entity under the Contract.

h) "Procuring Entity" means the Procuring Entity purchasing the Goods and Related Services, as **specified in the SCC.**

i) "Related Services" means the services incidental to the supply of the goods, such as insurance, delivery, installation, commissioning, training and initial maintenance and other such obligations of the Supplier under the Contract.

j) "SCC" means the Special Conditions of Contract.

k) "Subcontractor" means any person, private or government entity, or a combination of the above, to whom any part of the Goods to be supplied or execution of any part of the Related Services is subcontracted by the Supplier.

l) "Supplier" means the person, private or government entity, or a combination of the above, whose Tender to perform the Contract has been accepted by the Procuring Entity and is named as such in the Contract Agreement.

m) **"Base Date"** means a date 30 day prior to the submission of tenders.

n) **"Laws"** means all national legislation, statutes, ordinances, and regulations and by-laws of any legally constituted public authority.

o) **"Letter of Acceptance"** means the letter of formal acceptance, signed by the contractor. Procuring Entity, including any annexed memoranda comprising agreements between and signed by both Parties.

p) **"Procuring Entity"** means the Entity named in the Special Conditions of Contract.

q) **"Project Manager"** means the person appointed by the Procuring Entity in the manner provided in GCC Sub- Clause 17.1 (Project Manager) hereof and named as such in the SCC to perform the duties delegated by the Procuring Entity.

r) **"Contractor"** means the person(s) whose Tender to perform the Contract has been accepted by the Procuring Entity and is named as Contractor in the Contract Agreement, and includes the legal successors or permitted assigns of the Contractor.

s) **"Defect Liability Period"** means the period of validity of the warranties given by the Contractor commencing at Completion of the Facilities or a part thereof, during which the Contractor is responsible for defects with respect to the Facilities (or the relevant part thereof) as provided in GCC Clause 27(Defect Liability) hereof.

t) **"Effective date" means date of contract signature by both parties.**

u) **"Contract Commencement Date" shall be date of contract signature by both parties, or such other date as may be agreed by the parties in writing.**

2. Interpretation

2.1. If the context so requires it, singular means plural and vice versa.

2.2. Incoterms

a) Unless inconsistent with any provision of the Contract**,** the meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms **specified in the SCC**.

b) The terms EXW and CIP and other similar terms, when used, shall be governed by the rules prescribed in the current edition of Incoterms specified in the **SCC** and published by the International Chamber of Commerce in Paris, France.

3. Contract Documents

Subject to the order of precedence set forth in the Contract Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory. The Contract Agreement shall be read as a whole. The documents forming the Contract shall be interpreted in the following order of priority:

a) the Contract Agreement,
b) the Letter of Acceptance,
c) the General Conditions of Contract
d) Special Conditions of Contract
e) the Form of Tender,
f) the Specifications and Schedules of the Drawings (if any), and
g) the Schedules of Requirements, Price Schedule and any other documents forming part of the Contract.

4. Fraud and Corruption

3.1 The supplier shall comply with anti-corruption laws and guidelines and the prevailing sanctions, policies and procedures as set forth in the Laws of Kenya.

3.2 The Supplier shall disclose any commissions, gratuity or fees that may have been paid or are to be paid to agents or any other person with respect to the Tendering process or execution of the Contract. The information disclosed must include at least the name and address of the agent or other party, the amount and currency, and the purpose of the commission, gratuity or fee.

4.1 Entire Agreement

4.3.1 The Contract constitutes the entire agreement between the Procuring Entity and the Supplier and supersedes all communications, negotiations and agreements (whether written or oral) of the parties with respect thereto made prior to the date of Contract.

4.2 Amendment

No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party thereto.

4.3 Non-waiver

a) Subject to GCC Sub-Clause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.4 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5. Language

5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Procuring Entity, shall be written in the **English Language.** Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate and certified translation of the relevant passages in the **English Language,** in which case, for purposes of interpretation of the Contract, the English language is translation shall govern.

5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation, for documents provided by the Supplier.

6. Joint Venture, Consortium or Association

6.1 If the Supplier is a joint venture, consortium, or association, all of the parties shall be jointly and severally liable to the Procuring Entity for the fulfilment of the provisions of the Contract and shall designate one member of the joint venture, consortium, or association to act as a leader with authority to bind the joint venture, consortium, or association. The composition or the constitution of the joint venture, consortium, or association shall not be altered without the prior written consent of the Procuring Entity.

7. Eligibility

7.1 The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Sub- contractor shall be deemed to have the nationality of a country if it is a citizen or constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country.

7.2 All Goods and Related Services to be supplied under the Contract shall have their origin in Eligible Countries. For the purpose of this Clause, origin means the country where the goods have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its components.

7.3 The Tenderer, if a Kenyan firm, must submit with its tender a valid tax compliance certificate from the Kenya Revenue Authority.

8. Notices

8.1 Any notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the **SCC.** The term "in writing" means communicated in written form with proof of receipt.

8.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

9. Governing Law

9.1 The Contract shall be governed by and interpreted in accordance with the laws of Kenya.

9.2 Throughout the execution of the Contract, the Supplier shall comply with the import of goods and services prohibitions in Kenya:

a) where, as a matter of law, compliance or official regulations, Kenya prohibits commercial relations with that country or any import of goods from that country or any payments to any country, person, or entity in that country ; or

b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, Kenya prohibits any import of goods from that country or any payments to any country, person, or entity.

10. Settlement of Disputes

10.1 The Procuring Entity and the Supplier shall make every effort to resolve amicably by direct negotiation any disagreement or dispute arising between them under or in connection with the Contract.

10.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the Procuring Entity or the Supplier may give notice to the other party of its intention to commence

arbitration, as hereinafter provided, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given. Any dispute or difference in respect of

which a notice of intention to commence arbitration has been given in accordance with this Clause shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the Goods under the Contract.

10.2 **Arbitration proceedings shall be conducted as follows:**

10.2.1 Any claim or dispute between the Parties arising out of or in connection with the Contract not settled amicably in accordance with Sub-Clause 10.1 shall be finally settled by arbitration.

10.2.2 No arbitration proceedings shall be commenced on any claim or dispute where notice of a claim or dispute has not been given by the applying party within thirty days of the occurrence or discovery of the matter or issue giving rise to the dispute.

10.2.3 Notwithstanding the issue of a notice as stated above, the arbitration of such a claim or dispute shall not commence unless an attempt has in the first instance been made by the parties to settle such claim or dispute amicably with or without the assistance of third parties. Proof of such attempt shall be required.

10.2.4 The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, or valuations as may in his opinion be desirable in order to determine the rights of the parties and assess and award any sums which ought to have been the subject of or included in any due payments.

10.2.5 Neither Party shall be limited in the proceedings before the arbitrators to the evidence, or to the reasons for the dispute given in its notice of a claim or dispute.

10.2.6 Arbitration may be commenced prior to or after delivery of the goods. The obligations of the Parties shall not be altered by reason of any arbitration being conducted during the progress of the delivery of goods.

10.2.7 The terms of the remuneration of each or all the members of Arbitration shall be mutually agreed upon by the Parties when agreeing the terms of appointment. Each Party shall be responsible for paying one-half of this remuneration.

10.3 **Arbitration Proceedings**

10.3.1 Arbitration proceedings with national suppliers will be conducted in accordance with the Arbitration Laws of Kenya. In case of any claim or dispute, such claim or dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be referred to the arbitration and final decision of a person or persons to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed, on the request of the applying party, by the Chairman or Vice Chairman of any of the following professional institutions;

i) Kenya National Chamber of Commerce

ii) Chartered Institute of Arbitrators (Kenya Branch)

iii) The Law Society of Kenya

10.3.2 The institution written to first by the aggrieved party shall take precedence over all other institutions.

10.3.3 Alternative Arbitration Proceedings

Alternatively, the Parties may refer the matter to the Nairobi Centre for International Arbitration (NCIA) which offers a neutral venue for the conduct of national and international arbitration with commitment to providing institutional support to the arbitral process.

10.4 **Arbitration with Foreign Suppliers**

10.4.1 Arbitration with foreign suppliers shall be conducted in accordance with the arbitration rules of the United Nations Commission on International Trade Law (UNCITRAL); or with proceedings administered by the International Chamber of Commerce (ICC) and conducted under the ICC Rules of Arbitration; by one or more arbitrators appointed in accordance with said arbitration rules.

10.4.2 The place of arbitration shall be a location specified in the **SCC;** and the arbitration shall be conducted in the language for communications defined in Sub-Clause 1.4 [Law and Language].

10.5 Alternative Arbitration Proceedings

Alternatively, the Parties may refer the matter to the Nairobi Centre for International Arbitration (NCIA) which offers a neutral venue for the conduct of national and international arbitration with commitment to providing institutional support to the arbitral process.

10.6 Failure to Comply with Arbitrator's Decision

10.6.1 The award of such Arbitrator shall be final and binding upon the parties.

10.6.1 In the event that a Party fails to comply with a final and binding Arbitrator's decision, then the other Party may, without prejudice to any other rights it may have, refer the matter to a competent court of law.

10.7 Contract operations continue

Notwithstanding any reference to arbitration herein,

a) the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and

b) the Procuring Entity shall pay the Supplier any monies due the Supplier.

11. Inspections and Audit by the Procuring Entity

11.1 The Supplier shall keep, and shall cause its Subcontractors to keep, accurate and systematic accounts and records in respect of the Goods in such form and details as will clearly identify relevant time, changes and costs.

11.2 Pursuant to paragraph 2.2 of Instruction to Tenderers, the Supplier shall permit and shall cause its subcontractors to permit, the Procuring Entity and/or persons appointed by the Procuring Entity or by other statutory bodies of the Government to inspect the Site and/or the accounts and records relating to the procurement process, selection and/or contract execution, and to have such accounts and records audited by auditors appointed by the Procuring Entity. The Supplier's and its Subcontractors' attention is drawn to Sub- Clause 3.1 which provides, inter alia, that acts intended to materially impede the exercise of the Procuring Entity's inspection and audit rights constitute a prohibited practice subject to contract termination, as well as to a determination of ineligibility.

12. Scope of Supply

12.1 The Goods and Related Services to be supplied shall be as specified in the Schedule of Requirements.

3. Delivery and Documents

13.1 Subject to GCC Sub-Clause 33.1, the delivery of the Goods and completion of the Related Services shall be in accordance with the List of Goods and Delivery Schedule specified in the Supply Requirements. The details of shipping and other documents to be furnished by the Supplier are specified in the **SCC.**

4. Supplier's Responsibilities

14.1 The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 12, and the Delivery and Completion Schedule, as per GCC Clause 13.

5. Contract Price

15.1 Prices charged by the Supplier for the Goods supplied and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its Tender, with the exception of any price adjustments authorized in the **SCC.**

15.2 Where the contract price is different from the corrected tender price, in order to ensure the supplier is not paid less or more relative to the contract price (*which would be the tender price*), any partial payment valuation based

on rates in the schedule of prices in the Tender, will be adjusted by a plus or minus percentage. The percentage already worked out during tender evaluation is worked out as follows: *(corrected tender price – tender price)/tender price X 100*.

6. Terms of Payment

16.1 The Supplier shall request for payment by submitting invoice(s), delivery note(s) and any other relevant documents as specified in the SCC to the Procuring Entity.

16.2 Payments shall be made promptly by the Procuring Entity, but not later than thirty (30) days after submission of an invoice by the Supplier, and after the Procuring Entity has accepted it.

16.3 Where a Procuring Entity rejects Goods and Related Services, in part or wholly, the procuring Entity shall promptly inform the Supplier to collect, replace or rectify as appropriate and give reasons for rejection. The Supplier shall submit a fresh invoice, delivery note and any other relevant documents as specified in the SCC.

16.4 The currencies in which payments shall be made to the Supplier under this Contract shall be those in which the Tender price is expressed.

16.5 In the event that the Procuring Entity fails to pay the Supplier any payment by its due date or within the period set forth in the **SCC,** the Procuring Entity may pay to the Supplier interest on the amount of such delayed payment at the rate shown in the **SCC,** for the period of delay until payment has been made in full, whether before or after judgment or arbitrage award.

Taxes and Duties

17.1 The Supplier shall be entirely responsible for all taxes, duties, license fees, and other such levies incurred to deliver the Goods and Related Services to the Procuring Entity at the final delivery point.

17.3 If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in Kenya, the Supplier shall inform the Procuring Entity and the Procuring Entity shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.

7. Performance Security

18.1 If required as specified in the SCC, the Supplier shall, within twenty-eight (28) days of the notification of contract award, provide a performance security for the performance of the Contract in the amount specified in the **SCC.**

18.2 The proceeds of the Performance Security shall be payable to the Procuring Entity as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

18.3 As specified in **the SCC**, the Performance Security, if required, shall be denominated in the currency(ies) of the Contract, or in a freely convertible currency acceptable to the Procuring Entity; and shall be in one of the formats stipulated by the Procuring Entity in **the SCC**, or in another format acceptable to the Procuring Entity.

18.4 The Performance Security shall be discharged by the Procuring Entity and returned to the Supplier not later than thirty (30) days following the date of Completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in the **SCC.**

8. Copyright

19.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Procuring Entity by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Procuring Entity directly or through the Supplier by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

9. Confidential Information

20.1 The Procuring Entity and the Supplier shall keep confidential and shall not, without the written

consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Sub-Supplier such documents, data, and other information it receives from the Procuring Entity to the extent required for the Sub Supplier to perform its work under the Contract, in which event the Supplier shall obtain from such Sub Supplier undertaking of confidentiality similar to that imposed on the Supplier under GCC Clause 20.

20.2 The Procuring Entity shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Procuring Entity for any purpose other than the performance of the Contract.

20.3 The obligation of a party under GCC Sub-Clauses 20.1 and 20.2 above, however, shall not apply to information that:

a) the Procuring Entity or Supplier need to share with other arms of Government or other bodies participating in the financing of the Contract; such parties shall de disclosed in **the SCC;**

b) now or hereafter enters the public domain through no fault of that party;

c) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or

d) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

20.4 The above provisions of GCC Clause 20 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

20.5 The provisions of GCC Clause 20 shall survive completion or termination, for whatever reason, of the Contract.

10. Subcontracting

21.1 The Supplier shall notify the Procuring Entity in writing of all subcontracts awarded under the Contract if not already specified in the Tender. Such notification, in the original Tender or later shall not relieve the Supplier from any of its obligations, duties, responsibilities, or liability under the Contract.

21.2 Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.

11. Specifications and Standards

22.1 Technical Specifications and Drawings

a) The Goods and Related Services supplied under this Contract shall conform to the technical specifications and standards mentioned in Section V, Schedule of Requirements and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the Goods' country of origin.

b) The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designed by or on behalf of the Procuring Entity, by giving a notice of such disclaimer to the Procuring Entity.

c) Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Schedule of Requirements. During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Procuring Entity and shall be treated in accordance with GCC Clause 33.

12. Packing and Documents

23.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or

deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the goods' final destination and the absence of heavy handling facilities at all points in transit.

23.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified **in the SCC**, and in any other instructions ordered by the Procuring Entity.

13. Insurance

24.1 Unless otherwise specified in the **SCC,** the Goods supplied under the Contract shall be fully insured—in a freely convertible currency from an eligible country—against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the **SCC.**

14. Transportation and Incidental Services

25.1 Unless otherwise specified in the **SCC,** responsibility for arranging transportation of the Goods shall be in accordance with the specified Incoterms.

25.2 The Supplier may be required to provide any or all of the following services, including additional services, if any, specified **in SCC:**

a) performance or supervision of on-site assembly and/or start-up of the supplied Goods;

b) furnishing of tools required for assembly and/or maintenance of the supplied Goods;

c) furnishing of a detailed operations and maintenance manual for each appropriate unit of the supplied Goods;

d) performance or supervision or maintenance and/or repair of the supplied Goods, for a period of time agreed by the parties, provided that this service shall not relieve the Supplier of any warranty obligations under this Contract; and

e) training of the Procuring Entity's personnel, at the Supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods.

25.3 Prices charged by the Supplier for incidental services, if not included in the Contract Price for the Goods, shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services

15. Inspections and Tests

26.1 The Supplier shall at its own expense and at no cost to the Procuring Entity carry out all such tests and/or inspections of the Goods and Related Services as are specified in the **SCC.**

26.2 The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the Goods' final destination, or in another place in Kenya as specified in the **SCC.** Subject to GCC Sub-Clause 26.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Procuring Entity.

26.3 The Procuring Entity or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Sub-Clause 26.2, provided that the Procuring Entity bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all travelling and board and lodging expenses.

26.4 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Procuring Entity. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Procuring Entity or its designated representative to attend the test and/or inspection.

26.5 The Procuring Entity may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications codes and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.

26.6 The Supplier shall provide the Procuring Entity with a report of the results of any such test and/or inspection.

26.7 The Procuring Entity may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Procuring Entity, and shall repeat the test and/or inspection, at no cost to the Procuring Entity, upon giving a notice pursuant to GCC Sub- Clause 26.4.

26.8 The Supplier agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Procuring Entity or its representative, nor the issue of any report pursuant to GCC Sub-Clause 26.6, shall release the Supplier from any warranties or other obligations under the Contract.

16. Liquidated Damages

27.1 Except as provided under GCC Clause 32, if the Supplier fails to deliver any or all of the Goods by the Date(s) of delivery or perform the Related Services within the period specified in the Contract, the Procuring Entity may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the **SCC** of the delivered price of the delayed Goods or unperformed Services for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in those **SCC.** Once the maximum is reached, the Procuring Entity may terminate the Contract pursuant to GCC Clause 35.

28. Warranty

28.1 The Supplier warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

28.2 Subject to GCC Sub-Clause 22.1(b), the Supplier further warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.

28.3 Unless otherwise specified in the **SCC,** the warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the **SCC,** or for eighteen (18) months after the date of shipment from the port or place of loading in the country of origin, whichever period concludes earlier.

28.4 The Procuring Entity shall give notice to the Supplier stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Procuring Entity shall afford all reasonable opportunity for the Supplier to inspect such defects.

28.5 Upon receipt of such notice, the Supplier shall, within the period specified in the **SCC,** expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Procuring Entity.

28.6 If having been notified, the Supplier fails to remedy the defect within the period specified in the **SCC,** the Procuring Entity may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Procuring Entity may have against the Supplier under the Contract.

29. Patent Indemnity

29.1 The Supplier shall, subject to the Procuring Entity's compliance with GCC Sub-Clause 29.2, indemnify and hold harmless the Procuring Entity and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Procuring Entity may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of:

a) the installation of the Goods by the Supplier or the use of the Goods in the country where the Site is located; and

b) the sale in any country of the products produced by the Goods.

Such indemnity shall not cover any use of the Goods or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, neither any infringement resulting from the use of the Goods or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Supplier, pursuant to the Contract.

29.2 If any proceedings are brought or any claim is made against the Procuring Entity arising out of the matters referred to in GCC Sub-Clause 29.1, the Procuring Entity shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Procuring Entity's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

29.3 If the Supplier fails to notify the Procuring Entity within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Procuring Entity shall be free to conduct the same on its own behalf.

29.4 The Procuring Entity shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

29.5 The Procuring Entity shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Supplier may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Procuring Entity.

30. Limitation of Liability

30.1 Except in cases of criminal negligence or willful misconduct,

a) the Supplier shall not be liable to the Procuring Entity, whether in contract, tort, or otherwise, for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Procuring Entity, and

b) the aggregate liability of the Supplier to the Procuring Entity, whether under the Contract, in tort or otherwise, shall not exceed the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the supplier to indemnify the Procuring Entity with respect to patent infringement.

31. Change in Laws and Regulations

31.1 Unless otherwise specified in the Contract, if after the date of 30 days prior to date of Tender submission, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in Kenya (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or

reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with GCC Clause 15.

32. Force Majeure

32.1 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

32.2 For purposes of this Clause, "Force Majeure" means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Procuring Entity in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

32.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Procuring Entity in writing of such condition and the cause thereof. Unless otherwise directed by the Procuring Entity in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

33. Change Orders and Contract Amendments

33.1 The Procuring Entity may at any time order the Supplier through notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:

a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Procuring Entity;

b) the method of shipment or packing;

c) the place of delivery; and

d) the Related Services to be provided by the Supplier.

33.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery/Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within twenty-eight (28) days from the date of the Supplier's receipt of the Procuring Entity's change order.

33.3 Prices to be charged by the Supplier for any Related Services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

33.4 **Value Engineering:** The Supplier may prepare, at its own cost, a value engineering proposal at any time during the performance of the contract. The value engineering proposal shall, at a minimum, include the following;

a) the proposed change(s), and a description of the difference to the existing contract requirements;

b) a full cost/benefit analysis of the proposed change(s) including a description and estimate of costs (including life cycle costs) the Procuring Entity may incur in implementing the value engineering proposal; and

c) a description of any effect(s) of the change on performance/functionality.

33.5 The Procuring Entity may accept the value engineering proposal if the proposal demonstrates benefits that:

a) accelerates the delivery period; or

b) reduces the Contract Price or the life cycle costs to the Procuring Entity; or

c) improves the quality, efficiency or sustainability of the Goods; or

d) yields any other benefits to the Procuring Entity, without compromising the necessary functions of the Facilities.

33.6 If the value engineering proposal is approved by the Procuring Entity and results in:

a) a reduction of the Contract Price; the amount to be paid to the Supplier shall be the percentage specified **in the SCC** of the reduction in the Contract Price; or

b) an increase in the Contract Price; but results in a reduction in life cycle costs due to any benefit described in
(a) to (d) above, the amount to be paid to the Supplier shall be the full increase in the Contract Price.

33.7 Subject to the above, no variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

34. Extensions of Time

34.1 If at any time during performance of the Contract, the Supplier or its subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to GCC Clause 13, the Supplier shall promptly notify the Procuring Entity in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Procuring Entity shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

34.2 Except in case of Force Majeure, as provided under GCC Clause 32, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 26, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 34.1.

7. Termination

35.1 Termination for Default
a) The Procuring Entity, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, may terminate the Contract in whole or in part:
i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Procuring Entity pursuant to GCC Clause 34;
ii) if the Supplier fails to perform any other obligation under the Contract; or
iii) if the Supplier, in the judgment of the Procuring Entity has engaged in Fraud and Corruption, as defined in paragraph 2.2 a of the Appendix to the GCC, in competing for or in executing the Contract.
b) In the event the Procuring Entity terminates the Contract in whole or in part, pursuant to GCC Clause 35.1(a), the Procuring Entity may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Procuring Entity for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

35.2 Termination for Insolvency.

The Procuring Entity may at any time terminate the Contract by giving notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Procuring Entity

35.2 Termination for Convenience.
a) The Procuring Entity, by notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination is for the Procuring Entity's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.
b) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of notice of termination shall be accepted by the Procuring Entity at the Contract terms and prices. For the remaining Goods, the Procuring Entity may elect:
i) to have any portion completed and delivered at the Contract terms and prices; and/or
ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

8. Assignment

36.1 Neither the Procuring Entity nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

9. Export Restriction

37.1 Notwithstanding any obligation under the Contract to complete all export formalities, any export restrictions attributable to the Procuring Entity, to Kenya, or to the use of the products/goods, systems or services to be supplied, which arise from trade regulations from a country supplying those products/goods, systems or services, and which substantially impede the Supplier from meeting its obligations under the Contract, shall release the Supplier from the obligation to provide deliveries or services, always provided, however, that the Supplier can demonstrate to the satisfaction of the Procuring Entity that it has completed all formalities in a timely manner, including applying for permits, authorizations and licenses necessary for the export of the products/goods, systems or services under the terms of the Contract. Termination of the Contract on this basis shall be for the Procuring Entity's convenience pursuant to Sub-Clause 35.3.

SECTION VII - SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract (SCC) shall supplement and/or amend the General Conditions of Contract (GCC).Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

[The Procuring Entity shall select insert the appropriate wording using the samples below or other acceptable wording, and delete the text in italics].

GCC 1.1(h)	The Procuring Entity is: ***[Kenya Electricity Generating Company PLC***
GCC 23.1	The Final Destination(s) is/are: *[KenGen Kipevu I Power Station)*
GCC 2.2	The version edition of Incoterms shall be *INCOTERMS 2020*
GCC 8.1	For **notices**, the Procuring Entity's address shall be: Attention: **General Manager Supply Chain** Postal address **P.O Box 47936 00100 Nairobi, Kenya** Physical Address **KenGen Pension Plaza II, 9th Floor, Kolobot Road, Parklands.** Telephone: **0711036000** Electronic mail address: **contracts@kengen.co.ke;**
GCC 10.4.2	The place of arbitration shall be **Nairobi, Kenya**. (Nairobi Centre for International Arbitration)
GCC 15.1	The prices charged for the Goods supplied and the related Services performed *"shall not,"* be adjustable.
GCC 16.1	GCC 16.1—The method and conditions of payment to be made to the Supplier under this Contract shall be as follows: **Payment Terms and Conditions** Payment Milestones 1. 50% upon successful completion of FAT and delivery of goods at Kipevu III stores 2. 35% upon successful installation, testing and commissioning of DCS HMI and PLC system 3. 10 % upon delivery of spares and project documentation. 4. 5 % retention

	Advance Payment Advance payment is not applicable.
GCC 18.1	**Performance Security** Performance security shall be at **10% of the Contract Price for contracts above five (5) millions.** The performance security shall remain valid for **30 days beyond the validity of the contract.**
GCC 18.3	The Performance Security shall be in the form of: *an on-Demand Bank Guarantee from a bank registered by Central Bank of Kenya"* The Performance security shall be denominated in the currency of the contract or a freely *convertible currency acceptable to the KenGen.*
GCC 24.1	The insurance coverage shall be as specified in the Incoterms. If not in accordance with Incoterms, insurance shall be as follows:
GCC 25.1	*"The Supplier is required under the Contract to transport the Goods to a specified place of final destination within* Kenya*, defined as the Project Site, transport to such place of destination in* Kenya*, including insurance and storage, as shall be specified in the Contract, shall be arranged by the Supplier, and related costs shall be included in the Contract Price"; or any other agreed upon trade terms*
GCC 13.1	**Delivery:** Delivery period shall be **8 Months** from the contract commencement date.
	Contract duration The contract duration shall be three years from the commencement date. The commencement date shall be the date of contract signature or as agreed by both parties in writing.
GCC 5.1	**Language** The contract shall be written in the English language. All correspondence and other documents pertaining to the contract, which are exchanged by the parties, shall be written in the same language.
GCC 17.1	**Taxes** a) **"Taxes"** means all present and future taxes, levies, duties, charges, assessments, deductions or withholdings whatsoever, including any interest thereon, and any penalties and fines with respect thereto, wherever imposed, levied, collected, or withheld pursuant to any regulation having the force of law and "Taxation" shall be construed accordingly. b) Local Taxation i.Nothing in the Contract shall relieve the Contractor and/or his Sub-Contractors from their responsibility to pay any taxes, statutory contributions and levies that may be levied on them in Kenya in respect of the Contract. ii.The Contract Price shall include all applicable taxes and shall not be adjusted for any of these taxes. iii.Tax exemption granted under this Contract shall be for an official aid funded project and shall be as provided under the applicable tax laws in Kenya. iv. The Contractor shall be deemed to be familiar with the tax laws in the Employer's Country and satisfied themselves with the requirements for all taxes, statutory contributions and duties to which they may be subjected during the term

	of the Contract. This shall include applicable local or foreign withholding tax, excise duty, Value Added Tax (VAT), importation duties, Local government taxes, and any other taxes not mentioned herein. v. In instances where discussions are held between the Employer and the Contractor regarding tax matters, this shall not be deemed to constitute competent advice and hence does not absolve the Contractor of their responsibility in relation to due diligence on the tax issue as per (i). c)Tax Deduction i.If the Employer is required to make a tax deduction by Law, then the deduction shall be made from payments due to the Contractor and paid directly to the Kenya Revenue Authority. The Employer shall upon remitting the tax to Kenya Revenue Authority furnish the Contractor with the relevant tax deduction certificates. ii.Where payments for the Contract Price are made directly by the financiers to the Contractor, the Contractor and the financiers shall make the necessary arrangements with Employer to ensure that withholding income tax is remitted to the Kenya Revenue Authority. d) Tax Indemnity i.The Contractor shall indemnify and hold the Employer harmless from and against any and all tax liabilities, which the Employer may incur for any reason of failure by the Contractor to comply with any tax laws arising from the execution of the Contract whether during the term of the Contract or after its expiry. ii.The Contractor warrants to pay the Employer (within fourteen (14) days of demand by the Employer), an amount equal to the loss, liability or cost which the Employer determines has been (directly or indirectly) suffered by the Employer for or on account of the Contractor's Tax liability arising from the Contract. iii.Where the amount in (ii) above remains unpaid after the end of the fourteen (14) days moratorium, the Employer shall be entitled to compensation for financing charges.
GCC 26.1	The inspections and tests shall be: **Pre-shipment inspection** • All consignments subject to Pre-Export Verification of Conformity (PVoC) to Standards Programme must obtain a Certificate of Conformity (CoC) issued by PvoC Country Offices Prior to shipment. The Certificate is a mandatory Customs Clearance document in Kenya; • Consignments arriving at Kenyan Ports without this document will be denied entry into the Country. • Since PVoC is a conformity assessment process to verify that products imported to Kenya are in compliance with the applicable Kenya standards or approved equivalents, regulations and technical requirements before shipment, it is the sole responsibility of the supplier (i.e. exporter) to demonstrate the same and hence meet any associated costs of verification.

GCC 26.2	The Factory Inspections and Acceptance tests shall be conducted at Supplier's premises and executed as per specifications in Technical Requirement. There shall be site acceptance test at KenGen Premises and executed as per specifications in Technical Requirement.

SECTION VIII - CONTRACT FORMS

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful tenderer after contract award.

-

-

FORM No 1: NOTIFICATION OF INTENTION TO AWARD

This Notification of Intention to Award shall be sent to each Tenderer that submitted a Tender. Send this Notification to the Tenderer's Authorized Representative named in the Tender Information Form on the format below.

FORMAT

1. For the attention of Tenderer's Authorized Representative

I) Name:_____*[insert Authorized Representative's name]*

ii) Address:_____*[insert Authorized Representative's Address]*

iii) Telephone:_____*[insert Authorized Representative's telephone/fax numbers]*

iv) Email Address:_____*[insert Authorized Representative's email address]*

[IMPORTANT: insert the date that this Notification is transmitted to Tenderers. The Notification must be sent to all Tenderers simultaneously. This means on the same date and as close to the same time as possible.]

2. Date of transmission:_____[*email*] on [*date*]_____(local time)

This Notification is sent by_____(*Name and designation*) _____

3. Notification of Intention to Award

I) Employer:_____*[insert the name of the Employer]*

ii) Project:_____*[insert name of project]*

iii) Contract title:_____*[insert the name of the contract]*

iv) Country:_____*[insert country where ITT is issued]*

v) ITT No:_____*[insert ITT reference number from Procurement Plan]*

This Notification of Intention to Award (Notification) notifies you of our decision to award the above contract. The transmission of this Notification begins the Standstill Period. During the Standstill Period, you may:

4. Request a debriefing in relation to the evaluation of your tender

Submit a Procurement-related Complaint in relation to the decision to award the contract.

a) The successful tenderer

i) Name of successful Tender_____

ii) Address of the successful Tender _____

iii) Contract price of the successful Tender Kenya Shillings_____(in words _____)

b) Other Tenderers

Names of all Tenderers that submitted a Tender. If the Tender's price was evaluated include the evaluated price as well as the Tender price as read out. For Tenders not evaluated, give one main reason the Tender was unsuccessful.

S/No	Name of Tender	Tender Price read out	Tender's evaluated pri (Note a)	One Reason Why Not Evaluated
1				
2				
3				
4				
5				

(Note a) State NE if not evaluated

5. How to request a debriefing

a) DEADLINE: The deadline to request a debriefing expires at midnight on [*insert date*] (*local time*).

b) You may request a debriefing in relation to the results of the evaluation of your Tender. If you decide to request a debriefing your written request must be made within three (5) Business Days of receipt of this Notification of Intention to Award.

c) Provide the contract name, reference number, name of the Tenderer, contact details; and address the request for debriefing as follows:

I) Attention:__[*insert full name of person, if applicable*]

ii) Title/position:_____[*insert title/position*]

ii) Agency:____[*insert name of Employer*]

iii) Email address:_____[*insert email address*]

d) If your request for a debriefing is received within the 3 Days deadline, we will provide the debriefing within five (3) Business Days of receipt of your request. If we are unable to provide the debriefing within this period, the Standstill Period shall be extended by five (3) Days after the date that the debriefing is provided. If this happens, we will notify you and confirm the date that the extended Standstill Period will end.

e) The debriefing may be in writing, by phone, video conference call or in person. We shall promptly advise you in writing how the debriefing will take place and confirm the date and time.

f) If the deadline to request a debriefing has expired, you may still request a debriefing. In this case, we will provide the debriefing as soon as practicable, and normally no later than fifteen (15) Days from the date of publication of the Contract Award Notice.

6. How to make a complaint

a) Period: Procurement-related Complaint challenging the decision to award shall be submitted by midnight, [*insert date*] (local time).

b) Provide the contract name, reference number, name of the Tenderer, contact details; and address the Procurement-related Complaint as follows:

I) Attention:__[*insert full name of person, if applicable*]

ii) Title/position:_____[*insert title/position*]

iii) Agency:____[*insert name of Employer*]

iv) Email address:_____[*insert email address*]

c) At this point in the procurement process, you may submit a Procurement-related Complaint challenging the decision to award the contract. You do not need to have requested, or received, a debriefing before making this complaint. Your complaint must be submitted within the Standstill Period and received by us before the Standstill Period ends.

d) Further information: For more information refer to the Public Procurement and Disposals Act 2015 and its Regulations available from the Website www.ppra.go.ke or email complaints@ppra.go.ke.

You should read these documents before preparing and submitting your complaint.

e) There are four essential requirements:

i) You must be an 'interested party'. In this case, that means a Tenderer who submitted a Tender in this tendering process, and is the recipient of a Notification of Intention to Award.

ii) The complaint can only challenge the decision to award the contract.

iii) You must submit the complaint within the period stated above.

iv) You must include, in your complaint, all of the information required to support your complaint.

7. Standstill Period

i) DEADLINE: The Standstill Period is due to end at midnight on [*insert date*] (local time).

ii) The Standstill Period lasts ten (14) Days after the date of transmission of this Notification of Intention to Award.

iii) The Standstill Period may be extended as stated in paragraph Section 5 (d) above.

If you have any questions regarding this Notification please do not hesitate to contact us.

On behalf of the Employer:

Signature: _____

Name:Title/position: _____

Telephone: _____

Email: _____

FORM NO 2: NOTIFICATION OF AWARD - LETTER OF ACCEPTANCE

[letterhead paper of the Employer]

_____*[date]*

To_____*[name and address of the Contractor]*

This is to notify you that your Tender dated___*[date]* for execution of the_____*[name of the Contract and identification number, as given in the Contract Data]* for the Accepted Contract Amount_____ *[amount in numbers and words] [name of currency]*, as corrected and modified in accordance with the Instructions to Tenderers, is hereby accepted by_ _____*(name of Employer)*.

You are requested to furnish the Performance Security within 30 days in accordance with the Conditions of Contract, using, for that purpose, one of the Performance Security Forms included in Section VIII, Contract Forms, of the Tender Document.

Authorized Signature:_____

Name and Title of Signatory:_____

Name of Employer:_____

Attachment: *Contract Agreement:*_____

NOTIFICATION OF AWARD - LETTER OF ACCEPTANCE

[use letterhead paper of the Procuring Entity]

_____*[date]*

To:_____*[name and address of the Supplier]*

Subject:_____***Notification of Award Contract No.***. . . . . ..

This is to notify you that your Tender dated_____***[insert date]*** for execution of the____***[insert name of the contract and identification number, as given in the SCC]*** for the Accepted Contract Amount of_____***[insert amount in numbers and words and name of currency]***, as corrected and modified in accordance with the Instructions to tenderers is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 30 days in accordance with the Conditions of Contract, using for that purpose the of the Performance Security Form included in Section X, Contract Forms, of the Tendering document.

Authorized Signature:_____

Name and Title of Signatory:_____

Name of Agency:_____

Attachment: Contract Agreement

FORM NO 3 - CONTRACT AGREEMENT

[The successful tenderer shall fill in this form in accordance with the instructions indicated]

THIS AGREEMENT made the_____*[insert: **number**]* day of_____ _____*[insert: **month**]*, *[insert: **year**]*. BETWEEN (1)_____*[insert complete name of Procuring Entity* and having its principal place of business at *[insert: address of Procuring Entity]* (hereinafter called "Procuring Entity"), of the one part; and (2)____*[insert name of Supplier**]***, a corporation incorporated under the laws of *[insert: country of Supplier**]*** and having its principal place of business at_____*[insert: address of Supplier]* (hereinafter called "the Supplier"), of the other part.

3. WHEREAS the Procuring Entity invited Tenders for certain Goods and ancillary services, viz.,_____ *[insert brief description of Goods and Services]* and has accepted a Tender by the Supplier for the supply of those Goods and Services, the Procuring Entity and the Supplier agree as follows:

i) In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

ii) The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other contract documents.

a) the Letter of Acceptance

b) the Letter of Tender

c) the Addenda Nos._____(if any)

d) Special Conditions of Contract

e) General Conditions of Contract

f) the Specification (including Schedule of Requirements and Technical Specifications)

g) the completed Schedules (including Price Schedules)

h) any other document listed in GCC as forming part of the Contract

iii) In consideration of the payments to be made by the Procuring Entity to the Supplier as specified in this Agreement, the Supplier hereby covenants with the Procuring Entity to provide the Goods and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Procuring Entity hereby covenants to pay the Supplier in consideration of the provision of the Goods and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

5. IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Kenya on the day, month and year indicated above.

For and on behalf of the Procuring Entity

Signed:_____*[insert signature]*

in the capacity of_____*[insert title or other appropriate designation]*

In the presence of_____*[insert identification of official witness]*_

For and on behalf of the Supplier

Signed:_____*[insert signature of authorized representative(s) of the Supplier]*
in the capacity of_____*[insert title or other appropriate designation]* in the presence of_____*[insert identification of official witness]*

FORM NO. 4 - PERFORMANCE SECURITY [Option I - Unconditional Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary:_____*[insert name and Address of*

Employer*]* **Date:**___*[Insert date of issue]*

Guarantor:____*[Insert name and address of place of issue, unless indicated in the letterhead]*

1. We have been informed that_ _(hereinafter called "the Contractor") has entered into Contract No._____ _dated _____with *(name of Employer)*_____(the Employer as the Beneficiary), for the execution of_____(hereinafter called "the Contract").

2. Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of_____(*in words*),[1] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Applicant is in breach of its obligation(s) under the Contract, without the Beneficiary needing to prove or to show grounds for your demand or the sum specified therein.

4. This guarantee shall expire, no later than the …. Day of ……, 2……[2], and any demand for payment under it must be received by us at the office indicated above on or before that date.

5. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months] [one year],* in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

[Name of Authorized Official, signature(s) and seals/stamps]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

FORM No. 5 - PERFORMANCE SECURITY [Option 2– Performance Bond]

[Note: Procuring Entities are advised to use Performance Security – Unconditional Demand Bank Guarantee instead of Performance Bond due to difficulties involved in calling Bond holder to action]

[Guarantor letterhead or SWIFT identifier code]

Beneficiary:_____*[insert name and Address of*

Employer*]* **Date:**_*[Insert date of issue]*

PERFORMANCE BOND No.:_____

Guarantor:_____*[Insert name and address of place of issue, unless indicated in the letterhead]*

1. By this Bond_____ as Principal (hereinafter called "the Contractor") and_____] as Surety (hereinafter called "the Surety"), are held and firmly bound unto_____] as Obligee (hereinafter called "the Employer") in the amount of_for the payment of which sum well and truly to be made in the types and proportions of currencies in which the Contract Price is payable, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

2. WHEREAS the Contractor has entered into a written Agreement with the Employer dated the___day of , 20___, for_____in accordance with the documents, plans, specifications, and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

3. NOW, THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Employer to be, in default under the Contract, the Employer having performed the Employer's obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

1) complete the Contract in accordance with its terms and conditions; or

2) obtain a tender or tenders from qualified tenderers for submission to the Employer for completing the Contract in accordance with its terms and conditions, and upon determination by the Employer and the Surety of the lowest responsive Tenderers, arrange for a Contract between such Tenderer, and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the Balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "Balance of the Contract Price," as used in this paragraph, shall mean the total amount payable by Employer to Contractor under the Contract, less the amount properly paid by Employer to Contractor; or

3) pay the Employer the amount required by Employer to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

4. The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

5. Any suit under this Bond must be instituted before the expiration of one year from the date of the issuing of the Taking-Over Certificate. No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Employer named herein or the heirs, executors, administrators, successors, and assigns of the Employer.

6. In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this day_____of_____20_____.

SIGNED ON_____on behalf

of By_____in the

capacity of In the presence of

SIGNED ON_____on behalf of

By_____in the

capacity of In the presence of

FORM NO. 6 - ADVANCE PAYMENT SECURITY [Demand Bank Guarantee]

[Guarantor letterhead]

Beneficiary:_____*[Insert name and Address of*

Employer*]* **Date:**__*[Insert date of issue]*

ADVANCE PAYMENT GUARANTEE No.:_____*[Insert guarantee reference*

number] **Guarantor:**_____*[Insert name and address of place*

of issue, unless indicated in the letterhead]

1. We have been informed that_____(hereinafter called "the Contractor") has entered into Contract No._____*dated*_____with the Beneficiary, for the execution of _____ (hereinafter called "the Contract").

2. Furthermore, we understand that, according to the conditions of the Contract, an advance payment in the sum _____(*in words*)is to be made against an advance payment guarantee.

3. At the request of the Contractor, we as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of_____(*in words*_____)[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating either that the Applicant:

a) has used the advance payment for purposes other than the costs of mobilization in respect of the goods; or

b) has failed to repay the advance payment in accordance with the Contract conditions, specifying the amount which the Applicant has failed to repay.

4. A demand under this guarantee may be presented as from the presentation to the Guarantor of a certificate from the Beneficiary's bank stating that the advance payment referred to above has been credited to the Contractor on its account number__at _____

5. The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as specified in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that ninety (90) percent of the Accepted Contract Amount, less provisional sums, has been certified for payment, or on the_____day of_____, 2__,[2] whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

6. The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed *[six months] [one year],* in response to the Beneficiary's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.

[Name of Authorized Official, signature(s) and seals/stamps]

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[1] *The Guarantor shall insert an amount representing the amount of the advance payment and denominated either in the currency of the advance payment as specified in the Contract.*

[2] *Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

FORM NO. 7 BENEFICIAL OWNERSHIP DISCLOSURE FORM
(Amended and issued pursuant to PPRA CIRCULAR No. 02/2022)

INSTRUCTIONS TO TENDERERS: DELETE THIS BOX ONCE YOU HAVE COMPLETED THE FORM

This Beneficial Ownership Disclosure Form ("Form") is to be completed by the successful tenderer pursuant to Regulation 13 (2A) and 13 (6) of the Companies (Beneficial Ownership Information) Regulations, 2020. In case of joint venture, the tenderer must submit a separate Form for each member. The beneficial ownership information to be submitted in this Form shall be current as of the date of its submission.

For the purposes of this Form, a Beneficial Owner of a Tenderer is any natural person who ultimately owns or controls the legal person (tenderer) or arrangements or a natural person on whose behalf a transaction is conducted, and includes those persons who exercise ultimate effective control over a legal person (Tenderer) or arrangement.

Tender Reference No.:_____[*insert identification no*] Name of the Tender Title/Description:_____*[insert name of the assignment]* to:_____*[insert complete name of Procuring Entity]*

In response to the requirement in your notification of award dated_____*[insert date of notification of award]* to furnish additional information on beneficial ownership:*[select one option as applicable and delete the options that are not applicable]*

I) We here by provide the following beneficial ownership information.

Details of beneficial ownership

	Details of all Beneficial Owners		**% of shares a person holds in the company Directly or indirectly**	**% of voting rights a person holds in the company**	**Whether a person directly or indirectly holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer** (Yes / No)	**Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)**
I.	Full Name		Directly--------- % of shares Indirectly---------- % of shares	Directly…….% of voting rights Indirectly----------% of voting rights	1. Having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer: Yes -----No---- 2. Is this right held directly or indirectly?:	1. Exercises significant influence or control over the Company body of the Company (tenderer) Yes ----- No----
	National identity card number or Passport number					
	Personal Identification Number (where applicable)					

	Details of all Beneficial Owners		**% of shares a person holds in the company Directly or indirectly**	**% of voting rights a person holds in the company**	**Whether a person directly or indirectly holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer** (Yes / No)	**Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)**
	Nationality				Direct……	2.Is this influence or control exercised directly or indirectly?
	Date of birth *[dd/mm/yyyy]*				……	
	Postal address				Indirect……	Direct……
	Residential address				……..	……..
	Telephone number					
	Email address					Indirect…
	Occupation or profession					……
2.	Full Name		Directly--------- % of shares	Directly…… …….% of voting rights	1.Having the right to appoint a majority of the board of the directors or an equivalent governing body of the Tenderer: Yes -----No---- 2.Is this right held directly or indirectly?:	1.Exercises significant influence or control over the Company body of the Company (tenderer) Yes ----- No---- 2.Is this influence or control exercised directly or indirectly?
	National identity card number or Passport number			Indirectly----------% of voting rights		
	Personal Identification Number (where applicable)		Indirectly---------- % of shares		Direct…… ……	Direct…… ……..
	Nationality(ies)				Indirect…… ……...	Indirect…
	Date of birth *[dd/mm/yyyy]*					
	Postal address					
	Residential address					
	Telephone number					
	Email address					

	Details of all Beneficial Owners		**% of shares a person holds in the company Directly or indirectly**	**% of voting rights a person holds in the company**	**Whether a person directly or indirectly holds a right to appoint or remove a member of the board of directors of the company or an equivalent governing body of the Tenderer** (Yes / No)	**Whether a person directly or indirectly exercises significant influence or control over the Company (tenderer) (Yes / No)**
	Occupation or profession					……
3. e. t. c						

II) Am fully aware that beneficial ownership information above shall be reported to the Public Procurement Regulatory Authority together with other details in relation to contract awards and shall be maintained in the Government Portal, published and made publicly available pursuant to Regulation 13(5) of the Companies (Beneficial Ownership Information) Regulations, 2020.(Notwithstanding this paragraph Personally Identifiable Information in line with the Data Protection Act shall not be published or made public). *Note that Personally Identifiable Information (PII) is defined as any information that can be used to distinguish one person from another and can be used to deanonymize previously anonymous data. This information includes National identity card number or Passport number, Personal Identification Number, Date of birth, Residential address, email address and Telephone number.*

III) In determining who meets the threshold of who a beneficial owner is, the Tenderer must consider a natural person who in relation to the company:

(a) holds at least ten percent of the issued shares in the company either directly or indirectly;

(b) exercises at least ten percent of the voting rights in the company either directly or indirectly;

(c) holds a right, directly or indirectly, to appoint or remove a director of the company; or

(d) exercises significant influence or control, directly or indirectly, over the company.

IV) What is stated to herein above is true to the best of my knowledge, information and belief.

Name of the Tenderer: .....[insert complete name of the Tenderer]*_____

*Name of the person duly authorized to sign the Tender on behalf of the Tenderer: ** [insert complete name of person duly authorized to sign the Tender]*

Designation of the person signing the Tender: ..... [insert complete title of the person signing the Tender]

Signature of the person named above: ..... [insert signature of person whose name and capacity are shown above]

Date this ..... [insert date of signing] day of..... [Insert month], [insert year]

Bidder Official Stamp