DEPARTMENT

MV/LV OPERATIONS

DIRECTORATE

ENERGY MANAGEMENT

DIVISION

MV/LV Network Control

PROCUREMENT DOCUMENT

GOODS / SERVICES

Documents are to be obtained, free of charge, in electronic format, from the National Treasury's eTenders website or the eThekwini Municipality's website.

Tender No: 34611- 5E

Title: PROCUREMENT OF GRID OPERATION SOLUTION FOR ENERGY MANAGEMENT DIRECTORATE FOR A PERIOD OF TWENTY-FOUR MONTHS

CLARIFICATION MEETING AND QUERIES

Clarification Meeting: There will be no clarification meeting.

Queries can be addressed to: Abel Malima; Tel: 031-311-9691; eMail: abel.malima@durban.gov.za

General / Contractual: Krystle Nageshar; Tel: 031-311-9786; eMail: Krystle.Nageshar@durban.gov.za

Technical: Bidders are requested to submit email queries related to the bid. All email queries are to be submitted by 2026-06-11 and Email questions and answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-06-18.

DELIVERY OF TENDERS

Sealed Tenders, addressed to the City Manager and marked with the Tender Number, are to be placed in the Tender Box **located in the ground floor foyer of the Municipal Buildings, 166 KE Masinga Road (Old Fort Rd), Durban** (and not any other municipal department):Tenderers are to also make an electronic submission via the eThekwini Municipality JDE System (ESP Module)

ESP Queries: Contact: Lindo Dlamini: Tel: 031-322-7133 / 031-322 7153
Email: supplier.selfservice@durban.gov.za

Closing Date: Friday, 26 June 2026

Time: 11:00am

FACSIMILE, eMAIL or POSTED TENDERS WILL NOT BE ACCEPTED

NAME OF TENDERER: .....

Tender Price: R .....

VAT Registered: YES / NO
(circle applicable)

Issued by:

ETHEKWINI MUNICIPALITY

Deputy Director: LUNTU MTHETHWA

Issued: May 2026 **Document Version: 01/12/2025**

NAME OF TENDERER: ……

Tender Price: R …… **VAT Registered: YES / NO**
(circle applicable)

PROCUREMENT DOCUMENT (Goods / Services)

INDEX

SECTION 1: GENERAL INFORMATION

YOU ARE HEREBY INVITED TO TENDER FOR REQUIREMENTS OF THE ETHEKWINI MUNICIPALITY

TENDER No.: 34611- 5E

DESCRIPTION: **PROCUREMENT OF GRID OPERATION SOLUTION FOR ENERGY MANAGEMENT DIRECTORATE FOR A PERIOD OF TWENTY-FOUR MONTHS**

CLOSING DATE / TIME: Friday, 26 June 2026 at 11:00am

All tenders must be submitted on official tender documentation issued (in electronic format) by the eThekwini Municipality from:

- the National Treasury's eTenders website (https://www.etenders.gov.za/), or
- the eThekwini Municipality's website (https://www.durban.gov.za/pages/business/procurement).

Electronically downloaded documentation should be printed by the tenderer.

- Bidders must submit a "hard copy" submission to the Tender Box located in the ground floor foyer of the Municipal Buildings, 166 KE Masinga Road (Old Fort Rd), Durban and an electronic submission via Ethekwini Supplier Portal (ESP). Notwithstanding the electronic submission, a tender offer will only be deemed valid if the "hard copy" submission has been made. The "hard copy" submission will be deemed to be the ruling version. Bidders are responsible for resolving all access rights and submission queries before the tender closing date. Tender closing date and time remain unchanged

Tenderers are required to be registered on the **National Treasury Central Supplier Database** (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture.

Registration on the **eThekwini Municipality's Database** can be done via website:
https://ethekwinivendor.durban.gov.za/ and on ESP**:**supplier.selfservice@durban.gov.za

Tenderers should ensure that tenders are delivered timeously to the correct address as stated in the Conditions of Tender. If a tender is late, it will not be accepted for consideration.

The Municipality will consider a tender submitted in response to this request for tender to be an offer from your company to perform the supply on the basis of that tender. Accordingly, please review the attached General and Special Terms and Conditions which will form the basis for any supply arrangement entered into between the Municipality and your company.

The Municipality is seeking tenders from potential suppliers only and makes no representation or promise in relation to procuring work from a supplier or supplier. The Municipality will not be responsible for any costs associated with preparing and submitting a tender.

The Municipality does not bind itself to accept the lowest or any tender. It reserves the right to accept the whole or any part of a tender to place orders. Bidders shall not bind the Municipality to any minimum quantity per order. The successful Tenderer (s) shall be bound to provide any quantities stipulated in the specification.

The successful tenderer will be required to fill in and sign a written Contract Form (MBD 7).

NB: NO TENDER WILL BE CONSIDERED FROM PERSONS IN THE SERVICE OF THE STATE
(as defined in Regulation 44 of the Local Government: Municipal Supply Chain Management Regulations).

THE FOLLOWING PARTICULARS MUST BE FURNISHED
(Failure to do so may result in your tender being disqualified)

Name of Tenderer: ……

Postal Address: ……

Street Address: ……

E-Mail Address: ……

Telephone Number:				-					-						
Cell phone Number:				-					-						
Facsimile Number:				-					-						

	Circle Applicable
Is your entity registered on the **eThekwini Municipality's supplier database**?	YES / NO
• **If YES insert** your PR Number: …….	**PR** …….
Is your entity registered on the **National Treasury Central Supplier Database** (CSD)?	YES / NO
• **If YES, insert** your MAAA Number: …….	**MAAA** …….
Insert a SARS Tax Compliance Status PIN	…….
Is your entity VAT registered?	YES / NO
• **If YES insert** Vat Registration Number: …….	…….
Has a **Declaration of Municipal Fees** been submitted?	YES / NO
Has a **Declaration of Interest** (MBD 4) been submitted?	YES / NO
Has a **Declaration for Procurement Above R10 Million** (MBD 5) been submitted?	YES / NO
Has a **Preference Points Claim** (MBD 6.1) been submitted?	YES / NO
Has a **Declaration of Bidder's Past SCM Practices** (MBD 8) been submitted?	YES / NO
Has a **Certificate of Independent Bid Determination** (MBD 9) been submitted?	YES / NO
Are you the accredited representative in South Africa for the goods / services / works offered? **If YES, enclose proof** at the back of the tender submission.	YES / NO

Signature of Tenderer: …… Date: ……

Name / Surname: …… (in block capitals)

Capacity under which this tender is signed: ……

SECTION 2 : CONDITIONS OF TENDER – (Goods / Services : June 2019)

INDEX

STANDARD CONDITIONS OF TENDER (Goods / Services)

1. DEFINITIONS

General:

(1) Defined words / phrases are printed in Italic font.
(2) Definitions apply to the singular as well as the plural.
(3) Any reference to the masculine gender shall be taken to include the feminine and any reference to the feminine gender shall be taken to include the masculine.
(4) The words "bid" and "tender", and "bidder" and "tenderer" can be used interchangeably.
(5) All definitions as defined in the ***General Conditions of Contract*** are applicable to these ***Standard Conditions of Tender***. These definitions include:

- "Closing time"
- "Contract"
- "Contract Price"
- "Corrupt practice"
- "Countervailing duties"
- "Country of origin"
- "Day"
- "Delivery"
- "Delivery ex stock"
- "Delivery into consignees store or to his site"
- "Dumping"
- "Force majeure"
- "Fraudulent practice"
- "GCC"
- "Goods"
- "Imported content"
- "Local content"
- "Manufacture"
- "Order"
- "Project site"
- "Purchaser"
- "Republic"
- "SCC"
- "Services"
- "Supplier"
- "Tort"
- "Turnkey"
- "Written" or "in writing"

(6) **Bid or Tender**: The offer submitted in respect of an invitation to submit such an offer.
(7) **Bidder or Tenderer**: An entity (company, close corporation, partnership, joint venture, sole proprietor) which submits a *bid/tender*.
(8) **Municipality**: The eThekwini Municipality, as represented by the duly authorised delegate, official or committee.
(9) **SCT:** Special Conditions of Tender (found in Section 3).
(10) **Week**: A period of seven (7) consecutive *days*.
(11) **Material Deviation**: A material deviation or qualification is one which, in the *Municipality's* opinion, would:
   (a) Detrimentally affect the scope, quality, or performance of the services or supply identified in the Scope;
   (b) Significantly change the *Municipality's* or the *Tenderer's* risks and responsibilities under the contract; or
   (c) Affect the competitive position of other *Tenderers* presenting responsive *tenders*, if it were to be rectified.

2. CONDITIONS OF TENDER & CONTRACT

The specification will be governed by the ***Standard Conditions of Tender*** (Goods and Services), ***Special Conditions of Tender (SCT)***, ***General Conditions of Contract (GCC)*** (Government Procurement General Conditions (July 2010), as amended by National Treasury Circular 52 dated 30 July 2010), the ***Special Conditions of Contract (SCC)***, the ***Occupational Health and Safety Act*** (Act No. 85 of 1993), and the ***eThekwini Code of Conduct***.

Complete Acceptance of Conditions

Unless otherwise expressly stipulated in a letter covering the *tender*, every *Tenderer* shall be deemed to have waived, renounced, and abandoned any conditions printed or written upon any stationery used for the purpose of, or in connection with, the submission of their *tender*, which are in conflict with the ***General Conditions of Contract*** and ***Special Conditions of Contract***. *Tenderers* are advised that any *material divergences / qualifications* from the official Conditions or Specification will render their *tenders* liable to disqualification.

3. TENDER INFORMATION

(1) **General**

(a) *Tenders* will be liable for rejection unless made out on the official tendering documentation.
(b) Any alterations effected upon any of the tendering documents must be clearly shown by means of a hand written (black, non-erasable ink), or typed, entry and must be signed in full by the *Tenderer*. **The use of correction fluid is not permitted**.
(c) *Tenderers* may submit alternative solutions that, in the *Tenderer's* opinion, are to the *Municipality's* advantage economically and technically. Full technical details of the alternative *tender(s)* shall be submitted with the tender documents. Alternative *tender(s)* shall be submitted separately.

(2) **Obtaining Tender Documentation**

All tenders must be submitted on official tender documentation issued, in electronic format, by the eThekwini Municipality. Electronically downloaded documentation (obtainable free of charge) should be printed and suitably bound by tenderer.

(3) **Queries Relating to this Tender**

Queries can be directed to the person / Department as stated in the ***SCT***.

(4) **Briefing Session (Clarification Meeting)**

Details of the briefing session are stated in the ***SCT***.
Failure to attend a compulsory briefing session will invalidate the *tender*. *Tenderers* must sign the attendance list in the name of the tendering entity. Tenders will only be evaluated from those tendering entities appearing on the attendance list.

(5) **Closing Date and Delivery of Tender Submissions**

Sealed *tenders* made out on the enclosed Official Tender Form, which shall be signed by or on behalf of the *Tenderer* , and addressed to the City Manager, marked with the appropriate Tender number, must be placed in the **Tender Box** as stated in the ***SCT*** not later than the **date and time** as stated in the ***SCT***, where after they will be opened publicly.

All tender documents **must** be placed directly into the Tender Box and should not be delivered to any other Municipal Department. *Bidders* are advised that *tenders* submitted by post, fax or email **will not** be considered. All couriered documents must be placed directly into the Tender Box and should not be delivered to any other Municipal Department.

Any *tender* received after the closing date and time stated for the receipt thereof **shall not** be accepted for consideration and shall be returned to the *Tenderer*.

(6) **Tender Validity and Withdrawal of Tenders**

Tenders must hold good until 16:00 of the 5th week following the date on which *tenders* are opened, or during such other period as may be specified in the ***SCT***. The *Municipality* may, during the period for which *tenders* are to remain open for acceptance, authorize a *Tenderer* to withdraw their *tender* in whole or in part on condition that the *Tenderer* pays to the *Municipality* on demand, a sum of one thousand Rand (R1,000.00). The *Municipality* may, if it thinks fit, waive payment of such sum in whole or in part.

4. **RETURNABLE SCHEDULES, FORMS, CERTIFICATES**

Each *Tenderer* shall complete fully and accurately the following documents and submit these documents with the *tender*:

(1) **Authority of Signatory:** In terms of Clause 4(5)(c) of the Conditions of Tender.

(2) **Tax Compliance Status PIN / Tax Clearance Certificate:** SARS has introduced a new Tax Compliance Status System. Tenderers can submit a Tax Compliance Status PIN (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status.

(3) **Declaration of Municipal Fees:** Only those *Bidders* whose municipal fees are fully paid, or those that have concluded acknowledgement of debt agreements with the *Municipality*, are eligible to *tender*.

All Bidders must sign the Declaration of Municipal Fees returnable form, declaring that their municipal fees are in order or that acknowledgement of debt agreements have been concluded, and include the relevant account numbers in the declaration. Failure to include account numbers or sign will invalidate the *tender*. The completion of the declaration is also applicable to *Bidders* outside of the eThekwini Municipal Area.

(4) **Declaration with respect to the Occupational Health and Safety Act:** Acceptance of undertaking in terms of the Occupational Health and Safety Act (Act 85 of 1993) and the relevant Regulations.

(5) **Municipal Biding Documents** (which includes):

(a) **MBD 4:** Declaration of Interest: All Bidders are to sign the Declaration of Interest wherein they declare any relationship that may exist with an official of the Municipality involved in the evaluation process.

Regulation 44 of the Supply Chain Management Regulations states that a Municipality or Municipal Entity may not make any award to a person:

(i) Who is in the service of the state;
(ii) If that person is not a natural person, of which any Director, Manager, Principal, Shareholder or Stakeholder is a person in the service of the state; or
(iii) Who is an advisor or consultant contracted with the Municipality or municipal entity.

Should a contract be awarded, and it is subsequently established that Regulation 44 has been breached, the Municipality shall have the right to terminate the contract with immediate effect.

(b) **MBD 5:** Declaration for Procurement Above R10 Million (if applicable): For all procurement expected to exceed R10 million (all applicable taxes included), tenderers must complete this questionnaire.

(c) **MBD 6.1**: Preference Points Claim Form: For the awarding of Preference Points, Bidders are required to complete the attached MBD 6.1 form and return it with their tender submission. Failure on the part of a tenderer to complete and submit this form will be interpreted to mean that preference points for **Specific Goals** are not claimed.

The Municipality reserves the right to require of a tenderer, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the Municipality.

(d) **MBD 8**: Declaration of Bidders Past Supply Chain Management Practices Form: This form serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

(e) **MBD 9**: Certificate of Independent Bid Determination: Section 4(1)(b)(iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms if it involves collusive tendering or tender rigging. In order to give effect to this, the Certificate of Bid Determination must be completed and submitted with the tender.

(5) **Official Tender Form** (see Section 9)

(a) Legal Status of Tenderer
It is essential for the purpose of entering into a legal contract that *Bidders* state on the Official Tender Form, under "Name and Address of Tenderer ", their full legal status:
(i) the full registered name of the company making a *tender*; or
(ii) if the *Tenderer* is a person conducting business under a recognised trading name then:
- State the name of the person(s);
- State recognised trading name; and
- State whether an owner, co-owner, proprietor, etc.

(b) **Signing of Official Tender Form**
Failure of a *Tenderer* to complete, in its entirety, and sign the Official Tender Form will invalidate the *tender*.

(c) **Authority of Signatory**
Bidders are to complete and sign the Authority of Signatory returnable document, and attach the required additional documents.

(d) **Differences or Discrepancies**
Should there be any difference or discrepancy between the prices or price contained in the Official Tender Form and those contained in any covering letter from the Tenderer, the prices or price contained in the Official Tender Form shall prevail.

(6) **Any additional Schedules, Forms, or Certificates as stated in the *SCT*.**

5. **INFORMATION TO BE SUPPLIED REGARDING SUB-CONTRACTORS**

Bidders are to state in their *tenders*, or covering letters, whether, if the contract were to be awarded to them, the whole of the work would be executed by them in their own workshop / factory. If the answer is in the negative, they are required to state which part(s) would be handed to sub-contractors and the name and address of such sub-contractors.

6. **SAMPLES**

Bidders may be required to state where samples of the full range of products can be inspected or be required to submit samples for inspection prior to the closing date of the *tender*.

7. **MANUFACTURERS**

The names of the manufacturers of the goods or equipment offered must be stated in the *tender*.

Bidders who are not manufacturers, accredited distributors, or agents must provide a valid agreement / Joint Venture Agreement, entered into with the manufacturer, accredited distributors, or agents, with their submission. This agreement must meet all the requirements as laid down in the *tender* document, and must cover the contract period.

8. **CLARIFICATION**

The Head: Supply Chain Management Unit, or an authorized representative, may request clarification or further information on any aspect of the *tender*. The *Tenderer* **must** supply the requested information within the time specified. Failure to comply will render the *tender* non-responsive.

9. **PRICING**

Bidders would be precluded from this *tender* if their pricing structure deviates from the Official Tender Form.

(1) **Nett Prices**
All prices shall be quoted in South African currency (Rand) after deduction of any brokerage or discount allowed to the Municipality.

(2) **Unit Prices**
Bidders shall quote only one price in respect of each item. Such price is to hold good for the full duration of the contract period, being subject to variation only in accordance with specified criteria, as stated in the ***Conditions of Contract***.

(3) **Firm Tenders**
Bidders may submit firm prices for each 12 month period. These prices shall be free from all fluctuations, including any statutory increases.

(4) **Value Added Tax (V.A.T)**
Prices exclusive and inclusive of VAT must be stated separately on the Official Tender Form.

10. **ESTIMATED QUANTITIES**

The estimated quantities are set out in Section 8 : Bill of Quantities / Schedule of Rates/Activities which forms part of the official tender documents. The quantities are stated purely for the information of the *Bidders* and are in order to ascertain an estimated total contract price. The *Supplier* will, however, be bound to supply whatever quantity or quantities the *Municipality* may actually require, and may exceed, or be less than, the estimated quantities stated.

11. **DELIVERY, RISK, PACKAGES, ETC**

(1) Unless otherwise provided, all goods are to be supplied only against the form of order issued by the *Municipality*.
(2) *Bidders* shall quote a unit price which shall include delivery to the specified delivery point, as stated in the ***SCT.***
(3) The risk in all goods purchased by the *Municipality* under the contract shall remain with the *Supplier* until such goods shall have been duly delivered.
(4) *Bidders* shall clearly state the period within which delivery will be made after receipt of the official order, as this may be material in the adjudication of the *tender*.

12. **RATES OF EXCHANGE**

(1) Where the goods are imported the *Supplier* shall, within seven days of date of official Purchase Order, arrange through their bankers for the foreign commitment to be covered forward down to the Rand in order to fix the rate of exchange. The *Supplier* shall notify the *Municipality* as soon as possible thereafter regarding the rate which has been fixed on such forward exchange.

Any increase or decrease between the basic rate of exchange as at a date seven days prior to the date of closing of *tenders* and that existing at the date of establishment of the forward exchange cover within the period stipulated above shall be paid or deducted by the Municipality. Upon the failure of the *Supplier* to arrange forward exchange cover, the *Supplier* shall be liable should there be any increase in the basic rate of exchange occurring after the last mentioned date.

The bank charges incurred in obtaining the forward exchange cover shall be for the *Municipality's* account.

(2) The *Supplier* shall on request:
(a) Submit documentary proof of the rate of exchange; and
(b) When an adjustment is claimed in terms of this sub-clause, whether by the *Supplier* or the *Municipality*, submit documentary proof to the satisfaction of the Deputy City Manager: Treasury in respect of such claim.

13. **IMPORT PERMITS**

(1) In order to minimise special importation, *Bidders* should, where possible, have recourse to local suppliers and / or manufacturers.
(2) *Bidders* must state whether their *tender* is dependent upon the issue of a special import permit or whether they are able to supply the goods by making use of the import facilities available to them.
(3) In the event of a tender being dependent upon the issue of a special import permit, application for such special import permit shall be made by the Tenderer , unless otherwise provided for in the ***SCT***.

14. **EVALUATION PROCESS**

The procedure for evaluation of responsive Tender Offers will be in accordance with the eThekwini Municipality's current SCM Policy and the Preferential Procurement Policy Framework Act (5 of 2000), and the Preferential Procurement Policy Framework Act Regulations (November 2022).

Details of additional evaluation criteria, if applicable, are stated in the *SCT*.

Evaluation points for price and preference will only be calculated for *Bidders* who comply with the contractual and technical specification, and if applicable, have attained the minimum Functionality Score as stated in the ***SCT***.

The evaluation process of responsive *tenders* will be as follows:

- Score each *tender* in respect of the financial offer made and preferences claimed (if any);
- Calculate the total number of evaluation points (T_{EV}) in accordance with the following formula:
  $T_{EV} = N_{FO} + N_P$ where: N_{FO} : is the number of evaluation points awarded for the financial offer; and N_P : is the number of evaluation points awarded for preferences claimed.
- Rank *tenders* from the highest number of evaluation points to the lowest.
- Recommend the *Tenderer* with the highest number of evaluation points for the award of the contract, unless there are compelling and justifiable reasons not to do so.
- Rescore and re-rank all *Bidders* should there be compelling and justifiable reasons not to recommend the *Tenderer* with the highest number of evaluation points, and recommend the *Tenderer* with the highest number of evaluation points, unless there are compelling and justifiable reasons not to do so, and the process set out in this sub-clause is repeated.

(1) **Evaluation points awarded for the financial offer:**

Reference is to be made to the Special Conditions of Tender (***SCT)***, and returnable form 5(c) in Section 4.

INCOME-GENERATING CONTRACTS

The financial offer will be scored using the formula:

$$N_{FO} = W\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

GOODS and SERVICES

The financial offer will be scored using the formula:

$$N_{FO} = W\left(1 - \frac{Pt - Pmin}{Pmin}\right)$$

Where the value of W is:

(a) **90** where the financial value inclusive of VAT of all responsive *tenders* received have a value in excess of R 50,000,000; OR
80 where the financial value inclusive of VAT of one or more responsive *tenders* offers have a value that equals or is less than R 50,000,000.
It is unclear (at the time of advertising) which of the two preference point systems applies. Either the 80/20 or 90/10 preference point system will apply, determined by the price offered by the lowest acceptable tender.

(b) **Pmax** is the comparative offer of the most favourable comparative offer (highest acceptable tender).

(c) **Pmin** is the comparative offer of the most favourable comparative offer (lowest acceptable tender).

(d) **Pt** is the comparative offer of the *tender* offer under consideration.

(2) **Evaluation points awarded for preference:**

The **Specific Goals** for Preference Points are specified in the ***SCT***.

15. **BRIBERY AND COMMUNICATION WITH COUNCILLORS / OFFICIALS**

(1) **Bribery**

No *Tenderer* shall offer, promise or give to any person or person connected with a *tender* or the awarding of a contract, any gratuity, bonus or discount etc, in connection with the obtaining of a contract.

(2) **Communication, Councillors and Officials**

A *Tenderer* shall not in any way communicate with a member of the *Municipality* or with any official of the *Municipality* on a question affecting any contract for the supply of goods or for any work, undertaking or services which is the subject of a *tender* during the period between the closing date for receipt of *tenders* and the dispatch of the written notification of the *Municipality's* decision on the award of the contract; provided that a *Tenderer* shall not hereby be precluded:

(a) At the request of the Head: SCM Unit, or an authorized representative, from furnishing him with additional information or with a sample or specimen for testing purposes or otherwise from giving a demonstration so as to enable the recommendation to the Bid Committee on the award of the contract to be formulated;

(b) From obtaining from the Head : SCM Unit, or an authorised representative, information as to the date upon which the award of the contract is likely to be made, or, after the decision upon the award has been made by the *Municipality* or any Committee to which the *Municipality* has delegated its powers, information as to the nature of the decision or such information as was publicly disclosed at the opening of *tenders* or from submitting to the Accounting Officer in writing any communication relating to their *tender* or the award of the contract or a request for leave to withdraw their *tender*; and

(c) Provided further that nothing contained herein shall be construed so as to prevent information being sought and obtained from an Official in regard to any decision taken at an open Municipal meeting, or any Committee to which the *Municipality* has delegated its powers.

A contravention of subsection (1) and / or (2), or an attempt to contravene such subsection, shall be reported to the Accounting Officer, who may on receipt of such report disqualify the *tender* of the *Tenderer* concerned.

16. **NEGOTIATIONS WITH PREFERRED BIDDERS**

The *Municipality* reserves the right to invoke Regulation 24 of Municipal Finance Management Act if required.

(1) The Accounting Officer may negotiate the final terms of a contract with *Bidders* identified through a competitive tendering process as preferred *Bidders*, provided that such negotiation:

- Does not allow any preferred *Tenderer* a second or unfair opportunity;
- Is not to the detriment of any other *Tenderer* ; and
- Does not lead to a higher price than the *tender* as submitted.

(2) Minutes of such negotiations must be kept for record purposes.

(3) Such negotiation may be delegated by the Accounting Officer.

17. **CANCELLATION OF TENDER PROCESS**

The municipality is entitled to cancel the tender at any time before the award of a tender and the decision to cancel the tender shall be published in the same manner in which the original tender invitation was advertised. The Municipality shall, in no way, be liable for any damages whatsoever, including, without limitation, damages for loss of profit, in any way connected with the cancellation of this bid.

18. **ACCEPTANCE OF BID**

(1) The *Municipality* does not bind itself to accept the lowest or any *tender*, and reserves the right to accept the whole or any part of a *tender* to place orders.

(2) The *Municipality* reserves the right to accept more than one technically and contractually compliant *tender* for part or the whole of the contract and to place orders on the price and availability.

(3) *Bidders* shall not bind the *Municipality* to any minimum quantity per order.

(4) The successful *Tenderer (s)* shall be bound to provide any quantities stipulated in the specification.

(5) Tenders will only be accepted on condition that:

(a) The *tender* is signed by a person authorised to sign on behalf of the *Tenderer* .

(b) A valid (at time of close of tenders), original, Tax Clearance Certificate OR Tax Compliance Status PIN is included with the *tender* submission. Both should have sufficient validity to ensure the process is adequately covered;

(c) A *Tenderer* who submitted their *tender* as a Joint Venture has included an acceptable Joint Venture Agreement and a B-BBEE Certificate pertaining to the Joint Venture with their *tender*.

(6) Financial Standing: The Head: Supply Chain Management reserves the right to require *Bidders* to submit evidence that their financial standing is adequate to meet their obligations under the contract should they be successful.

(7) Change of Ownership or Major Policy: Where it is known to a *Tenderer* that a change in ownership or major policy (of the tendering entity) will occur, or is likely to occur, during a specified contract period, the scope and effect thereof must be fully defined in a covering letter to be submitted with the *tender*.

(8) Purchase of Goods From Other Sources: Nothing contained in this contract shall be held to restrain the *Municipality* from purchasing from persons other than the *Supplier*, any of the goods described or referred to in this contract, if it shall in its discretion think fit to do so.

(9) Capability and Breach of Contract: Tenderers that do not have the capability of undertaking this enquiry in terms of the requirements of the contract or have been in breach of contract previously will not be considered.

19. **PAYMENT and FACTORING**

Payment conditions will be as per the ***Conditions of Contract***.

Payment will be made only to the *Supplier(s).* Factoring arrangements will not be accepted.

20 **APPEALS**

In terms of Regulation 49 of the Municipal Supply Chain Management Regulations persons aggrieved by decisions or actions taken by the *Municipality*, may lodge an appeal within 14 days of the decision or action, in writing to the *Municipality*. The appeal (clearly setting out the reasons for the appeal) and queries with regard to decision of award are to be directed to the office of the City Manager, attention:

Ms. S. Pillay, P.O. Box 1394, Durban, 4000;
eMail: Simone.Pillay@durban.gov.za.

SECTION 3: SPECIAL / ADDITIONAL CONDITIONS OF TENDER

3.1 SPECIAL CONDITIONS OF TENDER (SCT)

The ***Standard Conditions of Tender*** (Goods / Services) make several references to the ***Special Conditions of Tender*** *(SCT)* for details that apply specifically to this tender. The ***Special Conditions of Tender*** shall have precedence in the interpretation of any ambiguity or inconsistency between it and the ***Standard Conditions of Tender***.

Each item below is cross-referenced to the clause in the ***Standard Conditions of Tender*** to which it mainly applies.

SCT 3(1) TENDER INFORMATION: General

The tender document comprises of a cover page and 123 pages.

SCT 3(2) TENDER INFORMATION: Obtaining Tender Documentation

Documents are issued by the eThekwini Municipality electronic format.

Electronically downloaded documentation is obtainable from:

- the National Treasury's eTenders website
  - (https://www.etenders.gov.za/), or
- the eThekwini Municipality's website
  - (https://www.durban.gov.za/pages/business/procurement).

The entire document should be printed on A4 paper (one sided), and suitably bound by the tenderer.

SCT 3(3) TENDER INFORMATION: Queries Relating to this Tender

General and Contractual Queries are to be directed to:

Abel Malima; Tel: 031-311-9691; eMail: abel.malima@durban.gov.za

Technical Queries are to be directed to:

Bidders are requested to submit email queries related to the bid. All email queries are to be submitted by 2026-06-11 and Email questions and answers will be consolidated and posted on eTenders/Municipal website/Ethekwini Supplier Portal for the benefit of all Tenderers by 2026-06-18.

SCT 3(4) TENDER INFORMATION: Briefing Session

There will be no clarification meeting.

SCT 3(5) TENDER INFORMATION: Closing Date and Delivery of Tender Submissions

1. Tenderers are hereby advised to submit the following, no later than **Friday, *26 06 2026* at 11:00 am**:

   a) A signed **hard copy** of the Tender Document that is sealed, addressed to the City Manager and clearly marked with the Tender Number. This **hard copy** shall be deposited into the

Tender Box **located in the ground floor foyer of the Municipal Buildings at 166 KE Masinga Road (Old Fort Rd), Durban**; and

b) An **electronic copy** of the Tender Document, identical to that of the signed **hard copy**, via the eThekwini Municipality JDE System (ESP Module).

2. Notwithstanding the submission of the **electronic copy** of the Tender Document via the JDE System (SSS Module):

   a) The Tender Offer shall only be deemed valid if the **hard copy** submission has been made; and

   b) The **hard copy** submission shall take precedence and be utilised for the evaluation of Tenders.

3. In the event of any ambiguity or inconsistency within the **hard copy** submissions, eThekwini Municipality reserves the right to verify the information by comparing the **hard copy** with the corresponding **electronic copy**. Subsequently, if the **electronic copy** is found not to be identical to the **hard copy**, the Tender Offer shall be deemed invalid.

4. Tenderers shall ensure all access rights and submission queries related to the JDE system are resolved prior to the closing date.:

BID VIEWING, TENDER DOCUMENT DOWNLOAD AND BID SUBMISSION PROCESS

5. The following link must be followed for login, to view advertised bids, and to submit a bid advertised by eThekwini Municipality.

   https://rfq.durban.gov.za/jde/E1Menu.maf

   All queries related to the JDE system shall be directed to:

ESP Queries:Lindo Dlamini Tel: 031-3227133 / 031-3227153 Email: supplier.selfservice@durban.gov.za	**ESP Technical Queries**: Jabulane Chauke: Tel: 031 322 9535 Email: Jabulani.chauke@durban.gov.za

SCT 3(6) **TENDER INFORMATION: Tender Validity and Withdrawal of Tenders**

1. Tenders must remain valid for a period of 120 days following the date on which the Tenders are opened. This period is referred to as the **original validity period**.

2. In addition to the original validity period, Tenders must remain valid for acceptance for a further period of twelve (12) months, unless the Municipality is advised otherwise by the bidder in writing.

3. eThekwini Municipality reserves the right to request confirmation of Tender validity at any time during the twelve (12) month period.

SCT 4(6) **RETURNABLE SCHEDULES, FORMS, CERTIFICATES**

The additional returnable schedules, forms, which can be found in Section 10, are:

- Technical Schedules
- Tenderers Experience
- Experience of Key Staff

SCT 11(2) **DELIVERY, RISK, PACKAGES, ETC**

The specified delivery point is 1 Jelf Taylor Crescent, Durban, 4001.

SCT 13 **IMPORT PERMITS**

In the event of a tender being dependent upon the issue of a special import permit, application for such special import permit shall be made by:

- List name of applicant.

SCT 14 **EVALUATION PROCESS**

14.1 Price and Preference

The procedure for the evaluation of responsive tenders is **PRICE AND PREFERENCE** in accordance with the Employer's current SCM Policy, the Preferential Procurement Policy Framework Act (5 of 2000), and the Preferential Procurement Policy Framework Act Regulations (2022).

The **90/10** preference points system will be applied. The Formula used to calculate the **Price Points (max. 90)** will be according to that specified Regulation 5.1.

Reference is to be made to **Returnable Form: 5(c) MBD 6.1: Preference Points Claim .**

14.2 Broad-Based Black Economic Empowerment (SCM Policy Section 52.5)

The provisions of the SCM Policy: **Section 52.5: Broad-Based Black Economic Empowerment** shall apply. Reference is to be made to **Returnable Form: T2.2.6: MBD 6.1: Preference Points Claim**

A maximum of 10 tender evaluation Preference Points will be derived from points claimed for their B-BBEE Status Level of Contributor, as indicated on their B-BBEE Status Level Verification Certificates, on **Returnable Form: 5C: MBD 6.1**, in accordance with the table below.

90/10 Preference Points System	
B-BBEE Level Contributor	**Preference Points**
1	10
2	9
3	7
4	6
5	4
6	3
7	2
8	1
Non-Compliant	0

SCT 20 COMPLAINTS AND OBJECTIONS

In terms of Section 49 of the Ethekwini SCM Policy any person aggrieved by the decisions taken in the implementation of the SCM System may lodge within 14 days of notification, a written objection against the decision of the following:

The City Manager
Attention: Ms S Pillay **(E-Mail: Simone.Pillay@durban.gov.za)**
P O Box 1394
DURBAN
4000

Please be advised that any objection to this decision will only be processed upon receipt of a non-refundable administration fee of R1814.00 including VAT as stipulated in the municipality's SCM Policy approved on 30/09/2025 as well as the municipal budget for the financial year 2025/26. An objection will only be considered upon receipt of proof of payment of this fee. This amount must be paid into the following bank account as a real-time payment:

EThekwini Municipality
FNB – 631 6574 6331
Reference Number: *Please insert contract number*

3.2 ADDITIONAL CONDITIONS OF TENDER (ACT)

ACT 1 ELIGIBILITY – CSD REGISTRATION

Tenderers are required to be registered on the National Treasury Central Supplier Database (CSD) as a service provider. In the case of a Joint Venture, this requirement will apply individually to each party in the Joint Venture. Tenderers not so registered, at time of closing of tenders, will not be eligible to submit tenders.

The Tenderer's CSD Supplier Number (starting with "MAAA") is to be provided on the information table in Section 1.

Tenderers who wish to register on the CSD may do so via web address https://secure.csd.gov.za.

SECTION 4: RETURNABLE TENDER DOCUMENTS

The required returnable documents are as detailed in Section 2 (Clause 4): "Returnable Schedules, Forms, Certificates" of the Conditions of Tender / Special Conditions of Tender.

1) Authority of Signatory
2) Tax Compliance Status PIN / Tax Clearance Certificate
3) Declaration of Municipal Fees
4) Declaration with respect to The Occupational Health and Safety Act
5(a) MBD 4: Declaration of Interest
5(b) MBD 5: Declaration for Procurement Above R10 Million
5(c) MBD 6.1: Preference Points Claim
5(d) MBD 8: Declaration of Bidder's Past Supply Chain Management Practices
5(e) MBD 9: Certificate of Independent Bid Determination
6) Section 8: Bill of Quantities
7) Section 9: Official Tender Form
8) Section 10: Technical Schedules: Annexures A to H
9) Section 10: Annexure J: Tenderer's Experience
10) Section 10: Annexure K: Experience of Key Personnel
11) The tenderer must be an accredited service provider of **The Grid Operation Solution** offered and must attach an **accreditation letter** to this effect as per Section 10: Annexure L- Mandatory Criteria

The Tender Form can be found in Section 9: "Official Tender Form", and any additional schedules, forms, certificates can be found in Section 10: "Annexures".

1) AUTHORITY OF SIGNATORY

Reference is made to the Conditions of Tender: Clause 4(5)(c).

Indicate the status of the tenderer by ticking the appropriate box hereunder.

COMPANY		**CLOSE CORPORATION**		**PARTNERSHIP**		**JOINT VENTURE**		**SOLE PROPRIETOR**	
Refer to Notes at the bottom of the page									

I / We, the undersigned, being the Chairperson (Company), Member(s) (Close Corporation), Partners (Partnership), Sole Owner (Sole Proprietor), Lead Partner (JV), in the company / business trading as:

……

hereby authorise Mr/Mrs/Ms ……

acting in the capacity of .....

to sign all documents in connection with the tender for Contract No. **34611- 5E** and any contract resulting from it on our behalf.

NAME	ADDRESS	SIGNATURE	DATE

Notes

Tenderers are to include, at the back of their tender submission document, a printout of the following documents:

If a Company : a “Resolution of the Board” in this regard.
If a Joint Venture : a “Power of Attorney” signed by the legally authorised signatories of all the partners to the Joint venture.

2) TAX COMPLIANCE STATUS PIN / TAX CLEARANCE CERTIFICATE

SARS has introduced a new Tax Compliance Status System. Tenderers can submit a Tax Compliance Status PIN (TCS PIN) instead of an original Tax Clearance Certificate. This TCS PIN can be used by third parties to certify the taxpayer's real-time compliance status.

Separate Tax Clearance Certificates / TCS PINs are required for each entity in a Joint Venture.

The TCS PIN(s) are to be entered on the information table in **SECTION 1: GENERAL INFORMATION.**

Tenderers are to include, at the back of their tender submission document, a printout of their Tax Compliance Status PIN (TCS PIN) OR an original Tax Clearance Certificate.

Failure to include the required document will make the tender submission non-responsive.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): _____ **Date**

SIGNATURE: ---------- ----------

3) DECLARATION OF MUNICIPAL FEES

I, the undersigned, do hereby declare that the Municipal fees of

.....

(full name of Company / Close Corporation / partnership / sole proprietary/Joint Venture)

(hereinafter referred to as the TENDERER) are, as at the date hereunder, fully paid or an Acknowledgement of Debt has been concluded with the Municipality to pay the said charges in instalments.

The following account details relate to property of the said TENDERER:

Account	Account Number: to be completed by tenderer.
Consolidated Account No.	
Electricity	
Water	
Rates	
Other	

I acknowledge that should the aforesaid Municipal charges fall into arrears, the Municipality may take such remedial action as is required, including termination of any contract, and any payments due to the Contractor by the Municipality shall be first set off against such arrears.

- Where the TENDERER'S place of business or business interests are outside the jurisdiction of eThekwini Municipality, a copy of the accounts/agreements from the relevant municipality must be attached (to the back inside cover of this document).

- Where the tenderer's Municipal Accounts are part of their lease agreement, then a copy of the agreement, or official letter to that effect is to be attached (to the back inside cover of this document).

Tenderers are to be include, at the back of their tender submission document, a printout of the above account's and or agreements signed with the municipality.

Failure to include the required document will make the tender submission non-responsive.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____ ----------

4) DECLARATION WITH RESPECT TO THE OCCUPATIONAL HEALTH AND SAFETY ACT

Definitions

The Act: The Occupational Health and Safety Act No 85 of 1993 (as amended by the Occupational Health and Safety Amendment Act No 181 of 1993), and any associated / applicable Regulations.

Declaration by Tenderer

1. I, the undersigned, hereby declare and confirm that I am fully conversant with the Act.

2. I hereby declare that my company has the competence and the necessary resources to safely carry out the work / supply / services under this contract in compliance with the Act, and the Employer's / Purchaser's / Client's Health and Safety Specifications.

3. I hereby undertake, if my tender is accepted, to provide on request a suitable and sufficiently documented Health and Safety Plan which plan shall be subject to approval by the Employer / Purchaser / Client.

4. I hereby confirm that adequate provision has been made in my tendered rates to cover the cost of all resources, actions, training and all health and safety measures envisaged in the Act, and that I will be liable for any penalties that may be applied by the Employer / Purchaser / Client for failure to comply with the provisions of the Act.

5. I agree that my failure to complete and execute this declaration to the satisfaction of the Employer / Purchaser / Client will mean that I am unable to comply with the requirements of the Act and accept that my tender will be prejudiced and may be rejected at the discretion of the Employer / Purchaser / Client.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____ ----------

5(a) MBD 4: DECLARATION OF INTEREST

NOTES
MSCM Regulations: "**in the service of the state**" means to be:
(a) a member of:
  (i) any municipal council.
  (ii) any provincial legislature.
  (iii) the national Assembly or the national Council of provinces.
(b) a member of the board of directors of any municipal enterprise.
(c) an official of any municipality or municipal enterprise.
(d) an employee of any national or provincial department, national or provincial public enterprise or constitutional institution within the meaning of the Public Finance Management Act, 1999 (Act No.1 of 1999).
(e) a member of the accounting authority of any national or provincial public enterprise.
(f) an employee of Parliament or a provincial legislature.

"**Shareholder**" means a person who owns shares in the company and is actively involved in the management of the company or business and exercises control over the company.

1 No bid will be accepted from persons **in the service of the state.**

2 Any person, having a kinship with persons **in the service of the state**, including a blood relationship, may make an offer or offers in terms of this invitation to bid. In view of possible allegations of favouritism, should the resulting bid, or part thereof, be awarded to persons connected with or related to **persons in service of the state**, it is required that the bidder or their authorised representative declare their position in relation to the evaluating/adjudicating authority and/or take an oath declaring his/her interest.

3 In order to give effect to the above, the following questionnaire must be completed and submitted with the bid.

3.1 Name of enterprise	
Name of enterprise's representative	
3.2 ID Number of enterprise's representative	
3.3 Position enterprise's representative occupies in the enterprise	
3.4 Company Registration number	
3.5 Tax Reference number	
3.6 VAT registration number	

3.7 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated in paragraph 4 below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted.

	Circle Applicable	
3.8 Are you presently in the service of the state?	YES	NO

If yes, furnish particulars:
……

……

3.9 Have you been in the service of the state for the past twelve months?	YES	NO

If yes, furnish particulars:
……

……

3.10 Do you have any relationship (family, friend, other) with persons in the service of the state and who may be involved with the evaluation and or adjudication of this bid?	YES	NO

If yes, furnish particulars:

……

……

3.11 Are you, aware of any relationship (family, friend, other) between any other bidder and any persons in the service of the state who may be involved with the evaluation and or adjudication of this bid?	YES	NO

If yes, furnish particulars:

……

……

3.12 Are any of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO

If yes, furnish particulars:

……

……

3.13 Are any spouse, child or parent of the company's directors, trustees, managers, principle shareholders or stakeholders in service of the state?	YES	NO

If yes, furnish particulars:

……

……

3.14 Do you or any of the directors, trustees, managers, principle shareholders, or stakeholders of this company have any interest in any other related companies or business whether or not they are bidding for this contract ?	YES	NO

If yes, furnish particulars:

……

……

4 The names of all directors / trustees / shareholders / members / sole proprietors / partners in partnerships, their individual identity numbers and state employee numbers must be indicated below. In the case of a joint venture, information in respect of each partnering enterprise must be completed and submitted

Full Name	Identity No.	State Employee No.	Personal income tax No.
Use additional pages if necessary			

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): **Date**

SIGNATURE:

5(b) MBD 5: DECLARATION FOR PROCUREMENT ABOVE R10 MILLION
(ALL APPLICABLE TAXES INCLUDED)

For all procurement expected to exceed R10 million (all applicable taxes included), bidders must complete the following questionnaire.

		Circle Applicable	
1.0	Are you by law required to prepare annual financial statements for auditing?	YES	NO
1.1	**If YES, submit audited annual financial statements for the past three years or since the date of establishment if established during the past three years.**		
2.0	Do you have any outstanding undisputed commitments for municipal services towards any municipality for more than three months or any other service provider in respect of which payment is overdue for more than 30 days?	YES	NO
2.1	If NO, this serves to certify that the bidder has no undisputed commitments for municipal services towards any municipality for more than three months or other service provider in respect of which payment is overdue for more than 30 days.		
2.2	If YES, provide particulars.		
	…….		
	…….		
3.0	Has any contract been awarded to you by an organ of state during the past five years, including particulars of any material non-compliance or dispute concerning the execution of such contract?	YES	NO
3.1	If YES, provide particulars.		
	…….		
	…….		
4.0	Will any portion of goods or services be sourced from outside the Republic, and, if so, what portion and whether any portion of payment from the municipality / municipal entity is expected to be transferred out of the Republic?	YES	NO
4.1	If YES, provide particulars.		
	…….		
	…….		

If required by 1.1 above, tenderers are to include, at the back of their tender submission document, a printout of their audited annual financial statements.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and, if required, that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ..... **Date** .....

SIGNATURE: .....

5(c) MBD 6.1: PREFERENCE POINTS CLAIM) (SCMP 52.5: Broad-Based Black Economic Empowerment)

This form serves as a claim form for preference points for **Broad-Based Black Economic Empowerment (B-BBEE) Status Level of Contribution**. **Reference is to be made to the Special Conditions of tender: SCT 14**

1.0 GENERAL CONDITIONS

1.1 The relevant **Preference Points System (80/20 or 90/10)** applicable to this bid is stated in the **Special Conditions of tender: SCT 14**

1.2 Failure on the part of a bidder to fill in and/ or sign this form, and submit a B-BBEE Verification Certificate from a Verification Agency accredited by the South African Accreditation System (SANAS), or a Registered Auditor approved by the Independent Regulatory Board of Auditors (IRBA), or sworn affidavits in the case of Exempted Mico Enterprises or Qualifying Small Enterprises, together with the bid, will be interpreted to mean that preference points for **B-BBEE Status Level Of Contribution** are not claimed.

1.3 The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to preferences, in any manner required by the purchaser.

2.0 ADJUDICATION USING A POINT SYSTEM

2.1 The bidder obtaining the highest number of total points will be recommended for the award of the contract.

2.2 Preference points shall be calculated after prices have been brought to a+ comparative basis taking into account all factors of non-firm prices and all unconditional discounts.

2.3 Points scored will be rounded off to the nearest 2 decimal places.

2.4 In the event that two or more bids have scored equal total points, the successful bid must be the one scoring the highest number of preference points for B-BBEE.

2.5 However, when functionality is part of the evaluation process and two or more bids have scored equal points including equal preference points for B-BBEE, the successful bid must be the one scoring the highest score for functionality.

2.6 Should two or more bids be equal in all respects the award shall be decided by the drawing of lots.

3.0 POINTS AWARDED FOR PRICE

A maximum of 80 or 90 points is allocated for price on the following basis:

80/20 Procurement System **or** **90/10 Procurement System**

$$Ps = 80\left(1 - \frac{Pt - P\min}{P\min}\right) \qquad Ps = 90\left(1 - \frac{Pt - P\min}{P\min}\right)$$

Where: Ps = Points scored for comparative price of bid under consideration
Pt = Comparative price of bid under consideration
Pmin = Comparative price of lowest acceptable bid

4.0 POINTS ALLOCATED FOR B-BBEE STATUS LEVEL OF CONTRIBUTION

4.1 Preference points must be claimed by a bidder for attaining the **B-BBEE Status Level of Contribution** in accordance with the applicable table below:

80/20 Preference Points System	
B-BBEE Level Contributor	**Preference Points**
1	20
2	18
3	14
4	12
5	8
6	6
7	4
8	2
Non-Compliant	0

90/10 Preference Points System	
B-BBEE Level Contributor	**Preference Points**
1	10
2	9
3	7
4	6
5	4
6	3
7	2
8	1
Non-Compliant	0

4.2 All bidders must submit **B-BBEE Status Level of Contribution Certificates**, issued by either verification agencies accredited by the South African Accreditation System (SANAS), or by registered auditors approved by the Independent Regulatory Board for Auditors (IRBA), or sworn affidavits in a case of an Exempted Micro Enterprise (EME) or a Qualifying Small Enterprise (QSE).

4.3 Any enterprise with an annual Total Revenue of R 10 million or less qualifies as an Exempted Micro-Enterprise.

4.4 Exempted Micro-Enterprises are deemed to have B-BBEE Status of "Level Four Contributor" having a B-BBEE procurement recognition of 100% in terms of the Codes of Good Practice.

4.5 An Exempted Micro Enterprise (EME) with at least 51% black ownership qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.6 An Exempted Micro Enterprise with 100% black ownership qualifies as a Level 1 contributor with BBBEE level of 135% in terms of the Codes of Good Practice.

4.7 An Exempted Micro Enterprise that is regarded as a specialized enterprise with at least 75% black beneficiaries qualifies as a Level 1 contributor with BBBEE level of 135% in terms of the Codes of Good Practice.

4.8 An Exempted Micro Enterprise that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.9 A Qualifying Small Enterprise (QSE) with at least 51% black ownership qualifies as a Level 2 contributor.

4.10 A QSE with 100% black ownership qualifies as a Level 1 contributor.

4.11 A QSE that is regarded as a specialized enterprise with at least 51% black beneficiaries qualifies as a Level 2 contributor with BBBEE level of 125% in terms of the Codes of Good Practice.

4.12 A QSE with less than 51% black ownership is required to submit a BBBEE level verification certificate issued by a BBBEE verification professional.

4.13 A Trust, consortium or joint venture:

(a) must submit a B-BBEE status level certificate in order to qualify for points;
(b) may qualify for points as an unincorporated entity provided, that they submit their consolidated scorecard is prepared for separate tender; and
(c) where no consolidated scorecard exists, the weighted average (in accordance with participation percentages) must be used and rounded off to the nearest status level.

4.14 Gazetted Sector Codes supersede Generic Codes.

5.0 SUB-CONTRACTING

5.1 B-BBEE points must not be awarded to a tenderer who intends sub-contracting more than 25% of the value of the contract to an enterprise that does not qualify for at least the points that such contractor qualifies for, unless the intended sub-contractor is an EME who has the ability and capability to execute the contract.

5.2 A person awarded a contract may not sub-contract more than 25% of the value of the contract to an enterprise that does not have an equal or higher B-BBEE status level, unless the intended sub-contractor is an EME who has the ability and capability to execute the contract.

5.3 A person awarded a contract in relation to a designated sector may not sub-contract in such a manner that the **Local Production and Content** of the overall value of the contract is reduced to below the prescribed minimum threshold.

6.0 BID DECLARATION

6.1 Bidders who wish to claim points in respect of **B-BBEE Status Level of Contribution** must complete the following:

B-BBEE Status Level of Contribution	Tenderer's Preference Points Claim (maximum of 10 points)
Points claimed must be in accordance with the relevant table reflected in paragraph 4.1 and must be substantiated by means of a B-BBEE Status Level of Contribution Certificate issued by a verification agency accredited by the South African Accreditation System (SANAS), or by registered auditors approved by the Independent Regulatory Board for Auditors (IRBA), or sworn affidavits in a case of an Exempted Micro Enterprise (EME) or a Qualifying Small Enterprise (QSE).	

Tenderers are to include, at the back of their tender submission, their B-BBEE Status Level of Contribution Certificate.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct, ***and, if required, that the requested documentation has been included in the tender submission****.*

NAME (Block Capitals): ..... **Date** .....

SIGNATURE: .....

5(c) MBD 6.1: PREFERENCE POINTS CLAIM
In terms of THE PREFERENTIAL PROCUREMENT REGULATIONS (2022)

This preference form must form part of all tenders invited. It contains general information and serves as a claim form for preference points for specific goals.

NB: BEFORE COMPLETING THIS FORM, TENDERERS MUST STUDY THE GENERAL CONDITIONS, DEFINITIONS AND DIRECTIVES APPLICABLE IN RESPECT OF THE TENDER AND PREFERENTIAL PROCUREMENT REGULATIONS, 2022

1.0 GENERAL CONDITIONS

1.1 The following preference point systems are applicable to invitations to tender:

- the 80/20 system for requirements with a Rand value of up to R50 000 000 (all applicable taxes included).
- the 90/10 system for requirements with a Rand value above R50 000 000 (all applicable taxes included).

1.2 **Either the 80/20 or 90/10 preference point system** will be applicable in this tender. The lowest/ highest acceptable tender will be used to determine the applicable system once tenders are received.

1.3 Preference Points for this tender shall be awarded for:

- **Price** and **Specific Goals**: Either 80 or 90 (price) and 20 or 10 (specific goals), in terms of 1.2 above.
- The total Preference Points, for Price and Specific Goals, is 100.

1.4 Failure on the part of the tenderer to submit the required proof or documentation, in terms of the requirements in the (Special) Conditions of Tender for claiming **Specific Goal** preference points, will be interpreted that preference points for **Specific Goals** are not claimed.

1.5 The Municipality reserves the right to require of a tenderer, either before a tender is adjudicated or at any time subsequently, to substantiate any claim in regard of preferences, in any manner required by the Municipality.

2.0 DEFINITIONS

2.1 "**tender**" means a written offer in the form determined by an organ of state in response to an invitation to provide goods or services through price quotations, competitive tendering process or any other method envisaged in legislation.

2.2 "**price**" means an amount of money tendered for goods or services, and includes all applicable taxes less all unconditional discounts.

2.3 "**rand value**" means the total estimated value of a contract in Rand, calculated at the time of bid invitation, and includes all applicable taxes.

2.4 "**tender for income-generating contracts**" means a written offer in the form determined by Municipality in response to an invitation for the origination of income-generating contracts through any method envisaged in legislation that will result in a legal agreement between the Municipality and a third party that produces revenue for the Municipality, and includes, but is not limited to, leasing and disposal of assets and concession contracts, excluding direct sales and disposal of assets through public auctions.

2.5 "**the Act**" means the Preferential Procurement Policy Framework Act, 2000 (Act No. 5 of 2000).

3.0 FORMULA FOR CALCULATION OF PREFERENCE PRICE POINTS

3.1 PROCUREMENT OF GOODS AND SERVICES

PRICE POINTS: A maximum of 80 or 90 points is allocated for price on the following basis:

90 / 10 Points System

$$Ps = 90\left(1 - \frac{Pt - Pmin}{Pmin}\right)$$

Where:
Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmin = Price of lowest acceptable tender

3.2 DISPOSAL OR LEASING OF STATE ASSETS AND INCOME GENERATING PROCUREMENT

PRICE POINTS: A maximum of 80 or 90 points is allocated for price on the following basis:

80 / 20 Points System

$$Ps = 80\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

OR

90 / 10 Points System

$$Ps = 90\left(1 + \frac{Pt - Pmax}{Pmax}\right)$$

Where:
Ps = Points scored for price of tender under consideration
Pt = Price of tender under consideration
Pmax = Price of highest acceptable tender

4.0 POINTS AWARDED FOR SPECIFIC GOALS

4.1 In terms of Regulation 4(2); 5(2); 6(2) and 7(2) of the Preferential Procurement Regulations, preference points must be awarded for specific goals stated in the tender. For the purposes of this tender the tenderer will be allocated points based on the **points claimed** for the goal(s) stated in **Table 1** below, as supported by proof/ documentation stated in the **Conditions of Tender**:

4.2 In cases where the municipality intends to use Regulation 3(2) of the Regulations, which states that if it is unclear whether the 80/20 or 90/10 preference point system applies, the municipality must, in the tender documents, stipulate in the case of:

(a) an invitation for tender for income-generating contracts, that either the 80/20 or 90/10 preference point system will apply and that the highest acceptable tender will be used to determine the applicable preference point system, or
(b) any other invitation for tender, that either the 80/20 or 90/10 preference point system will apply and that the lowest acceptable tender will be used to determine the applicable preference point system,

then the municipality must indicate the points allocated for specific goals for both the 90/10 and 80/20 preference point system.

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, certify that the points claimed, based on the specific goals as specified in the tender, qualifies the tendering entity for the preference(s) shown.

I acknowledge that:

1) The information furnished is true and correct.

2) The preference points claimed are in accordance with the General Conditions as indicated in paragraph 1 of this form.klkj

3) In the event of a contract being awarded as a result of points claimed as shown in paragraphs 1.4 and 4.2, the contractor may be required to furnish documentary proof to the satisfaction of the organ of state that the claims are correct.

4) If the specific goals have been claimed or obtained on a fraudulent basis, or any of the conditions of contract have not been fulfilled, the organ of state may, in addition to any other remedy it may have:

   (a) disqualify the person from the tendering process.
   (b) recover costs, losses or damages it has incurred or suffered as a result of that person's conduct.
   (c) cancel the contract and claim any damages which it has suffered as a result of having to make less favourable arrangements due to such cancellation.
   (d) recommend that the tenderer or contractor, its shareholders and directors, or only the shareholders and directors who acted on a fraudulent basis, be restricted from obtaining business from any organ of state for a period not exceeding 10 years, after the *audi alteram partem* (hear the other side) rule has been applied; and
   (e) forward the matter for criminal prosecution, if deemed necessary.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____ ----------

5(d) MBD 8: DECLARATION OF BIDDER'S PAST SUPPLY CHAIN MANAGEMENT PRACTICES

1.0 This Municipal Bidding Document must form part of all bids invited.

2.0 It serves as a declaration to be used by municipalities and municipal entities in ensuring that when goods and services are being procured, all reasonable steps are taken to combat the abuse of the supply chain management system.

3.0 The bid of any bidder may be rejected if that bidder, or any of its directors have:

   a) abused the municipal entity's supply chain management system or committed any improper conduct in relation to such system.
   b) been convicted for fraud or corruption during the past five years.
   c) wilfully neglected, reneged on or failed to comply with any government, municipal or other public sector contract during the past five years.
   d) been listed in the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004).

4.0 In order to give effect to the above, the following questions must be completed and submitted with the bid.

Circle Applicable

4.1	Is the bidder or any of its directors listed on the National Treasury's Database of Restricted Suppliers as companies or persons prohibited from doing business with the public sector? (Companies or persons who are listed on this Database were informed in writing of this restriction by the Accounting Officer / Authority of the institution that imposed the restriction after the audi alteram partem rule was applied.) The Database of Restricted Suppliers now resides on the National Treasury's website (www.treasury.gov.za) and can be accessed by clicking on its link at the bottom of the home page.	YES	NO

4.1.1 If YES, provide particulars.

……

……

4.2	Is the bidder or any of its directors listed on the Register for Tender Defaulters in terms of section 29 of the Prevention and Combating of Corrupt Activities Act (No 12 of 2004)? The Register for Tender Defaulters can be accessed on the National Treasury's website (www.treasury.gov.za) by clicking on its link at the bottom of the home page.	YES	NO

4.2.1 If YES, provide particulars.

……

……

4.3	Was the bidder or any of its directors convicted by a court of law (including a court of law outside the Republic of South Africa) for fraud or corruption during the past five years?	YES	NO

4.3.1 If YES, provide particulars.

……

……

4.4	Does the bidder or any of its directors owe any municipal rates and taxes or municipal charges to the municipality / municipal entity, or to any other municipality / municipal entity, that is in arrears for more than three months?	YES	NO

4.4.1 If YES, provide particulars.

……

……

4.5 Was any contract between the bidder and the municipality / municipal entity or any other organ of state terminated during the past five years on account of failure to perform on or comply with the contract?	YES	NO

4.5.1 If YES, provide particulars.

……

……

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

I accept that, in addition to cancellation of a contract, action may be taken against me should this declaration prove to be false.

NAME (Block Capitals): **Date**

SIGNATURE:

5(e) MBD 9: CERTIFICATE OF INDEPENDENT BID DETERMINATION

NOTES

[1] Includes price quotations, advertised competitive bids, limited bids and proposals.

[2] Bid rigging (or collusive bidding) occurs when businesses, that would otherwise be expected to compete, secretly conspire to raise prices or lower the quality of goods and / or services for purchasers who wish to acquire goods and / or services through a bidding process. Bid rigging is, therefore, an agreement between competitors not to compete.

[3] Joint venture or Consortium means an association of persons for the purpose of combining their expertise, property, capital, efforts, skill and knowledge in an activity for the execution of a contract.

1.0 This Municipal Bidding Document (MBD) must form part of all **bids**[1] invited.

2.0 Section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, prohibits an agreement between, or concerted practice by, firms, or a decision by an association of firms, if it is between parties in a horizontal relationship and if it involves collusive bidding (or **bid rigging**).[2] Collusive bidding is a *pe se* prohibition meaning that it cannot be justified under any grounds.

3.0 Municipal Supply Regulation 38 (1) prescribes that a supply chain management policy must provide measures for the combating of abuse of the supply chain management system, and must enable the accounting officer, among others, to:

a. take all reasonable steps to prevent such abuse;
b. reject the bid of any bidder if that bidder or any of its directors has abused the supply chain management system of the municipality or municipal entity or has committed any improper conduct in relation to such system; and
c. cancel a contract awarded to a person if the person committed any corrupt or fraudulent act during the bidding process or the execution of the contract.

4.0 This MBD serves as a certificate of declaration that would be used by institutions to ensure that, when bids are considered, reasonable steps are taken to prevent any form of **bid rigging**.

5.0 In order to give effect to the above, the attached Certificate of Bid Determination (MBD 9) must be completed and submitted with the bid.

CERTIFICATE OF INDEPENDENT BID DETERMINATION

I, the undersigned, in submitting the accompanying bid:

(Bid Number and Description)

in response to the invitation for the bid made by:

(Name of Municipality / Municipal Entity)

do hereby make the following statements that I certify to be true and complete in every respect.

I certify, on behalf of:

(Name of Bidder)

that:

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

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

3. I am authorized by the bidder to sign this Certificate, and to submit the accompanying bid, on behalf of the bidder;

4. Each person whose signature appears on the accompanying bid has been authorized by the bidder to determine the terms of, and to sign, the bid, on behalf of the bidder;

5. For the purposes of this Certificate and the accompanying bid, I understand that the word “competitor” shall include any individual or organization, other than the bidder, whether or not affiliated with the bidder, who:
   (a) has been requested to submit a bid in response to this bid invitation.
   (b) could potentially submit a bid in response to this bid invitation, based on their qualifications, abilities or experience.
   (c) provides the same goods and services as the bidder and/or is in the same line of business as the bidder.

6. The bidder has arrived at the accompanying bid independently from, and without consultation, communication, agreement, or arrangement with any competitor. However, communication between partners in a joint venture or consortium[3] will not be construed as collusive bidding.

7. In particular, without limiting the generality of paragraphs 6 above, there has been no consultation, communication, agreement or arrangement with any competitor regarding:
   (a) prices.
   (b) geographical area where product or service will be rendered (market allocation).
   (c) methods, factors or formulas used to calculate prices.
   (d) the intention or decision to submit or not to submit, a bid.
   (e) the submission of a bid which does not meet the specifications and conditions of the bid.
   (f) bidding with the intention not to win the bid.

8. In addition, there have been no consultations, communications, agreements, or arrangements with any competitor regarding the quality, quantity, specifications and conditions or delivery particulars of the products or services to which this bid invitation relates.

9. The terms of the accompanying bid have not been, and will not be, disclosed by the bidder, directly or indirectly, to any competitor, prior to the date and time of the official bid opening or of the awarding of the contract.

10. I am aware that, in addition and without prejudice to any other remedy provided to combat any restrictive practices related to bids and contracts, bids that are suspicious will be reported to the Competition Commission for investigation and possible imposition of administrative penalties in terms of section 59 of the Competition Act No 89 of 1998 and or may be reported to the National Prosecuting Authority (NPA) for criminal investigation and or may be restricted from conducting business with the public sector for a period not exceeding ten (10) years in terms of the Prevention and Combating of Corrupt Activities Act No 12 of 2004 or any other applicable legislation.

NAME (Block Capitals): ---------- **Date**

SIGNATURE: _____ ----------

SECTION 5: CONDITIONS OF CONTRACT

GOVERNMENT PROCUREMENT: CONDITIONS OF CONTRACT (July 2010)

The ***Conditions of Contract*** are the ***General Conditions of Contract*** as published by the National Treasury titled "Government Procurement: General Conditions of Contract (July 2010), as amended by National Treasury Circular 52 dated 30 July 2010, hereinafter referred to as ***GCC***.

THE NATIONAL TREASURY

Republic of South Africa

GOVERNMENT PROCUREMENT:

GENERAL CONDITIONS OF CONTRACT

July 2010

TABLE OF CLAUSES

1. Definitions

The following terms shall be interpreted as indicated:

1.1 "Closing time" means the date and hour specified in the bidding documents for the receipt of bids.

1.2 "Contract" means the written agreement entered into between the purchaser and the supplier, as recorded in the contract form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.

1.3 "Contract price" means the price payable to the supplier under the contract for the full and proper performance of his contractual obligations.

1.4 "Corrupt practice" means the offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution.

1.5 "Countervailing duties" are imposed in cases where an enterprise abroad is subsidized by its government and encouraged to market its products internationally.

1.6 "Country of origin" means the place where the goods were mined, grown or produced or from which the services are supplied. Goods are produced when, through manufacturing, processing or substantial and major assembly of components, a commercially recognized new product results that is substantially different in basic characteristics or in purpose or utility from its components.

1.7 "Day" means calendar day.

1.8 "Delivery" means delivery in compliance of the conditions of the contract or order.

1.9 "Delivery ex stock" means immediate delivery directly from stock actually on hand.

1.10 "Delivery into consignees store or to his site" means delivered and unloaded in the specified store or depot or on the specified site in compliance with the conditions of the contract or order, the supplier bearing all risks and charges involved until the goods are so delivered and a valid receipt is obtained.

1.11 "Dumping" occurs when a private enterprise abroad market its goods on own initiative in the RSA at lower prices than that of the country of origin and which have the potential to harm the local industries in the RSA.

1.12 "Force majeure" means an event beyond the control of the supplier and not involving the supplier's fault or negligence and not foreseeable. Such events may include, but is not restricted to, acts of the purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.

1.13 "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of any bidder, and includes collusive practice among bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the bidder of the benefits of free and open competition.

1.14 "GCC" means the General Conditions of Contract.

1.15 "Goods" means all of the equipment, machinery, and/or other materials that the supplier is required to supply to the purchaser under the contract.

1.16 "Imported content" means that portion of the bidding price represented by the cost of components, parts or materials which have been or are still to be imported (whether by the supplier or his subcontractors) and which costs are inclusive of the costs abroad, plus freight and other direct importation costs such as landing costs, dock dues, import duty, sales duty or other similar tax or duty at the South African place of entry as well as transportation and handling charges to the factory in the Republic where the goods covered by the bid will be manufactured.

1.17 "Local content" means that portion of the bidding price, which is not included in the imported content provided that local manufacture does take place.

1.18 "Manufacture" means the production of products in a factory using labour, materials, components and machinery and includes other related value-adding activities.

1.19 "Order" means an official written order issued for the supply of goods or works or the rendering of a service.

1.20 "Project site," where applicable, means the place indicated in bidding documents.

1.21 "Purchaser" means the organization purchasing the goods.

1.22 "Republic" means the Republic of South Africa.

1.23 "SCC" means the Special Conditions of Contract.

1.24 "Services" means those functional services ancillary to the supply of the goods, such as transportation and any other incidental services, such as installation, commissioning, provision of technical assistance, training, catering, gardening, security, maintenance and other such obligations of the supplier covered under the contract.

1.25 "Supplier" means the successful bidder who is awarded the contract to maintain and administer the required and specified service(s) to the State.

1.26 "Tort" means in breach of contract.

1.27 "Turnkey" means a procurement process where one service provider assumes total responsibility for all aspects of the project and delivers the full end product / service required by the contract.

1.28 "Written" or "in writing" means hand-written in ink or any form of electronic or mechanical writing.

2. Application

2.1 These general conditions are applicable to all bids, contracts and orders including bids for functional and professional services (excluding professional services related to the building and construction industry), sales, hiring, letting and the granting or acquiring of rights, but excluding immovable property, unless otherwise indicated in the bidding documents.

2.2 Where applicable, special conditions of contract are also laid down to cover specific goods, services or works.

2.3 Where such special conditions of contract are in conflict with these general conditions, the special conditions shall apply.

3. General

3.1 Unless otherwise indicated in the bidding documents, the purchaser shall not be liable for any expense incurred in the preparation and submission of a bid. Where applicable a non-refundable fee for documents may be charged.

3.2 Invitations to bid are usually published in locally distributed news media and on the municipality/municipal entity website.

4. Standards

4.1 The goods supplied shall conform to the standards mentioned in the bidding documents and specifications.

5. Use of contract documents and information inspection

5.1 The supplier shall not, without the purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of the purchaser in connection therewith, to any person other than a person employed by the supplier in the performance of the contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.

5.2 The supplier shall not, without the purchaser's prior written consent, make use of any document or information mentioned in GCC clause 5.1 except for purposes of performing the contract.

5.3 Any document, other than the contract itself mentioned in GCC clause 5.1 shall remain the property of the purchaser and shall be returned (all copies) to the purchaser on completion of the supplier's performance under the contract if so required by the purchaser.

5.4 The supplier shall permit the purchaser to inspect the supplier's records relating to the performance of the supplier and to have them audited by auditors appointed by the purchaser, if so required by the purchaser.

6. Patent Rights

6.1 The supplier shall indemnify the purchaser against all third-party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods or any part thereof by the purchaser.

6.2 When a supplier developed documentation / projects for the municipality / municipal entity, the intellectual, copy and patent rights or ownership of such documents or projects will vest in the municipality / municipal entity.

7. Performance security

7.1 Within thirty (30) days of receipt of the notification of contract award, the successful bidder shall furnish to the purchaser the performance security of the amount specified in SCC.

7.2 The proceeds of the performance security shall be payable to the purchaser as compensation for any loss resulting from the supplier's failure to complete his obligations under the contract.

7.3 The performance security shall be denominated in the currency of the contract or in a freely convertible currency acceptable to the purchaser and shall be in one of the following forms:

(a) a bank guarantee or an irrevocable letter of credit issued by a reputable bank located in the purchaser's country or abroad, acceptable to the purchaser, in the form provided in the bidding documents or another form acceptable to the purchaser; or

(b) a cashier's or certified cheque.

7.4 The performance security will be discharged by the purchaser 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 otherwise specified.

8. Inspections, tests and analyses

8.1 All pre-bidding testing will be for the account of the bidder.

8.2 If it is a bid condition that goods to be produced or services to be rendered should at any stage be subject to inspections, tests and analyses, the bidder or contractor's premises shall be open, at all reasonable hours, for inspection by a representative of the purchaser or organization acting on behalf of the purchaser.

8.3 If there are no inspection requirements indicated in the bidding documents and no mention is made in the contract, but during the contract period it is decided that inspections shall be carried out, the purchaser shall itself make the necessary arrangements, including payment arrangements with the testing authority concerned.

8.4 If the inspections, tests and analyses referred to in clauses 8.2 and 8.3 show the goods to be in accordance with the contract requirements, the cost of the inspections, tests and analyses shall be defrayed by the purchaser.

8.5 Where the goods or services referred to in clauses 8.2 and 8.3 do not comply with the contract requirements, irrespective of whether such goods or services are accepted or not, the cost in connection with these inspections, tests or analyses shall be defrayed by the supplier.

8.6 Goods and services which are referred to in clauses 8.2 and 8.3 and which do not comply with the contract requirements may be rejected.

8.7 Any contract goods may on or after delivery be inspected, tested or analysed and may be rejected if found not to comply with the requirements of the contract. Such rejected goods shall be held at the cost and risk of the supplier who shall, when called upon, remove them immediately at his own cost and forthwith substitute them with goods, which do comply with the requirements of the contract. Failing such removal the rejected goods shall be returned at the suppliers cost and risk. Should the supplier fail to provide the substitute goods forthwith, the purchaser may, without giving the supplier further opportunity to substitute the rejected goods, purchase such goods as may be necessary at the expense of the supplier.

8.8 The provisions of clauses 8.4 to 8.7 shall not prejudice the right of the purchaser to cancel the contract on account of a breach of the conditions thereof, or to act in terms of Clause 22 of GCC.

9. Packing

9.1 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. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to extreme temperatures, salt and precipitation during transit, and open storage. Packing, case size 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.

9.2 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, and in any subsequent instructions ordered by the purchaser.

10. Delivery and documents

10.1 Delivery of the goods and arrangements for shipping and clearance obligations, shall be made by the supplier in accordance with the terms specified in the contract.

11. Insurance

11.1 The goods supplied under the contract shall be fully insured in a freely convertible currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified.

12. Transportation

12.1 Should a price other than an all-inclusive delivered price be required, this shall be specified.

13. Incidental Services

13.1 The supplier may be required to provide any or all of the following services, including additional services, if any:

(a) performance or supervision of on-site assembly and/or commissioning 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 purchaser's personnel, at the supplier's plant and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied goods.

13.2 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.

14. Spare parts

14.1 As specified, the supplier may be required to provide any or all of the following materials, notifications, and information pertaining to spare parts manufactured or distributed by the supplier:

(a) such spare parts as the purchaser may elect to purchase from the supplier, provided that this election shall not relieve the supplier of any warranty obligations under the contract; and;

(b) in the event of termination of production of the spare parts:

(I) advance notification to the purchaser of the pending termination, in sufficient time to permit the purchaser to procure needed requirements; and

(ii) following such termination, furnishing at no cost to the purchaser, the blueprints, drawings, and specifications of the spare parts, if requested.

15. Warranty

15.1 The supplier warrants that the goods supplied under the contract are new, unused, of the most recent or current models, and that they incorporate all recent improvements in design and materials unless provided otherwise in the contract. The supplier further warrants that all goods supplied under this contract shall have no defect, arising from design, materials, or workmanship (except when the design and/or material is required by the purchaser's specifications) 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 of final destination.

15.2 This 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 contract, or for eighteen (18) months after the date of shipment from the port or place of loading in the source country, whichever period concludes earlier, unless specified otherwise.

15.3 The purchaser shall promptly notify the supplier in writing of any claims arising under this warranty.

15.4 Upon receipt of such notice, the supplier shall, within the period specified and with all reasonable speed, repair or replace the defective goods or parts thereof, without costs to the purchaser.

15.5 If the supplier, having been notified, fails to remedy the defect(s) within the period specified, the purchaser may proceed to take such remedial action as may be necessary, at the supplier's risk and expense and without prejudice to any other rights which the purchaser may have against the supplier under the contract.

16. Payment

16.1 The method and conditions of payment to be made to the supplier under this contract shall be specified.

16.2 The supplier shall furnish the purchaser with an invoice accompanied by a copy of the delivery note and upon fulfilment of other obligations stipulated in the contract.

16.3 Payments shall be made promptly by the purchaser, but in no case later than thirty (30) days after submission of an invoice or claim by the supplier.

16.4 Payment will be made in Rand unless otherwise stipulated.

17. Prices

17.1 Prices charged by the supplier for goods delivered and services performed under the contract shall not vary from the prices quoted by the supplier in his bid, with the exception of any price adjustments authorized or in the purchaser's request for bid validity extension, as the case may be.

18. Variation orders

18.1 In cases where the estimated value of the envisaged changes in purchase does not vary more than 15% of the total value of the original contract, the contractor may be instructed to deliver the goods or render the services as such. In cases of measurable quantities, the contractor may be approached to reduce the unit price, and such offers may be accepted provided that there is no escalation in price.

19. Assignment

19.1 The supplier shall not assign, in whole or in part, its obligations to perform under the contract, except with the purchaser's prior written consent.

20. Subcontracts

20.1 The supplier shall notify the purchaser in writing of all subcontracts awarded under this contracts if not already specified in the bid. Such notification, in the original bid or later, shall not relieve the supplier from any liability or obligation under the contract.

21. Delays in the supplier's performance

21.1 Delivery of the goods and performance of services shall be made by the supplier in accordance with the time schedule prescribed by the purchaser in the contract.

21.2 If at any time during performance of the contract, the supplier or its subcontractor(s) should encounter conditions impeding timely delivery of the goods and performance of services, the supplier shall promptly notify the purchaser in writing of the fact of the delay, its likely duration and its cause(s). As soon as practicable after receipt of the supplier's notice, the purchaser shall evaluate the situation and may at his discretion extend the supplier's time for performance, with or without the imposition of penalties, in which case the extension shall be ratified by the parties by amendment of contract.

21.3 The right is reserved to procure outside of the contract small quantities or to have minor essential services executed if an emergency arises, the supplier's point of supply is not situated at or near the place where the goods are required, or the supplier's services are not readily available.

21.4 Except as provided under GCC Clause 25, a delay by the supplier in the performance of its delivery obligations shall render the supplier liable to the imposition of penalties, pursuant to GCC Clause 22, unless an extension of time is agreed upon pursuant to GCC Clause 22.2 without the application of penalties.

21.5 Upon any delay beyond the delivery period in the case of a goods contract, the purchaser shall, without cancelling the contract, be entitled to purchase goods of a similar quality and up to the same quantity in substitution of the goods not supplied in conformity with the contract and to return any goods delivered later at the supplier's expense and risk, or to cancel the contract and buy such goods as may be required to complete the contract and without prejudice to his other rights, be entitled to claim damages from the supplier.

22. Penalties

22.1 Subject to GCC Clause 25, if the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price, as a penalty, a sum calculated on the delivered price of the delayed goods or unperformed services using the current prime interest rate calculated for each day of the delay until actual delivery or performance. The purchaser may also consider termination of the contract pursuant to GCC Clause 23.

23. Termination for default

23.1 The purchaser, without prejudice to any other remedy for breach of contract, by written notice of default sent to the supplier, may terminate this contract in whole or in part:

(a) if the supplier fails to deliver any or all of the goods within the period(s) specified in the contract, or within any extension thereof granted by the purchaser pursuant to GCC Clause 21.2;

(b) if the supplier fails to perform any other obligation(s) under the contract; or

(c) if the supplier, in the judgement of the purchaser, has engaged in corrupt or fraudulent practices in competing for or in executing the contract.

23.2 In the event the purchaser terminates the contract in whole or in part, the purchaser may procure, upon such terms and in such manner, as it deems appropriate, goods, works or services similar to those undelivered, and the supplier shall be liable to the purchaser for any excess costs for such similar goods, works or services. However, the supplier shall continue performance of the contract to the extent not terminated.

23.3 Where the purchaser terminates the contract in whole or in part, the purchaser may decide to impose a restriction penalty on the supplier by prohibiting such supplier from doing business with the public sector for a period not exceeding 10 years.

23.4 If a purchaser intends imposing a restriction on a supplier or any person associated with the supplier, the supplier will be allowed a time period of not more than fourteen (14) days to provide reasons why the envisaged restriction should not be imposed. Should the supplier fail to respond within the stipulated fourteen (14) days the purchaser may regard the supplier as having no objection and proceed with the restriction.

23.5 Any restriction imposed on any person by the purchaser will, at the discretion of the purchaser, also be applicable to any other enterprise or any partner, manager, director or other person who wholly or partly exercises or exercised or may exercise control over the enterprise of the first-mentioned person, and with which enterprise or person the first-mentioned person, is or was in the opinion of the purchaser actively associated.

23.6 If a restriction is imposed, the purchaser must, within five (5) working days of such imposition, furnish the National Treasury, with the following information:

(i) the name and address of the supplier and / or person restricted by the purchaser;

(ii) the date of commencement of the restriction

(iii) the period of restriction; and

(iv) the reasons for the restriction.

These details will be loaded in the National Treasury's central database of suppliers or persons prohibited from doing business with the public sector.

23.7 If a court of law convicts a person of an offence as contemplated in sections 12 or 13 of the Prevention and Combating of Corrupt Activities Act, No. 12 of 2004, the court may also rule that such person's name be endorsed on the Register for Tender Defaulters. When a person's name has been endorsed on the Register, the person will be prohibited from doing business with the public sector for a period not less than five years and not more than 10 years. The National Treasury is empowered to determine the period of restriction and each case will be dealt with on its own merits. According to section 32 of the Act the Register must be open to the public. The Register can be perused on the National Treasury website.

24. Antidumping and countervailing duties and rights

24.1 When, after the date of bid, provisional payments are required, or anti-dumping or countervailing duties are imposed, or the amount of a provisional payment or anti-dumping or countervailing right is increased in respect of any dumped or subsidized import, the State is not liable for any amount so required or imposed, or for the amount of any such increase. When, after the said date, such a provisional payment is no longer required or any such anti-dumping or countervailing right is abolished, or where the amount of such provisional payment or any such right is reduced, any such favourable difference shall on demand be paid forthwith by the supplier to the purchaser or the purchaser may deduct such amounts from moneys (if any) which may otherwise be due to the supplier in regard to goods or services which he delivered or rendered, or is to deliver or render in terms of the contract or any other contract or any other amount which may be due to him.

25. Force Majeure

25.1 Notwithstanding the provisions of GCC Clauses 22 and 23, the supplier shall not be liable for forfeiture of its performance security, damages, or termination for default if and to the extent that his delay in performance or other failure to perform his obligations under the contract is the result of an event of force majeure.

25.2 If a force majeure situation arises, the supplier shall promptly notify the purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the purchaser 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.

26. Termination for insolvency

26.1 The purchaser may at any time terminate the contract by giving written notice to the supplier if the supplier becomes bankrupt or otherwise insolvent. In this event, termination will be without compensation to the supplier, provided that such termination will not prejudice or affect any right of action or remedy, which has accrued or will accrue thereafter to the purchaser.

27. Settlement of Disputes

27.1 If any dispute or difference of any kind whatsoever arises between the purchaser and the supplier in connection with or arising out of the contract, the parties shall make every effort to resolve amicably such dispute or difference by mutual consultation.

27.2 If, after thirty (30) days, the parties have failed to resolve their dispute or difference by such mutual consultation, then either the purchaser or the supplier may give notice to the other party of his intention to commence with mediation. No mediation in respect of this matter may be commenced unless such notice is given to the other party.

27.3 Should it not be possible to settle a dispute by means of mediation, it may be settled in a South African court of law.

27.4 Notwithstanding any reference to mediation and/or court proceedings herein,

(a) the parties shall continue to perform their respective obligations under the contract unless they otherwise agree; and

(b) the purchaser shall pay the supplier any monies due the supplier for goods delivered and / or services rendered according to the prescripts of the contract.

28. Limitation of Liability

28.1 Except in cases of criminal negligence or wilful misconduct, and in the case of infringement pursuant to Clause 6;

(a) the supplier shall not be liable to the purchaser, 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 penalties and/or damages to the purchaser; and

(b) the aggregate liability of the supplier to the purchaser, 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.

29. Governing language

29.1 The contract shall be written in English. All correspondence and other documents pertaining to the contract that is exchanged by the parties shall also be written in English.

30. Applicable law

30.1 The contract shall be interpreted in accordance with South African laws, unless otherwise specified.

31. Notices

31.1 Every written acceptance of a bid shall be posted to the supplier concerned by registered or certified mail and any other notice to him shall be posted by ordinary mail to the address furnished in his bid or to the address notified later by him in writing and such posting shall be deemed to be proper service of such notice.

31.2 The time mentioned in the contract documents for performing any act after such aforesaid notice has been given, shall be reckoned from the date of posting of such notice.

32. Taxes and duties

32.1 A foreign supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

32.2 A local supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted goods to the purchaser.

32.3 No contract shall be concluded with any bidder whose tax matters are not in order. Prior to the award of a bid SARS must have certified that the tax matters of the preferred bidder are in order.

32.4 No contract shall be concluded with any bidder whose municipal rates and taxes and municipal services charges are in arrears.

33. Transfer of Contracts

33.1 The contractor shall not abandon, transfer, cede assign or sublet a contract or part thereof without the written permission of the purchaser.

34. Amendment of contracts

34.1 No agreement to amend or vary a contract or order or the conditions, stipulations or provisions thereof shall be valid and of any force unless such agreement to amend or vary is entered into in writing and signed by the contracting parties. Any waiver of the requirement that the agreement to amend or vary shall be in writing, shall also be in writing.

35. Prohibition of restrictive practices

35.1 In terms of section 4 (1) (b) (iii) of the Competition Act No. 89 of 1998, as amended, an agreement between, or concerted practice by, firms, or a decision by an association of firms, is prohibited if it is between parties in a horizontal relationship and if a bidder(s) is / are or a contractor(s) was / were involved in collusive bidding.

35.2 If a bidder(s) or contractor(s) based on reasonable grounds or evidence obtained by the purchaser has / have engaged in the restrictive practice referred to above, the purchaser may refer the matter to the Competition Commission for investigation and possible imposition of administrative penalties as contemplated in section 59 of the Competition Act No 89 0f 1998.

35.3 If a bidder(s) or contractor(s) has / have been found guilty by the Competition Commission of the restrictive practice referred to above, the purchaser may, in addition and without prejudice to any other remedy provided for, invalidate the bid(s) for such item(s) offered, and / or terminate the contract in whole or part, and / or restrict the bidder(s) or contractor(s) from conducting business with the public sector for a period not exceeding ten (10) years and / or claim damages from the bidder(s) or contractor(s) concerned.

SECTION 6: SPECIAL / ADDITIONAL CONDITIONS OF CONTRACT

The ***Conditions of Contract*** make reference to the ***Special Conditions of Contract (SSC)*** for details that apply specifically to this bid. The ***Special Conditions of Contract*** shall have precedence in the interpretation of any ambiguity or inconsistency between it and the ***Conditions of Contract***.

Each item below is cross-referenced to the clause in the ***Conditions of Contract*** to which it mainly applies.

SCC 1.2 **CONTRACT**

This contract will commence upon receipt of the letter of appointment and shall terminate at the end of the 24 month period .

SCC 7.1 **PERFORMANCE SECURITY**

The liability and time for submission of the Performance Security will be as follows:

(a) For contracts of value less than R 1,000,000 (incl) the liability of the Performance Security shall be Nil.

(b) For contracts of value greater than R 1,000,000 and less than R 10,000,000 (incl) the liability of the Performance Security shall be 5% of the total tender value.

(c) For contracts of value greater than R 10,000,000 (incl) the liability of the Performance Security shall be 10% of the total tender value.

The Contractor will be required to furnish the Performance Security (Surety Bond), from a bank or approved insurance company within fourteen (14) days of notification of award.

SCC 7.4 **PERFORMANCE SECURITY**

Detail any alternative requirements OR delete if not applicable.

SCC 10.1 **DELIVERY AND DOCUMENTS**

Delivery of goods shall be borne by the bidder and shall be delivered to eThekwini Municipality: Energy Management Directorate, 1 Jelf Taylor Crescent, Durban, 4001. Control Building.

SCC 11.1 **INSURANCE**

Detail any alternative requirements OR delete if not applicable.

SCC 15.2 **WARRANTY**

Hardware to be supplied as per the technical specification clause 4: Hardware shall have a lifespan of 5 years from the date of commissioning.

SCC 16.1 **PAYMENT**

The Contractor shall submit to the Department concerned a detailed account which shall reflect the identifying number of each item / service. Payment will be made on this account when checked and substantiated by the authorised official.

Payment for goods received and accepted by the Municipality shall be made no later than 30 days after submission of invoice or claim, provided however that all the terms of the contract are duly complied with.

Payment will be made only to the supplier. Factoring arrangements will not be accepted.

SCC 17 **PRICES**

Prices are fixed for the duration of the contract.

SCC 22.1 **PENALTIES**

Replace this clause with the following:

"If the supplier fails to deliver any or all of the goods or to perform the services within the period(s) specified in the contract, the purchaser shall, without prejudice to its other remedies under the contract, deduct from the contract price (as a penalty):

- A penalty of 5% of the order value for each day the project is delayed or milestone not met.

The purchaser may also consider termination of the contract pursuant to GCC Clause 23."

ADDITIONAL CONDITIONS OF CONTRACT

ACC1 PERFORMANCE MONITORING & ASSESSMENT OF SERVICE PROVIDERS

For contract awards that are greater than R10m, the Contractor shall be subjected to "Performance Monitoring" assessments in terms of the applicable Section of the Council's current Supply Chain Management Policy.

ACC2 QUALITY OF PRODUCTS

No inferior products will be accepted under this enquiry.

Should there be any cause for complaint against the standard of service or quality of products offered which is not resolved within a period of 10 working days, the Municipality reserves the right to cancel the contract after serving one month's notice, in writing, to the supplier involved. Should such notice be given, the supplier shall nevertheless be obliged to perform the duties covered by the contract up to the date of expiration of the period of notice.

ACC3 SATISFACTORY PERFORMANCE

The supplier shall employ for the purpose of this contract only such personnel as are careful and competent and the Municipality shall be at liberty to object to and require the supplier to remove from the job forthwith any person, including supervisory staff, employed by the supplier who, in the opinion of the Municipality, misconducts himself/herself or is incompetent or negligent in the proper performance of his/her duties and such person shall not again be employed upon this contract without the permission of the Municipality.

ACC4 OCCUPATIONAL INJURIES AND DISEASES ACT

This act replaces the Workmen's Compensation Act:

The supplier **shall, before commencement of work, produce documentary proof to the Deputy Municipal Manager, Treasury: Finance that he has complied in all respects with the provisions of the Occupational Injuries and Diseases Act**. The supplier undertakes that he/she will perform and comply with all provisions of the Occupational Injuries and Diseases Act and more particularly that he/she will render all returns and pay all assessments for which he/she is liable in terms of such Act.

ACC5 DAMAGE TO PERSONS AND PROPERTY

(1) The supplier **shall** indemnify and keep indemnified the Council against any claim for death, injury, damage or loss to any person or property whatsoever in respect thereof or in relation thereto.

(2) The supplier enters into this contract as an independent contractor and shall be solely liable in respect of any claim for death, injury, damage or loss to any person or property whatsoever in respect thereof or in relation thereto.

ACC6 RATE OF EXCHANGE VARIATION

Where the goods are imported the Contractor shall within seven days of date of Official Purchase Order, arrange through his bankers for the foreign commitment to be covered forward down to the Rand in order to fix the rate of exchange. The Contractor shall notify the Municipality as soon as possible thereafter regarding the rate which has been fixed on such forward exchange. The

forward cover shall be from a reputable South African bank. The Contractor is to confirm with the employer prior to placing forward cover if the service provider is acceptable.

Any increase or decrease between the basic rate of exchange as at 12:00 on the date of close of the bid and that existing at the date of establishment of the forward exchange cover within the period stipulated above shall be paid or deducted by the Municipality. Upon the failure of the Contractor to arrange forward exchange cover, the Contractor shall be liable should there be an increase in the basic rate of exchange occurring after the last-mentioned date.

The bank charges incurred in obtaining the forward exchange cover must be included in the Tenderer's bid.

ACC7 **ESTIMATED QUANITITIES**

The quantities stated in Section 8 are applicable for evaluation purposes only. The final quantity of goods and services required shall vary, depending on the total number of actual instances a service/goods will be required over the Contract Period. The rates tendered shall be applicable, irrespective of the total quantity of goods and services procured over the contract duration.

ACC8 **SERVICE PROVIDER OFFICE REQUIREMENTS**

The service provider must have, for the duration of the contract, a local presence (within the geographical eThekwini boundary).

SECTION 7: SCOPE AND SPECIFICATION OF REQUIRED SUPPLY / SERVICES

1. Grid Operation High Level Overview

1.1 This technical specification is for a Grid Operation solution which is centered on an Outage Management System (OMS) integrated with Supervisory Control and Data Acquisition (SCADA) functionalities. It outlines a modular, open-architecture system designed for utility-scale grid management, supporting real-time monitoring, control, outage handling, and work management across high-voltage (HV), medium-voltage (MV), low-voltage (LV) networks.

Table 1 eThekwini Transmission and Distribution Asset

Asset	Count
High Voltage substation	190
Medium Voltage substations	890
Auto Reclosers	1500
MV Mini substations	6037
Streetlights	270 556
Consumer Meters	900 000

1.2 Key emphasis include:

a) Open and Standard-Based Architecture: Compliance to IEC 619/61968 (Common information Model: CIM);
b) Microsoft-centric Platform;
c) Scalability and Reliability;
d) Production Environments and a Simulator Training;
e) Hardware, Network devices and end-user workstations;
f) Data Models: Describes a unified, CIM-adapted model stored in as single database.

1.2 Overall, the specification calls for a robust, enterprise-grade OMS/SCADA hybrid for Energy Management Directorate, focusing on operational efficiency, security, and futureproofing. It aligns with industry trends towards integrated ADMS (Advanced Distribution Management Systems) but is prescriptive on Microsoft ecosystem.

1.3 **Table 1: Standard specifications and normative references**

Standard specification/ normative reference	Description
IEC 61968 (CIM):	Application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations.
IEC 61970 (CIM):	Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base.
IEC 61850:	Communication networks and systems for power utility automation.
IEC 60870-5-104:	Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles.
IEC 62351:	Power systems management and associated information exchange – Data and communications security.
IEEE 1547-2018:	IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces.
NRS 048	Electricity Supply — Quality of Supply
NRS 047	Electricity Supply — Quality of Service and Reporting Guidelines
NRS 097-2	Grid Interconnection of Embedded Generation – Part 2: Small-Scale Embedded Generation (SSEG)
IEEE 1366:	IEEE Guide for Electric Power Distribution Reliability Indices
NIST SP 800 series	NIST cybersecurity framework
IEC 62443	Security for industrial automation and control systems

1.4 **Key minimum requirements**

To ensure that the Directorate gets the best system on the market, the following will serve as a base for the system technical evaluation:

1.4.1. Predictive Outage Analytics

a) The System must provide predictive outage detection using AMI (smart meter) data, IoT Sensors, and weather inputs.

b) It must anticipate faults before escalation and recommend preventive actions, not only reactive restoration.

1.4.2. Integrated Distributed Energy Resources Management

a) The System must natively manage distributed energy resources including solar PV, Wind, Batteries and Microgrids;

b) Distributed Energy Resources must be embedded in the core platform, not delivered as a separate module.

1.4.3. Unified Network Model

a) The System must operate OMS, DMS and SCADA functions on a single, consistent network model;

b) The synchronization between separate models will not be accepted. All outage detection, switching and restoration must run on one integrated grid representation.

1.4.4. Volt/VAR Optimization and CVR

a) The system must include real-time volt/VAR optimization and conservation voltage reduction functions

b) This must be integrated with outage management and distribution operations to reduce losses and improve efficiency.

1.4.5. Sustainability and Advanced Analytic

a) Specify Distribution Energy Resource (DER)/EV integration, emissions tracking, and Machine

Learning for predictive maintenance.

1.4.6. Continuous Innovation backbone

a) The Service provider must demonstrate a dedicated global R&D hub focused solely on ADMS innovation, with track records of continuous feature development and operational support;

b) Distributed or general-purpose IT development teams shall be insufficient.

1.4.7. Native Consumer Engagement

a) The OMS component must provide **customer-facing tools** for outage notifications, estimated restoration times and reporting;

b) Integration with third-party CRM systems maybe optional, but the solution (system) must deliver these functions natively.

1.4.8. Advanced Switching and Restoration Automation

a) The System must support automated switching and restoration across the full grid model;

b) Fault Location and Isolation, and Restoration must be integrated with OMS and SCADA, not limited to isolated modules.

1.4.9. Training and Simulation Mode.

a) The system must include built-in simulator that uses the live network model for operator training and scenario testing;

b) External of offline training tools shall not be sufficient.

2. Scope of Supply / Services

2.1 Energy Management Directorate is seeking services from service providers to supply and implement Outage Management System (OMS) to address the current challenges in its distribution network operations. Energy Management Directorate, a forward thinking organization, recognizes the importance of adopting a strategic and data-driven approach to achieve sustainable performance and long-lasting results, is embarked on the sourcing and implementation of the OMS having in its roadmap the completion of a Grid Operation Software to proactively tackle challenges and remain at the cutting edge of technological advancements in the distribution sector.

It is the intension of Energy Management Directorate to award the contract to the single successfully selected Vendor for end-to-end responsibility for the design, procurement, commissioning, and deployment of full feature Outage Management System (OMS) capable of extending and fulfilling current and future needs of Energy Management Directorate and that will serve different Departments within the Directorate.

2.2 The key strategic objectives expected from the implementation of this system include:

a) Reduce complexity for the System Operator by reducing core applications from separate applications to integrated applications;
b) Improve ability of System Operator to monitor and control field devices transition from traditional corrective to proactive approach;
c) Operate and Manage the Distribution system more efficiently, accurately, and safely;
d) Ability to integrate with existing systems (Oracle CX, Ellipse, GIS etc.) and other systems that may be implemented in the future;
e) Significant reduction in fault identification and restoration time;
f) Improvement in Reliability – Reduction in annual SAIDI/SAIFI index.

2.3 The System shall support the following major functionalities:

a) Outage Management System with integrated crew mobility solution;
b) Integrations with the existing IT and OT systems currently running/ under implementation in Energy Management Directorate necessary for fulfilling the scope of OMS;
c) Capability of interoperability with other systems;
d) Information Storage and Retrieval (IS&R) Systems;
e) System interfaces with the Corporate Network, Web User Interface Server;
f) Training Simulator;
g) Redundant systems at both Primary and Disaster Recovery Distribution Control Centre.

2.4 Outage Management System (OMS), described within this document, shall provide tools for dynamic visualization, monitoring, and outage management of distribution electrical network, together with a technical database and layered architecture. OMS software shall be based on the SOA (Software Open Architecture) principles and Microsoft platform. It shall enable very simple integration with other standard software and hardware equipment applied in the environment of electrical distribution (GIS, MDM/AMI, equipment automation).

3. SOFTWARE ARCHITECTURE

3.1 The OMS Software architecture shall follow open architecture standards, applied in the most industry automation real-time IT systems, as well as in business corporate IT solutions. The Grid Operation functionalities shall be composed of a series of software components that interact together and work on a common platform and data model, while sharing the same GUI.

3.2 The main features of the system from the functional and architectural standpoint shall include:

a) a data model able to cover all voltage levels (HV, MV, LV) and network types;
b) high performance application systems and integration;
c) Robust cyber security;
d) versioning system for network scheme and graphical (display) data;
e) multi-site solution;
f) standard interfaces based on IEC 61970/IEC 61968;
g) client and web client solutions.

3.3 The system shall be fully developed by single successful service provider, as a modular solution, with native, two-way integration between modules that are running on a single (common) platform and API documentation standard for external extensions.

3.4 The Production environment is the most important part of a solution which is used for operations, and it shall contain the following Systems:

a) **Real-time System (Core)**: used by operators for management of real-time monitoring and control of the network. Real-time System shall include SCADA functionality with multiple instances of front-end processors to communicate with field devices using standard protocols, like: DNP3, IEC 60870-5-10, or with other SCADA systems using ICCP. The system shall contain network data model with actual state of the power grid. Activities in this system shall include data model import from external data sources and extensive model validations, as well as manual maintenance of network displays. It shall contain role-based access control (RBAC), audit logging and for telemetry;
b) **Access Services System:** Web servers in this system shall provide access to this system from web clients via remote authentication methods. Other user activities shall be deployed via a non-production environment. The non-production environment shall be used for testing configuration instances and data migration before it is deployed to the operational environment.
c) **Test** or **Quality Assurance**: The testing environment shall include:
configuration testing; performance testing; testing operating system, hot-fixes, system updates, ~~etc~~. The solution shall be capable of performing updates with zero downtime. The service provider shall be able to provide automated testing that supports the acceleration of testing after installing new patches.

3.5 Software Components

3.5.1. Software Requirements

System architecture shall consist of the following layered components:

a) GUI clients at the presentation layer,
b) Application Services at the application layer,
c) Historical Services at the database layer.

3.5.2 Application Services

3.5.2.1 Real time Service

The RealTime Service shall provide real-time data processing and cover a majority of application functionalities. It shall consist of many services that can be grouped into the following functional groups:

1. SCADA Front-End Processor;
2. Grid Operation Platform Services;
3. Outage Management;
4. Work Management; and
5. Supporting Services (analytics).

3.5.2.2 Front-End Processor

3.5.2.2.1 Front end processors shall provide SCADA functionality which covers all aspects of data collection and monitoring, including field device polling, supervisory controls, and alarm processing.

3.5.2.2.2 Measurements and device states shall be received by Front End Processor (FEP) components, internally processed (for alarm conditions), and then forwarded to other services.

3.5.2.2.3 The collected real-time values shall be presented on GUI applications and stored in the database.

3.5.2.2.4 The FEP shall support distributed architecture to accommodate disruptions during commissioning and maintenance.

3.5.2.2.5 The FEP communication protocol shall conform to DNP3 level 3 over TC/IP/WAN.

3.5.2.2.6 The FEP shall acts the DNP Master to synchronise field device clocks, ensuring Sequence of Events accuracy.

3.5.2.2.7 The FEP shall supports both solicited and unsolicited data reporting modes.

3.5.2.2.8 The FEP shall support integrity polling of field devices at configurable polling intervals for each station.

3.5.2.2.9 The FEP's scan rate and polling rate shall be configurable for each station.

3.5.2.2.10 The FEP shall support the following control mechanism: Direct Operate, Select before operate etc.

3.5.2.2.11 The FEP shall support single and double point binary input/output.

3.5.2.2.12 The FEP shall support Analog input/output with floating point and various scaling factors.

3.5.2.2.13 The FEP shall support DNP3 file transfer objects to allow remote retrieval of disturbance records.

3.5.2.3 Grid Operation Platform Services

3.5.2.3.1 Grid Operation Platform Services host in-memory databases shall contain data needed by other services and client workstation applications.

3.5.2.3.2 The acceptable in-memory database technologies shall include high-performance, clustered in-memory solutions and data consistency mechanisms.

3.5.2.4 Historical Services

3.5.2.4.1 Historical services shall be based on Microsoft's SQL Server with modules responsible for the collection and long-term storage of all auditable actions and events.

3.5.2.4.2 The power grid data model shall include all changes which are stored in increments described by changesets and other data repositories.

3.5.2.4.3 All application server components shall utilize the Microsoft Windows Server operating system, inclusive of Microsoft Windows Server latest version and Microsoft SQL Server latest version

3.5.3 System Architecture

3.5.3.1 Architecture principles

3.5.3.1.1 The grid operation solution shall be deployed at the primary and redundant data centres. Critical services shall be deployed in redundant configuration which includes redundant hardware (servers, storages, network connections and devices) and high-availability (HA) clusters for services.

3.5.3.1.2 In the event of a failover, the transition between the two data centres shall be possible with switchover functionality. The data shall be replicated between the two systems in near real-time.

3.5.3.1.3 HA shall be achieved by utilizing a 'no single point of failure' architecture philosophy. The failover of any faulty component shall be immediate and seamless to the users.

3.5.3.1.4 The Grid Operation solution shall be virtualized and hosted in virtual machines, which are deployed in physical hosts with enough hardware resources to host all planned VMs. Microsoft Hyper-V or VMWare hypervisors shall be used.

3.5.3.1.5 The Grid Operation client applications shall be deployed on workstations with Microsoft Windows operating system.

3.5.3.1.6 The system shall have a process historian database that stores network events and load reading data which shall include:

a) Time Series Database-dedicated to high-speed trends and historical data.
b) Relational Database for managing tags, metadata

3.5.3.1.7 Grid Operation services shall be vertically and horizontally scalable.

3.5.3.1.8 This architecture shall enable the use of DNS.

3.5.3.1.9 The Disaster recovery time objectives shall be as follows:

a) Recovery Time Objective< 30min and
b) Recovery Point Objective<5min.

3.5.4 Non-production environments

3.5.4.1. Quality Assurance environment

Quality assurance environment shall provide full functional, configuration and performance testing of the entire solution having similar configuration to the production system. Network Simulation Service shall exist to simulate signals coming from field devices.

3.5.4.2 Training environment

3.5.4.2.1 A dedicated enterprise Dispatcher Training environment shall execute on hardware dedicated to that functionality. It shall provide the ability to train System Operators by simulating both the distribution system and the OMS functions.

3.5.4.2.2 The training equipment shall be isolated from the production Core system with a separate network segment that is designed to isolate this equipment and provide an additional level of security.

4. Hardware

4.1. Servers

4.1.1 The Service Provider shall provide a hardware configuration that utilizes industry standard hardware specifications rather than proprietary hardware and shall be power efficient.

4.1.2 All servers shall have redundant teamed network cards. For connection to storages VM hosts and servers shall have appropriate adapters and “boot from SAN” option shall be supported.

4.1.3 The system shall have a GPS clock to serve as the time source for all networked devices.

4.1.4 The system shall have two real-time database servers operated on a hot standby mode with less than 1s failover.

4.1.5 The system shall have two production servers, where the control operator connects their workstations for monitoring and control of the network.

4.1.6 The system shall have a webserver to host the web-based portal that give access to the process historian.

4.1.7 The system shall have replication servers stationed at the Disaster Recovery Centre.

4.2. Backup Storage

4.2.1 The solution shall have several SAN (Storage Area Network) devices. If needed, each security zone shall use a different SAN device, or a single SAN device shall be shared among few environments.

4.2.2 Dual storage controller with SSDs for VM images, SSDs or 7k2 disks for SQL databases, and 7k2 disks for data backup files shall be used.

4.2.3 Connections between VM hosts/servers and storage controller shall be made through a pair of 16 Gb SAN switches. Backup files shall be located either in SAN devices used by application servers or inside SAN/LTO Backup devices in Management environments.

4.2.4 SAN capacities shall be estimated to include enough storage space for virtual machine images, data stored in Microsoft SQL databases, and “boot from SAN” option.

4.3. Networking

4.3.1 To interconnect all servers, Ethernet switches shall be deployed as stackable pairs, with 48 or 24 ports.

4.3.2 To achieve high availability, connections from servers to corresponding LAN switches shall be redundant, and redundant teamed network cards shall be placed in every VM.

4.3.3 For security of all internal and external communications, firewalls shall be used.

4.4. End-User PC Workstation

4.4.1 End-user PC workstations specification shall include configuration like CPU (Intel Xeon, 4 cores, 3.0+ GHz), RAM (16 GB DDR4), Graphic adapter (e.g. NVIDIA Quadro P600 or P620), 1 TB SATA HDD and Windows 11 operating system or higher/better.

4.5. Availability

4.5.1 The Grid Operation solution shall be designed with “no single point of failure” principle in mind where redundancy mechanisms shall be put in place for the entire hierarchy of software and hardware components.

4.5.2 Availability measures shall be defined for identified critical operator functionality. Overall site availability shall be at least 99.99%. in accordance with IEC 61968 -1 (application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations).

5. Functional Requirements

5.1. MODEL MANAGEMENT

5.1.1. Grid Operation Models

5.1.1.1 Grid Operation shall be based on a unified model, utilizing the principle that all the data are populated in a single database. This simplifies initial database population and later maintenance. Models shall be stored in the database, and their contents shall be available to all system components and modules.

5.1.1.2 The Grid Operation model shall be capable of describing and storing information about all aspects of a Grid Operation system, including its static and dynamic data.

5.1.1.3 “Static” models shall be:

a) **Network Model** - shall contain data about the power grid devices and their attributes and connectivity, with associated telemetry, control and protection resources

b) **Graphics Model** - shall contain representation of Network Model contents in form of network views (displays)

c) **Landbase Model** shall be independent from the Network Model and only provide underlying geographic map features of non-electric nature.

5.1.1.4 “Dynamic” models shall include: Signal Model, Tag Model, Temporary Elements Model, Topology Analysis Results, Smart Meter Management Model, Switching Management Model, Outage Management Models.

5.1.2 Network Model

5.1.2.1 Network Model shall be an object-oriented model of electric power networks based on Common Information Model (CIM) but adapted to specific purposes of the Utility’s OMS and SCADA.

5.1.2.2 The Network Model shall be targeted for applications for steady-state analysis of AC distribution and transmission networks, with an emphasis on distribution and sub-transmission networks.

5.1.2.3 The Grid Operation network model shall include any voltage level (i.e. LV, MV and HV) and it shall be capable of fully modelling substation, primary and secondary network, including customer meters.

5.1.2.4 The Grid Operation Network Model shall be capable of modeling equipment (lines, breakers, disconnectors, fuses, loads, analog and discrete signals, protection relays, line sensors, multistate devices etc.) and equipment containers (regions, substations, bays, feeders, transformers and capacitor banks, etc.).

5.1.2.5 The Grid Operation Network Model shall be updated through the configurable network model maintenance process, with model synchronization as the final step in promoting a change.

5.1.2.6 The Grid Operation Network Model data changes shall be introduced via changesets. A changeset shall be a set of Network Model changes (inserted, updated or deleted elements).

5.1.2.7 The updates shall be executed and tested on the non-production environment.

5.1.2.8 The solution shall support import and export of multiple SCADA entities via files from the network model editor. It shall be possible to add, update or delete SCADA entities via this file.

5.1.2.9 A user shall be able to create a collection of related model objects (template) that can be reused multiple times in the model for insertion of new devices. It shall be possible to create a view related to a template (e.g. faceplate or custom signal layout) and be able to import and export it between systems.

5.1.2.10 Template shall have a list of parameters that can be used for scripting of new instances. Once defined, a parameter shall be possible to use for scripting individual properties of new instances of the template.

5.1.3 Model update workflow

5.1.3.1 Model update is a process in which changes of the network model shall be introduced to the Grid Operation system network model. This process shall not affect any mission-critical process, nor cause data loss or application downtime. Network model management process shall be conducted through the following stages:

a) Changeset creation;

b) Changeset validation Promotion of changeset to the RealTime model.

5.1.3.2 The solution shall be capable of performing network model update without downtime and without blocking/suspending of supervisory commands during the network model update process.

5.1.3.3 During Model updates, roles-based access control shall be incorporated and integrated with an Audit Trail with the following permissions:

a) Read-only;

b) Placed observation/information tags;

c) Operational tags;

d) Safety/inhibit tags; and

e) Configuration.

5.1.4 Creation and Maintenance of Network Model

5.1.4.1 The Network Model shall be imported from ArcGIS/ArcFM using CIM standard.

5.1.4.2 There shall be a two-way communication between Grid Operation and GIS to inform the GIS group if the update was accepted or some changes are needed.

5.1.4.3 The System shall provide native integration with the Directorate existing GIS platform to ensure seamless interoperability, data consistency, and operational efficiency.

5.1.4.4 The system shall integrate directly with Esri ArcGIS Utility Network.

5.1.4.5 The system shall support ArcFM workflows for asset management, network modelling and spatial data validation.

5.1.4.6 The system shall leverage existing ArcFM data structures to reduce duplication of effort and accelerate deployment.

5.1.4.7 Editing and validation processes shall be streamlined, with demonstrable reductions in manual data handling.

5.1.4.8 The system shall utilize ArcFM advanced validation tools to maintain legally defensible assets records.

5.1.4.9 The system shall ensure end to end traceability from GIS asset mapping to ADMS Operational control.

5.1.4.10 The system shall build upon existing ArcFM user workflows, minimizing retraining requirements.

5.1.4.11 The system shall provide continuity of GIS practices within the ADMS environment.

5.1.4.12 The systems shall align with Esri’s Utility Network model to ensure scalability and modernization readiness.

5.1.4.13 The integration shall support migration from legacy ArcFM (ArcMap) to ArcFM XI (ArcGIS Pro)
without disruption.

5.1.5 Temporary Changes

5.1.5.1 The Grid Operation system shall allow for a limited set of temporary changes (adding/removing temporary elements) to the electrical model for the purpose of temporarily altering its connectivity. The following Temporary changes shall be available in the Grid Operation:

a) Cut – Cuts one or more phases of a line;

b) Jumper – Short lines temporarily connecting disconnected nodes of the feeder;

c) Grounding – Connects a particular element to the ground;

d) Switch – Inserted in series with an existing line, allowing subsequent switching operations;

e) Generator – Supplies a de-energized part of the network;

f) Mobile Object – Free user-defined element, typically a transformer or a capacitor;

5.1.5.2 The following actions shall be covered under Temporary Elements functionality:

a) Adding temporary elements in the network;

b) Removing temporary elements from the network;

c) Summary report of all temporary elements that currently exist in the network.

5.1.6 Topology Analysis

5.1.6.1 Topology Analysis (TA) power function is a general tool for various topology analyses of the distribution network represented in the form of graphs. On the basis of network connectivity and switchgear statuses, TA shall provide network topology that is used in other applications, as well as information presented on GUI displays. It shall operate automatically in the background, in all application modes (real time, simulation, study, etc.).

5.1.6.2 The outputs shall be available in every information on the user interface in several forms:

a) Coloring of symbols on all network views;

b) Topology Analysis report;

c) Network Tree (hierarchy of all circuits in the network model); and

d) Dynamic feeder information, available as columns in most reports and summaries.

5.1.6.3 The Property information about network element Main analyses provided by the **TA** shall be:

a) Locating and marking supply paths of network elements – upstream (all sources and flow directions that supply a point);

b) Locating and marking all network elements downstream from the selected element;

c) Determining and marking statuses of network elements (e.g. making distinction among energized and de–energized network elements, switchgear statuses);

d) Locating and marking portions of network being isolated from distribution system and energized by distributed generating resources;

e) Locating and marking network loops;

f) Coloring of network by energization;

g) Coloring of network by voltage level;

h) Coloring of network by Transformer Phase Shift;

i) Coloring of network by Neutral Grounding;

j) Coloring of network by phases (energized status of phases);

k) Coloring of elements in accordance with electrical belonging to a particular network area (feeder, transformer, or substation area);

l) Coloring of network by Energized Island;

m) Coloring according to affiliation to region, sub-region or weather region;

n) Coloring according to rated current of elements;

o) Coloring of LV network and LV feeders;

p) Abnormal Coloring which is used to distinguish parts of the network which unexpectedly lost power, became mashed or became supplied from an alternate feeder.

5.1.6.4 Different types of Coloring shall be mainly applied for presentation of results of the running function and these functions shall be used in both online and simulation modes.

5.1.7 Tracing

5.1.7.1 The Grid Operation system shall provide a tool for the operator to trace the as-operated electrical connectivity of any selected connected electrical network facility on the display in a distinctive manner (e.g. trace path highlighted in a distinctive colour or its ends marked in a distinctive symbol).

5.1.7.2 It shall be possible to trace elements:

a) downstream from a selected element to all elements downstream;
b) upstream from a selected element to all elements feeding it;
c) in both directions from a selected point to all elements electrically connected to it;
d) downstream, upstream and in any direction to a selected type of electrical network element (e.g. upstream to a breaker); and
e) downstream to a selected type of electrical network element (e.g. upstream to a breaker).

5.2. GRAPHICAL USER INTERFACE

5.2.1 Graphical User Interface (GUI) applications shall provide a fully integrated operational solution for interaction of users with the electrical network including monitoring, control, field works and training. All Grid Operation GUI applications shall be run on the Microsoft platform and client application GUI shall have consistent look & feel.

5.2.1.1 Prominent features of all GUI applications shall include:

a) configurable user interface which allows end users to customize the system;
b) optimized user interface for normal and high activity network conditions;
c) the ability to use colours in the user interface that allows colour-coded status information/symbol

to provide situational awareness and provide feedback in response to user actions;

d) Multiple and configurable workspace layouts;

e) Visualization of geographical and schematic diagrams with user-defined symbols, with panning, zooming, layering and decluttering capabilities; and

f) Configurable dashboards with visualization of system's Key Performance Indicators with bar charts, graphs and other visual media.

5.2.2 Operator Client

5.2.2.1 Grid Operation shall have graphical user interface (GUI) application used as the Interface for operation and management of the network, access to databases and overview of network elements, operational analysis, create and manage switching plans and work requests.

5.2.2.2.It shall provide the following presentations for an end user: Schematic view, Geographical view, presentation of a desired information set, modification of a particular data set and issuing control.

5.2.2.3 The basic functionality shall consist of:

a) Graphical network presentation (schematic, geographical and SCADA view);

b) Configuring visibility profiles;

c) Managing of large networks with panning, zooming, scrolling, pilot window control and tree view;

d) User actions such as switching, manual entries, setting of operator flags, device tags and links to other network displays or their parts;

e) Setting options for displays;

f) Access to database and display of different data;

g) Searching for network elements, graphical presentation of queries;

h) Displaying sections containing alarms, confirmation of alarms;

i) Presentation of events lists and action logs;

j) Operator notes;

k) Displaying different areas of responsibility;

l) Various reports and print-outs of screen displays; and

m) Saving / restoring of windows layout.

5.2.2.4 This application shall be a multi-windows system with a combination of dynamic mimic views and text based windows.

5.2.2.5 It shall have visual indicators of the system controllability and currently active context.

The application shall use Microsoft Windows capability to support more screens and to enable a user to arrange windows across multiple monitors.

5.2.2.6 It shall provide various selections of displays and location of elements inside them. A window could be opened or selected from the main menu, or from a pop-up menu associated to a network object/element that will be shown on a network presentation within the application. It shall have rich support for navigation, searching, and selection of network parts across windows.

5.2.2.7 The system configuration shall enable positioning a set of predefined windows and adjustment of their sizes, saving the arrangement and restoring saved windows arrangements. Users can create and store different windows arrangements and set the default windows arrangement for a group of users. When a user logs in, the windows arrangement associated to their profile shall be applied.

5.2.2.8 The Grid Operation solution shall have a web interface. It shall be intended for the crew dispatchers, support dispatchers, field crews and corporate users with limited access to the system.

5.2.3 Web interface

5.2.3.1 The Web Interface shall provide insight into the current state of distribution network through the availability of all distribution network views including the topology coloring results, wide set of SCADA and network operations tabular views.

5.2.3.2 The Web interface shall include user access authentication and run in a secure web browser without any need to install add-ons or plugins.

5.2.3.3 Web interface shall not allow control of the real-time network devices connected through SCADA, however control of network devices that are not connected through SCADA can be allowed based on user permission granted by the control operator.

5.2.3.4 The Grid Operation solution shall have a Field Client application for field crews and damage assessors. Field client shall provide insight into the current distribution network values and allow field crews to obtain switching plans and provide feedback.

5.2.3.5 It shall be possible to access arbitrary network views at any moment while the connection is established with the server. In online mode, information displayed in network views shall be up to date and field crews shall see exactly the same view which is available in the Control Room.

5.2.3.6 The Field Client shall work in offline mode if there is no connection with the server.

5.2.4 Basic Features

5.2.4.1 The Basic GUI functionality shall consist of but not limited to the following:

a) Toolbar and menu for access of various options, status bar which displays the basic data about the currently selected object, and tool tips on the diagram;
b) Multiple workspaces configuration
c) Continuous and dynamic zooming from 0.1% to 10000%.
d) Continuous scrolling and panning of the diagram.
e) Selection of the entire network, substation area or a group of feeders.
f) Selection of different layouts pre-created by the Network Visualiser (for example, two separate e.g. 35 kV and 10 kV network diagrams).
g) Overview of details (schematic diagrams and parameters) of all network elements.
h) Pilot view
i) Finding element based on its Name, Alias or Custom Id attribute.
j) Quick Open
k) Equipment Browser
l) Circuit focus
m) Bookmarks
n) Selection Tools
o) Printing of the diagrams or reports.
p) Configuration of the interface.

5.2.5 Network Data Editor Client

5.2.5.1 The user interface applications within the Grid Operation environment serve a variety of tasks and shall provide easy access to data, data editing, network visualization in form of single-line diagram, logical or geographical network displays, summary reports and printing, performing complex analyses, etc.

5.2.5.2 The Grid Operation solution shall contain graphical user interface application used for manually creating, editing and deleting of network data, including editing of elements, their connectivity and their graphical representation in the form of a network diagram.

5.2.5.3 The Data Editor Client shall consist of several sub-modules, used for editing specific parts of the model and shall include the following:

a) Module for creation and editing of basic network elements (such as transformers, sections, switches etc.), as well as their connecting into objects (e.g. substations);

b) Module for defining basic circuit hierarchy;

c) Module for defining equipment catalogs shared among multiple equipment instances, and other shared data;

d) Module for configuration of SCADA telemetry model – remote units, connections, remote points, and associated configuration;

e) Module for defining signal interlocks and dependencies;

f) Module for drawing and scripting graphical symbols used in network diagrams; and

g) Module for defining, tracking, distributing and promoting pending changes to the model.

5.2.6 Data editing

5.2.6.1 Grid Operation solution shall provide creation and editing of basic network elements (sections, busbars, circuit breakers, switchgear, transformers, loads, relays etc.) and complex network elements (secondary substations, distribution substations, fault detector in supply substations). This application shall provide catalogs for elements such as transformers and sections, as well as copy/paste capability, which will enable the user to enter a large number of elements efficiently.

5.2.6.2 The following shall be provided for:

a) A backend database editor that allows backend configuration of the station’s database;

b) A tool to eliminate double entry by allowing single point of configuration for both SCADA and OMS parameters;

c) A library of pre drawn symbols of electrical elements;

d) Templates and Types (A Standard Transformer templates that allows for instantiation of multiple units whilst maintaining consistent DNP3 mapping, alarm limits and OMS attributes/properties;

e) Every change introduced must be logged with timestamp and user ID;

f) The configuration tool shall have the ability to revert the database to the previous known good state in the event of a configuration error;

g) The system shall have a drawing tool for creating network single line diagrams and for database point mapping of each station;

h) The graphics editor must use OMS topology data to dynamically colour code lines based on the energised state, nominal voltage etc;

i) The model schematic view shall be scalable to enable viewing from screens with different pixel resolutions.

j) The graphic editor software shall have an export/import feature of single line diagram to/from GIS.

k) Then graphic editor shall allow point mapping with the stations relational database.

5.2.7 Editing symbols

5.2.7.1 The grid operation solution shall contain an application that will be used for creating symbols that graphically represent elements in a distribution network. This application shall enable a user to create and modify shapes and colors for distribution network elements. Each symbol will represent appropriate elements in the network.

5.2.7.2 Symbols shall be dynamic and change appearance in accordance with electrical and dynamic attributes of elements. That means that a global symbol could be defined as a group of graphic entities.

5.2.7.3 Simple entities (shapes) shall be modified according to changes of dynamic data of a considered element. Each simple entity will represent one shape of the symbol which shall be characterized by its dynamic state: visibility, line width, line color or in the case of textual shapes with the font size, font color and font style. If custom symbols are not created for some elements, those elements shall be represented with default symbols.

5.2.7.3 The solution shall support configurable, scriptable and real-time driven symbology on all network views (Geographical, Single Line Diagram, Schematic).

5.2.8 Remote Clients (Operational Client, Configuration, Administration)

5.2.8.1 The system shall enable the use of remote clients, running on a workstation outside the datacenters where Grid Operation servers are located. In that case, the traffic between clients and the servers must go through the firewall(s).

5.2.9 Data Visualization

Visualization of data shall allow users to comprehend the status of devices in the field and interact with that representation in real time. Data visualization techniques for presentation of network related information shall include interactive network views, tabular views and configurable dashboards.

5.2.9.1. Network Views

5.2.9.1.1 Network views shall be an interactive graphical representation of the interconnected network model, and they shall play a major role in network data visualization. Network views shall allow users to engage and visualize only the information they need using pan and zoom operations. It shall enable users to identify elements upon a click, interact with a real network by issuing real switching commands from a network view.

5.2.9.1.2 Network views shall be refreshed in real time, showing up-to-date information about status and analog SCADA devices.

5.2.9.1.3 Network views shall allow quick visual analysis of the network state by different coloring criteria based on the results of topology analysis and advanced applications.

5.2.9.1.4 All network views shall share common features such as, but not limited to the following:

a) Issuing switching commands, access to additional device operations through context menus;

b) Dynamic representation of status and analogs, topological information through network coloring criteria, white-spaced attachments;

c) Graphical symbols with visual indication of devices' properties created by the user;

d) Navigation;

e) Network diagrams decluttering using visibility profiles.

5.2.9.1.5 Network views shall be geographic or schematic, by type of representation.

5.2.9.1.6 Geographic views shall represent a graphical diagram of electrical network in which electrical elements are placed in their true geographic positions.

5.2.9.1.7 Schematic views shall be logical representations of the network or its parts in which elements are placed so that topological connectivity relationships are emphasized. Based on the contents, schematic views could further be classified into transmission views, composite views, substation views, feeder views, internal views and signal views.

5.2.8.2 Tabular views shall provide a simple, user friendly, concise and clear tabular overview that incorporates features designed to help users customize, filter and page through the data in a tabular view. Tabular views shall provide sorting, filtering, navigation, freezing and export.

5.2.9.2 Auto-generated views

5.2.9.2.1 The system shall have the ability to generate auto-schematic single-line feeder diagrams on-the fly. The user shall have the ability to manually adjust the visual representation of auto-schematic views by using user configurable settings.

5.2.9.2.2 The system shall have the ability to filter devices/symbology auto-schematic views, in particular

a) filter view for only SCADA enabled devices,

b) filter view for mainline line segments only,

5.2.9.3 Areas of Responsibility (AORs)

5.2.9.3.1 Areas of Responsibility (AORs) shall provide separation of duties between users through regional division of assets. The user's rights and responsibilities within an AOR shall be determined with a set of permissions for view and control.

5.2.9.3.2 A single user could be responsible for any number of AORs. AORs shall provide the restriction of incident management, supervisory control over ICCP, tag placement, and alarm routing.

5.2.9.3.3 In real-time summaries, AORs are to be used for filtering out all data outside of the user's assigned areas of responsibility. In the event there are uncovered AORs (no user has responsibility over that area), they shall not be automatically assigned to any other user. However, all generated alarms from an uncovered AOR will be routed to pre–configured users or consoles. In cases where there are no active users or consoles configured to receive uncovered alarms, they shall be sent to all users/consoles.

6. OUTAGE MANAGEMENT SYSTEM

6.1 OMS Features

6.1.1 Outage Management System (OMS) subsystem shall be available as a set of tools and analytical functions which network operators (dispatchers) will use to manage network outages (incidents and planned outages), including trouble call, fault detection, fault location, isolation and supply restoration, crew management and outage reporting.

6.1.2 The system shall include common infrastructure, database and GUI with the OMS platform.

6.1.3 The Grid Operation solution shall have OMS, Switching Management and DMS fully integrated and synchronized.

6.1.4 Applications shall take into account active planned and unplanned outages.

6.1.5 Records of all outages shall be maintained, providing a convenient central repository of distribution outage information that could be used to support historical analysis, the calculation of outage reliability indices, and current real-time operations, such as responding to trouble calls and interacting with field crews.

6.1.6 In the case of an outage an appropriate outage record shall be created. After closure of the outage all data shall be stored in a database and available for reporting purposes inclusive of the following:

a) Outage Reports (all outages or per outage type – unplanned outages, scheduled outages, load shedding);

b) Outage Statistics (SAIFI, SAIDI, CAIDI, CAIFI, Energy not supplied, interrupted customers).

6.1.7 In addition the OMS shall include the following:

a) Network model;

b) Real-time topological model with tracing functionality;

c) Outage tracking functionality;

d) OMS Historian based on Microsoft SQL Server RDBMS;

e) Incident (job) management, providing flexible workflows matching the utilities' business procedures for planned and unplanned work, including safety management/hazards;

f) Call management, tracking customer trouble calls and utility customer service representative callbacks, integrating with a variety of call sources and using calls to predict the outage cause;

g) Customer data management, storing the customer personal data used by call management and directly by the operators, designed specifically for a secure storage of a large amount of sensitive textual data and providing high performance search tools;

h) Crew management, tracking the mobile crews and providing workflows around their dispatching, integrating with job/incident management and mobile workforce and EMD’s 3rd party vehicle tracking systems;

i) Prediction analysis;

j) Estimated Time to Restore (ETR), Estimated time of Arrival (ETA), Available to Allocate (ATA) and Available to Reserve (ATR);

k) AI Capabilities which can estimate the ETR;

l) Capabilities to interface with external systems to exchange outage information;

m) Incident form shall contain the affected substation, feeder, automatically calculate the number of affected customers and the number of unrestored customers at each switching step and voltage levels;

n) Tabular view that shows time stamped restoration steps;
o) List of all affected customers with their feeding RMU associated in a tabular view;
p) List of Transformers (Pole Type, Pad Mounted, Minisub) affected;
q) Options for Control Room Operators and Crews to fill logging comments;
r) Nested Incidents;
s) Fault Location, Switching, Isolation and Restoration embedded in the incident form to be executed;
t) Configuration incident life cycles;
u) The solution shall support configurable persona-based notification templates or outages via email or SMS;
v) The solution shall support crew assignment considering crew location, availability, workload and skillset among others. The symbols on views shall be scriptable according to these factors;
w) The solution shall have configurable switching processes fully integrated with power apps providing switching and safety validations with mobile access for field crews.

6.1.8 The OMS shall be able to run within the real-time services or within dispatcher training simulator (non-production environment), on a trainee machine, to help trainees to solve potential outages, created by a trainer. That is, the dispatcher training system shall provide the capability for the utility personnel to be trained in the use of OMS features in the same fashion as it is used in the production environment.

6.2 Incident management

6.2.1 The Vendor shall provide component/system (OMS) intended to group all the information of importance for the operator to efficiently respond to unplanned network events and organize the needed work.
6.2.2 Information shall be grouped in specific entities (incidents). Incidents created by the system shall be defined with two main attributes, Type and Subtype, which are fully configurable, and provide information like trouble calls, predicted results, dispatched crews, affected customers, switching operations and resolution details like cause and subcause.
6.2.3 The system shall have the ability to automatically populate equipment and circuit information in the incident.
6.2.4 The system shall have the ability to locate device in the system from the incident.
6.2.5 The phases the incident passes through from creation to archiving (lifecycle) shall be configurable.
6.2.6 Users shall be able to define a list of switching instructions for resolving unplanned events. This includes operations with switches, placing and removing tags, temporary elements but also free text instructions. Users shall be able to put free text comments to provide more explanation about specific tasks or actions.
6.2.7 The system shall provide the possibility to place comments provided by field crew, clearly distinguished from operator comments.
6.2.8 The system should prevent users closing an outage incident if all customers are not energized.
6.2.9 There shall be fields for further information about the resolved problem, e.g. Type of failed component, construction type and type of material being used.

6.2.10 Each incident shall have cause and subcause placeholders, with a subcause list being predefined to specific causes. The system shall have the ability to configure any number of incident causes and cause details (for example, vegetation, animal)/ (theft, tree fell in line).

6.2.11 The system shall have the ability to mark an outage incident as restored when all customers are reenergized in the OMS.

6.2.12 The system shall have the ability to configure validation rules to prevent incident completion until all mandatory fields are populated.

6.2.13 The system shall provide the capability for users to correct incident data, such as outage date/time, restoration phases, outage cause/subcause, etc.

6.2.14 The system shall have the ability to associate or merge existing outage incidents.

6.2.15 The system shall have the ability to calculate, for each incident, the total number of customers out along with duration, the total number of priority/critical customers out, the total number of hazard calls, and the total connected KVA.

6.2.16 The system shall have the ability to automatically assign and update a priority level to the incident based on configurable parameters including but not limited to Emergency/damage/safety indication from trouble calls.

6.2.17 The system shall have the ability to automatically assign and update a priority level to the incident based on configurable parameters including Number of customers affected, Number and type of priority/critical customers impacted, type of hazard calls, and Duration.

6.2.18 In case there is some remaining work to be done in the field after the outage is closed, the user shall have the ability to create follow-up planned work automatically linked to original incident.

6.2.19The operator shall be able to manually create outage or non-outage incidents directly on Network View and If an incident is created as a consequence of planned work (Switching Plan), it shall be automatically associated with it.

6.2.20 The system shall have the ability to capture and log all updates made to each incident from the time it is created until it is archived.

6.2.21 The system shall support updating of multiple incidents at once. The system shall support configurable persona-based notification templates for outages via email or SMS.

6.3 Incident visualization

6.3.1 The system shall provide an overview of incidents in the form of a dashboard.

6.3.2 The Dashboard shall incorporate the following:

a) A list of all active incidents in the system;
b) Incident location, type, subtype, status, power status, crews, calls and number of affected customers;
c) extensive filtering and sorting capabilities;
d) selective viewing that incorporates hiding columns, or setting the desired color for different entries;
e) segmentation of views for devices, crews, incident location, smart meter events, problems, switching operations, nested incidents, customers and resolution;
f) view customer restoration trends and forecasted restoration based on the estimated time of restoration; and

g) shall list inactive incidents in the system and archive to historical data base.

6.3.3 The operator shall be able to create new incident, update incident status, confirm incident, roll up an roll down, edit incident device, assign crew to an incident, add\modify\delete incident problem, update location, update resolution and insert a new comment, handle follow up work through linked switching plan, add\delete multimedia attachment.

6.3.4 Each active incident that is not closed nor cancelled shall be represented by specific symbol on the network view which is drawn next to the incident device.

6.3.5 If the incident has no device, then the incident symbol shall be drawn on the geographical location (coordinates, intersection, address, pole etc.).

6.3.6 Incident symbols shall be configurable based on incident type and subtype.

6.3.7 An operator shall be able to turn on/off colouring of the incident affected area, where different highlight coloring modes exist (e.g. based on incident status, confirmation, problem existence, outage duration range, priority range, affected customer, affected power etc.).

6.3.8 Users shall be able to use Incident symbols to open the Incident details window, but also to perform basic incident actions directly from incident context menu, such as take ownership, dispatch crews, change incident status, set ETR, roll up/down incident, merge incidents, change incident priority/type/subtype etc.

6.4. Problems (Hazards, damages)

6.4.1The system shall provide the means to add additional information about the field state of an incident in the form of problems.

6.4.2 The dashboard in 6.3 above shall include a list of all problems in the system.

6.4.3 The system shall cater for Hazards associated with specific network equipment during abnormal conditions (e.g. tree on wire)

6.4.4 Priorities shall be assigned to problems for related incidents;

6.4.5 Description of Problems shall include geographical location such as address, intersection pole or coordinates.

6.4.6 The system shall support automatic creation of problems from trouble calls.

6.4.7 Calls from the same service location shall be grouped (auto-grouping) to create a single instance of the problem to prevent duplication.

6.4.8 The system shall associate inventory lists of problems once assessment crews have inspected the incident areas.

6.5 Non-outage incidents

6.5.1 The system shall support creating incidents with non-outage type by Trouble calls with Non-Outage semantic.

6.5.2 When manually creating non-outage incident, operators shall be able to create it on any device.

6.5.3 The system shall allow for configurable outage creation and merging of non-outage calls/incidents to predicted outage incidents.

6.6 Unlocated incidents

6.6.1 A call shall create an unlocated incident if the caller (who may or may not have an account) submits a trouble call at some geographical region (street, intersection etc.). Unlocated incidents don't have affected area nor customers.

6.6.2 If a call is created by a user who exists in the Customer database, but not in the network model, the system shall create an unlocated incident.

6.6.3 The operator shall be able to manually associate unlocated incidents to electrical equipment. This shall be made possible directly from the map.

6.6.3 The system shall provide the ability to auto group location-based calls into one incident if their proximity is less than a configurable value.

6.7 Nested incidents

6.7.1 The system shall create nested incidents in a case whereby a certain customer has not been restored as a result of the callback response, or meter ping response.

6.7.2 The system shall keep outage time of nested incidents the same as the outage time of original incident and ensure that outage duration of customers within nested incidents is correctly tracked. It shall be configurable whether the system creates a nested incident immediately, or potentially nested incidents shall be created first and the user shall manually promote to nested. Potentially nested incidents shall not be visible in the Incident browser.

6.7.3 Unlike nested incidents which are applicable only to outage incidents, there shall be an option to provide topological awareness between incidents no matter the type. In case of outages, these incidents shouldn't inherit original incident's outage time.

6.8 Estimated Time To Restore (ETR)

6.8.1 The system shall include the following functions:

a) automatically calculate estimated time to restore for customers based on estimation rules configured in the system;
b) allow turning the automatic ETR assignment functionality ON or OFF per geographical area;
c) calculate and assign ETR automatically to new outage based on the day of the week, or time of the day;
d) calculate and assign ETR automatically to new outage based on outage extent, number of customers impacted;
e) calculate and assign ETR automatically to new outage based on field resource assignment priority. i.e. if an incident crew has multiple assigned incidents, their ranking shall be taken into account in ETR calculation and the ETR offset of current shall be added to the ETR value of the next incident in the crew queue;
f) calculate and assign ETR automatically to new outage based on predicted device type;
g) the ability to include Problems in incident ETR calculation, i.e. each Problem shall increase ETR for predefined amount of time;

h) the user shall be able to set fixed ETR to an incident or part of the network (region, subregion, substation, feeder). Users shall be able to suppress ETR for incident or part of network (region, subregion, substation, feeder);
i) The system shall have the ability to manually override automatically calculated ETR and prevent further automatic ETR calculation;
j) The system shall indicate whether the ETR value is automatically calculated or manually entered by the user;
k) The system shall have the ability to allow ETR updates by users inside the control room as well by field resources and the ETA shall be taken into account when calculating ETR;
l) It shall be possible to configure automatic rounding up of ETR to a higher, round value (e.g. 5, 10, 15, 30 mins);
m) The system shall have the ability to set an ETR for planned outages as the scheduled end time as indicated in the switching plan used for planned outage creation;
n) The system shall have the ability to provide visual and audible alerts when ETR is approaching by configurable amount of time;
o) The system shall have the ability to provide visual and audible alerts when ETR has passed and incident is still not restored; and
p) The system shall have the ability to track and log changes to ETRs including information on: from/to date, date/time of change and information regarding who made the change.

6.9 Prediction Analysis

6.9.1 The system shall include the following prediction functionality:

a) the ability to predict outages and create an incident at a common protective device based on received trouble calls, Smart Meter Power Down events and crew feedback;
b) the ability to predict outages on different levels, such as single customer outages, service transformers, line protective device or substation level outages;
c) the ability to predict a service transformer level outage after a configurable threshold of trouble calls (customer calls or AMI events) are received;
d) the ability to predict outage on an upstream protective device based on configurable thresholds;
e) the ability to support configuring multiple rule sets for outage prediction (profiles). Different profiles for storm and blue sky shall be available, as well as different configuration per geographical areas;
f) Prediction profile shall be able to be assigned per specific schedule, e.g. different settings shall be applied during day/night, weekday/weekend;
g) the ability to predict outages on radial network topology;
h) the ability to predict outages on meshed network topology;
i) The operator shall be able to manually adjust prediction results based on a information received from the field crews, by rolling the predicted device up to the next upstream device or down to the first downstream device;
j) the ability to allow user to correct prediction results by manually selecting the predicted device. If system predicted correct device but wrong phases, operator shall be able to manually override predicted phases;

k) the ability to re-execute outage analysis and adjust the number of customers affected when predicted outages are manually moved upstream or downstream. This action shall not be treated as a step restoration, in the case of moving an outage downstream;

l) the system shall have switch status check, i.e. all telemetered switching devices, with good SCADA quality and in closed status shall be eliminated as candidates for predicted device;

m) the system shall have analog measurement check, i.e. all telemetered voltage, current and power measurements on the path shall be processed for significant non-zero values; if the analogs have good quality and are non-zero, prediction shall consider the network part in question energized and eliminate the candidate switching devices which would leave it de-energized;

n) the ability to distinguish between trouble call reasons that indicate outage vs non-outage hazard conditions. "Partial power" call events are treated the same way as "no power" events, but only taking into account non-gang protection switching devices as prediction candidates;

o) The system shall have the ability to predict a single or a two-phase outage at a 3-phase device using the information from customer trouble calls and Smart Meter Power Down events;

p) The system shall periodically check all incidents' second predicted devices. If number of predicted incidents with the same second predicted device exceeds the configurable threshold, these incidents shall be automatically merged in one incident. Incident devices shall be appropriately updated, as well as affected customers;

q) The system shall have the ability to automatically or manually merge multi-phase outage incidents;

r) There shall be an option to speed up prediction on LV (e.g. in storm conditions), so incidents roll up to Line/Riser fuse or MV/LV transformer (depending on US/EUR network) if only one call is received from multiple service transformers. The system sh provide an option to never roll up some phase to upstream level, if only one incident exists in that phase;

s) The system shall provide an ability to avoid grouping of incidents that have difference in outage time that is greater than configurable threshold. Operators shall be able to manually lock the incident and in that way ensure the incident will not automatically change device. When the incident is locked, different incident symbols shall be presented on the network view;

t) The system shall have the ability to manually unlock an incident so that it can be re-analyzed based on current state of network and trouble calls/smart meter events;

u) The system shall provide an option whether to auto-merge existing predicted non-outage and outage incidents to upstream confirmed incidents;

v) The system shall have the ability to confirm or verify the incident location/device by operating a device;

w) The system shall have the ability to configure SCADA operations to automatically confirm an outage;

x) The system shall have the ability to manually confirm or create a confirmed incident without troubled calls by operating a device;

y) The system shall have the ability to manually confirm or create a verified incident by placing or removing a temporary state to drop load (line cuts, temp gen, etc.);

z) The system shall have the ability to present different symbols on network view for Predicted and Confirmed incidents;

6.9.2 The system shall have the ability to create a confirmed single-phase incident based on the single phase trip and single phase lock out of a 3-phase device that is gang operated.

6.9.3 The system shall have the ability to split confirmed incidents into two or more incidents to represent the nested incidents within the previously confirmed outage.

6.9.4 The system shall have the ability to keep all downstream predicted incidents at their predicted locations when an upstream device is opened (either manually or via SCADA status change) and the start time of downstream predicted incidents is outside configurable threshold from the timestamp of upstream device operation.

6.9.5 The system shall have the ability to process reclosing operations from SCADA enabled equipment to create and log momentary incidents based on configurable threshold of 'Momentary' definition.

6.9.6 The system shall have the ability to automatically close and archive momentary outage incidents.

6.9.7 The system shall have the ability to allow users to change the association of one or more customers from one service transformer to the other. Doing so shall result in re-analyzing the outage prediction logic in cases when those service transformers are impacted by existing outages.

6.9.8 The system shall have the ability to track temporary customer association changes from one service transformer to the other.

6.9.9 The system shall have the ability to automatically associate all switching operations (including temporary objects like line cuts, jumpers) that are performed within the zone of the incident.

6.9.10 The system shall have the ability to continue to capture correct switching steps, customer counts, durations as switching occurs.

6.9.11 The system shall have the ability for user to set the outage symbol manually at user-specified location.

6.10 Customer Management

6.10.1 The system shall provide a summary with basic information about the customers connected to the system and give operator the possibility to search for specific properties and locate customers on the Network View.

6.10.2 The system shall provide a report of all customers being currently affected by an incident, their current power status, outage and restoration times.

6.10.3 The system shall provide the way to observe the list of customers on Network View that are supplied below an element (transformer, feeder, breaker, section...).

6.10.4 The system shall provide the way to observe, graphically or tabularly, incident completion statistics which describes number of new outages, how they occur, and number of resolved outages, how they are fixed, during the configurable time period.

6.10.5 The system shall provide the summary that shows how many times and by what type of incident were the customers affected in the selectable period in the past.

6.10.6 Users shall be able to manually add and remove affected customers in case their topological affiliation in network model is incorrect.

6.10.7 If a user changes execution times for specific switching instructions, there shall be the logic to update customer outage and restoration times accordingly. Integrated search for customers shall be available so operators can quickly, in a single click, search per any customer-related data. Site notes providing additional, unofficial, information about customers shall be available to provide valuable information to the crews when performing work in the field.

6.10.8 The system shall have the ability to manage the different priority levels for different customers

6.11 Call Management

6.11.1 The OMS shall have a Trouble Call System that will be used by Customer Service Representative(CSR), Distribution Operators, Dispatchers, System Administrator, and by other authorized personnel to manually enter trouble calls.

6.11.2 The call management system shall have the ability to provide the following:

a) a separate lightweight tool used by CSR for call taking purposes. Calls entered via that tool shall be processed by the system in the same fashion as the calls entered via the main OMS tool;
b) the ability to each customer based on account id, phone number, address;
c) the ability to manually create new customer trouble calls;
d) the ability to manually create new trouble calls based on geographic information and not directly associated with any customer;
e) The system shall capture customer information as part of customer trouble calls, such as customer ID, Name, Address, Callback preference;

6.11.3 The system shall have the ability to enter/populate following customer trouble calls:

a) trouble information (e.g. one or more causes, remarks/comments from customer/CSR, access issues, if any to customer service location, time when customer called);
b) emergency caller information callback preferences (e.g. indication of type of callback requested, preference for callback channel (phone/email/text), do-not contact hours, alternate contact information);
c) Pictures/Video related to trouble location/cause caller information (e.g. type of caller).

6.11.4 The system shall have the ability to enter/populate following for non customer trouble calls:

a) Trouble information (e.g. location information with cross street/intersection - descriptive as well as geo coded, one or more causes, remarks/comments from caller/CSR, access issues, if any to reported location, time when customer called);
b) Emergency caller information;
c) Pictures/Video related to trouble location/cause.

6.11.5 The system shall have the ability to display active incident status information for requested customer service location.

6.11.6 The system shall have the ability to display restored incident history information for requested customer service location. The system shall provide a list of all active customer calls in the system.

6.11.7 The system shall provide a list of all customer calls and impacted customers per incident. Depending on the type of the call, the system shall create specific incident type.

6.11.8 The system shall have the ability to capture different hazard conditions as part of customer trouble calls.

6.11.9 The system shall provide an ability to enter free text comment further explaining the reason for calling. If a call comes into the area of an existing outage incident, it shall be automatically merged to it.

6.11.10 The system shall have the ability to receive non-outage trouble calls and create non-outage incidents.

6.11.11 The system shall provide the list of closed/archived trouble calls in certain periods of consideration.

6.11.12 The system shall provide the possibility of manual trouble call creation from customers list on the Network View.

6.11.13 The system shall provide the possibility of callback creation from an incident summary.

6.11.14 The system shall provide a list of all active customer callbacks and their statuses.

6.11.15 The system shall have the ability to filter the outage list for non-customer calls (unknown premise) only.

6.11.16 The system shall have the ability to filter the list of active outages to display all outages with emergency calls.

6.11.17 The system shall be capable of handling a minimum of 250 000 trouble calls per hour.

6.12 Crew Management

6.12.1 The system shall provide means for crew managers to create new crews, crew members and vehicles, duplicate crew shortcuts, refresh, delete and save changes shortcuts for the record corresponding to the selected tab.

6.12.2 The system shall have the ability to create, update, delete crew records with following set of data elements: Identification (ID, Name), Contact information, Crew type, Field Client enablement, Area of work.

6.12.3 The system shall have the ability to configure any number of crew statuses including but not limited to the following: Dispatched, Acknowledged, En Route, Onsite, Completed User shall have an ability to change actual crew assignment status.

6.12.4 The system shall have the ability to configure any number of crew types (for example, Faultsman, Repair Crew (UGM, SS or OHM, Assessment, Construction, Contractor A or B).

6.12.5 The system shall allow for Crew to contain single or multiple crew members.

6.12.6 The system shall be able to provide the possibility to predefine crew skills and to associate them to specific crew members.

6.12.7 The system shall allow for assignment of shifts to Crews. Based on the shift, system shall automatically set crew's availability.

6.12.8 The system shall provide a tabular view of all the crews in the OMS that crew managers can use to review the details on all the registered crews through this browser. Tabular list shall have sort, filter and search capabilities.

6.12.9 The system shall have the ability to locate the crew location on a network view and geographical view.

6.12.10 The system shall provide a tabular view of all vehicles (whether they are assigned to some crew or yet unassigned). Tabular view shall provide the possibility for the crew managers and other authorized personnel to look up any individual utility crew vehicle(s).

6.12.11 The system shall provide dispatchers and operators with ability to define and dispatch assignments that require an intervention by a field crew. Operator shall be able to select, assign and dispatch crews to an outage directly from the Incident Details Window. Crew symbols shall be visible next to the incident device on GUI.

6.12.12 When assigning, users shall have the ability to filter for crews with specific types, companies and number of active assignments.

6.12.13 The system shall support Crew assignment to multiple documents but shall allow for Crew to be onsite only at one entity at a time.

6.12.14 When performing crew dispatch users shall be able to see available crews optimally sorted by the system, according to their proximity to the site, workload and skills (problem types and voltage level). Weight factor of each optimal dispatch factor shall be configurable.

6.12.15 When dispatching crew, user shall be notified by alarm if crew working limit will be exceeded in configurable time amount. If crew has multiple vehicles, it shall be possible to set whether the nearest or furthest vehicle will be used to calculate distance, or the average distance will be used.
6.12.16 The system shall generate an alarm if the crew rejects an assignment. The system shall allow the user to enter rejection type and reason.
6.12.17 The system shall have the ability to capture and log all changes made to each crew assignment.
6.12.18 The system shall provide the ability for users to manually re-assign a crew to a different incident.
6.12.19 The system shall have the ability to dispatch multiple crews to different locations within the same incident.
6.12.20 The system shall support AVL integration providing crew GPS coordinates which end up showing vehicle symbols in the OMS UI.

6.13 Smart Meter Events

6.13.1 The system shall be able to predict incidents based on Power down smart meter events. The system shall be able to use events from smart meters for Outage detection, Outage verification restoration, Automatic ping of meters to check the status, Manual ping to verify meter status, Manual ping to get meter voltage value.
6.13.2 Systems shall be able to present all events that belong to certain events inside that Incident.
If "Power down" is received and "Power up" event is received during "stew" time, first event shall be cancelled, and incident shall not be created. Stew time shall be configurable. In order to reduce the load of the system, it shall be possible to block "Power down" events for customers that are already part of a known outage.
6.13.3 The system shall have the ability to allow the user to select one or more customers impacted by the outage and initiate meter ping requests for those customers.
6.13.4 The system shall have the ability to display to users, the meter ping result to indicate if power is ON
The system shall have the ability to display to a system user a status to indicate the meter ping request (initiated by same or different user) is in progress.
6.13.5 The system shall have the ability to display the results of meter ping requests on a network view
6.13.6 The system shall have the ability to display the results of meter ping requests in a tabular display
Systems have the ability to use unsolicited smart meter "Power up" event to verify customer restoration. The system shall be able to conclude whether "Power up" is related to active incident or it is some old event based on configurable timestamp.
6.13.7 The system shall have the ability to use on-demand meter ping along with real time (unsolicited) Power Down events after customers are marked as restored in order to identify if a subset of those customers are still deenergized.
6.13.8 The system shall have the ability to automatically create nested outages for customers that have been identified as still deenergized

6.14 Wire down detection

The system shall be able to automatically ping configurable number of meters and generate alarms if there are "Power up" events between predicted protection device and nearest downstream protective device, in order to detect wire down event.

6.15 Outage Management in Web

6.15.1 The system shall provide access to Outage Management data in lightweight, 'read-only' Web Application which shall require no additional software installation on the client machines, and thus, shall enable any network-supported device with the actual web browser to run it.

6.15.2 Web Application shall display list of all active incidents in the system and all information relevant to the observed incident like location, type, subtype, status, power status, crews, calls and affected customers. The browsers shall support filtering, sorting and paging and export to .csv and .pdf

6.15.3 Web Application shall provide the means for the user to see in depth details regarding the specific incidents - devices, crews, incident location, smart meter events, problems, switching operations, nested incidents, customers and resolution.

6.15.4 Web Application shall provide the means to add additional information about the state in the field to the incidents in the form of a problem. A list of all problems in the system shall be shown on a dashboard form.

6.15.5 Web Application shall provide tabular and graphical overview of the current state of the system regarding incidents. Web Application shall provide tabular and graphical overview of the problems\hazards that currently exist in the system.

6.15.6 Web Application shall offer a dashboard-type of view with ability to follow customer restoration trends and forecasted restoration based on estimated time of restoration Web Application offers a dashboard-type of view into the Outage Management which provides in configurable time statistical data about incidents that has been detected, completed and not completed.

6.15.7 Web Application shall provide the means for the user to see the incident symbols on network View. Symbols shall be configurable and can be different regarding incident type and subtype.

6.15.8 Web Application shall provide a list of all archived incidents (and all relevant information for it) in the previous period retrieved from the historical database.

6.15.9 Web Application shall provide a list of all customers with the data about the interruptions in the previous period. It shall list the affected customers with the appropriate statistics about the incidents in which those customers are included.

6.16 Managing Incidents in Web

6.16.1 The system shall provide Web applications that can be used by crew dispatchers, support dispatchers and corporate users with limited access to the system.

6.16.2 Web Application shall provide a list of all crews in the system. Web Application shall provide a list of all crew members which are available in the system.

6.16.3 Users shall be able to dispatch an incident to Crew(s) in the Web Application.

6.16.4 Web users shall be able to edit incident information like resolution fields, ETR, cut/paste affected customers. It shall be configurable whether changes need to be approved by Control Room, or there are applied without approval.

6.16.5 Web Application shall allow users to ping and poll customers' smart meters.

6.17 Outage Management for Field Crews

6.17.1 The system shall provide Mobile Application in the form of a web-based software product which provides utility field personnel with tools and information that enables them to perform their daily duties related to Outage management in an efficient manner.

6.17.2 Mobile Application shall display all incidents assigned to Users (Field Crew). Mobile Application shall also have the option to display all active incidents. Users shall be able to access incident detail from assignment lists in a quick manner.

6.17.3 Whenever the connection with the server exists, the Mobile Application shall automatically update the incidents data. User shall be able to update its assignment status.

6.17.4 Users shall be able to use Web applications to update resolution fields (e.g. cause and sub-cause) of the incident or add additional free text notes.

6.17.5 A user shall be able to attach and upload multimedia files to the selected incident. When the Mobile Application works in the offline mode, the user can open the incidents in the same way as in the online mode. The Mobile Application shall allow updates to incident data in a disconnected scenario (offline) as well.

6.17.6 When a new incident is assigned to a User, the system shall notify the User with an alert message. Mobile Application shall have capability to include alert messages, followed by a sound. Users shall be able to view an Incident, Call and Problem symbols on the network view.

6.18 Storm Management

6.18.1 The system shall have the ability to create storm/significant event record with a title/name of the event, start and end times.

6.18.2 The system shall have the ability to change configuration of prediction analysis when switching between different modes.

6.18 3 The system shall have the ability to configure impacts to ETR, when switching between different modes (storm, blue sky, etc.).

6.18.4 The system shall have the ability to manage and track storm/significant event activations by allowing users to mark one or more areas as activated or de-activated in order to drive the ability to enable/disable auto ETR postings for incidents in activated areas

6.19. Damage Assessment Management

6.19.1 The system shall have the ability to create damage assessment requests in order to support the outage restoration process. The system shall have the ability to define assessment areas, including network element, landbase location, geographical area or free-text description.

6.19.2 The system shall have the ability to track and display damage assessment status The system shall have the ability to create damage assessment requests for existing incidents.

6.19.3 The system shall have the ability to create multiple damage assessment requests for one incident. The system shall have the ability to pull up details of damage assessment results from associated Incidents.

6.20. Incident edit

6.20.1 The system shall have the ability to edit inactive(archived) incidents in order to support post-hoc outage review and correction processes.

6.20.2 The system shall have the ability to edit outage information during the quality review process, including outage duration, device operation, outage cause, customers affected and interruption intervals.

6.20.3 The system shall have the ability to reconstruct network connectivity at the time of the outage incident.

6.20.4 The system shall have the ability to edit the archived incident multiple times in order to support the review process.

6.20.5 The system shall have the ability to capture and log any changes made to the archived incidents.

6.21 Reliability analysis

6.21.1 The system shall have the ability to calculate performance indices as defined by IEEE 1366-2012 and NRS 048-6:2009 standards.

6.21.2 The system shall have the ability to calculate performance indices for a set of outages defined by outage type, cause, number of affected customers and critical customers and total outage power.

6.21.3 The system shall have the ability to provide the option to take major events into account and exclude such incidents from performance indices calculation.

7. LOAD SHEDING

7.1 Load Shedding (LS) function shall be used for disconnecting of some network parts (loads) in case of emergency situations and different types of disturbances which could occur due to lack of generation or due to overloaded network elements. This function shall provide a list of available remotely controlled loads in terms of candidates for load shedding ordered in the way that takes into account history of previous shedding (number of shedding and undelivered energy), priorities and number of consumers on feeders. This analytical function shall propose non-discriminatory load disconnection to maintain system stability in reasonable boundaries with minimum loss of revenue.

7.2 There will be two modes for two different approaches to distribution load shedding:

a) Fixed load shedding:

   Fixed load shedding shall be most used in situations when a distribution network dispatcher has to react quickly, on demand, and cut off certain amount of surplus load or a certain percentage of total system's load. The load disconnection lasts as long as the disturbance that caused it persists. After this event ends, resupplying power to disconnected loads could be performed.

b) Rotational load shedding:

   Rotational load shedding shall be most used in situations of so-called restrictions, when a disruption of a power system caused longer outages of its important elements which need more time for reparation or substitution. This mode will enable non-discriminatory load disconnection by changing disconnected groups of consumers with ones that were supplied after certain periods of time.

7.3 Groups shall be determined automatically on basis of total remotely controlled load in the system combined with the number of desired groups at that time. First group shall be the one with the smallest value of criterion function and the last group is, accordingly, with the largest. After period of time for which first group will be disconnected is defined, an alarm will inform the responsible person that rotation, or interruption of load

shedding procedure, shall take place. Next group in the line of candidates for shedding will then be disconnected. The group which was previously disconnected will get power back and shall automatically take the last place in the line of candidates for shedding, waiting for the next cycle.

8. FAULT LOCATION, ISOLATION, RESTORATION OF SUPPLY.

The Grid Operation solution shall have Fault Location & Isolation, and Restoration of Supply applications to de-energized customers. This application shall be able to operate in different modes: Automatic and Advisory.
Automatic mode shall execute automatically and without operator intervention including all calculations and switching execution required to determine the fault location, isolate the faulted feeder section and restore supply to healthy feeder sections in response to a trigger event. Only remotely telemetered devices shall be considered for automatic mode.
Advisory mode shall execute automatically including all calculations required to determine the fault location, isolate the faulted feeder section and restore supply to healthy feeder sections in response to a trigger event. It generates proposed results for the entire application process including switching plans and present the results set to the operator. The different stages of the switching plan i.e. fault isolation and supply restoration shall be identified as part of the proposed switching program. The Operator shall then be able to authorize the automatic execution of the Fault Isolation and Supply Restoration switching proposals through minimal HMI interaction.
Advisory mode shall be a configuration option within automatic mode and all algorithm rules and requirements for automatic mode shall apply with the advisory option selected.

8.1 Fault Location & Isolation, Restoration of Supply triggering

8.1.1 Shall not commence:

a) unless a permanent power system outage has been detected;
b) unless the outage is due to the operation of a device on a feeder or feeder exit i.e. no transmission or substation outages shall be capable of initiating Fault Location and Isolation, and Restoration of Supply.

8.1.2 The application shall recognize the “Recloser Lockout” signal for remotely telemetered Circuit Breakers and Reclosers.
8.1.3 The application shall not commence automatic execution unless:

a) Unless “Recloser Lockout” SCADA signal is active on the device which caused the permanent outage (the device that was open/locked out at the end of the fault sequence);
b) Unless indication of specific type of relay protection detection of fault at the device that has tripped is active on tripped device.

8.1.4 If the “Recloser Lockout” SCADA signal comes through as a historic event i.e. it must be currently active. Upon the start of an outage, there shall be a configurable timer initiated and if the “Recloser
Lockout” alarm does not become active within the time out, the application shall abort to manual execution.
8.1.5 Any outage which is created as part of a transient fault condition shall be automatically cleared upon successful reclose.
8.1.6 Any of the following conditions shall identify the device as “unhealthy” for application initiation:

a) Bad Telemetry – The switchgear has a bad SCADA quality flag against it;

b) Test/maintenance – The switchgear is undergoing commissioning or maintenance including SCADA test tag;
c) Tagged – switchgear is tagged as malfunctioning or do not operate;
d) Tagged feeder - feeder is tagged as blocked;
e) Any “unhealthy” device shall not be capable of triggering automatic application execution.

8.2 Fault Location

8.2.1 There shall be a configurable time prior to the initiation of Fault Location to allow for relevant SCADA statuses to be updated following outage recognition. The time shall be measured from the confirmation of a permanent outage or after confirmation of an application trigger (configurable).

8.2.2. The fault shall be located by tracing the feeder network model from the tripped device through all fault detection devices downstream to the end of line. The system shall be capable of tracing the feeder even if it passes through mid-line substations.

8.2.3 Any of the following conditions shall identify the device as “unhealthy” for Fault Location:

a) Bad Telemetry – The switchgear has a bad SCADA quality flag against it;
b) Tagged – The equipment is tagged as malfunctioning or out of automation service.

8.2.4 All detection devices (fault indicators, load switches and sectionalisers with fault statuses) which are marked as “unhealthy” shall be excluded as remote fault indicators within the Fault Location algorithm i.e. they shall not form the boundary of a feeder section regardless of their fault target status. In the event of "unhealthy" devices, the system shall continue to determine the fault location based on the remaining healthy devices.

8.2.1 Fault Indicators

8.2.1.1 The start of the faulted section shall be identified as the last device with fault indicator ON. The end of the faulted section shall be defined by the end of line, downstream (healthy) detection devices with fault indicators which are OFF and, optionally, by downstream (healthy) protection devices which have not operated. Any device which was already open prior to the fault occurring shall define an "end" of the feeder for tracing purposes.

8.2.1.2 The system shall be capable of recognizing a range of different faults targets (different fault type/element) as an active fault indicator for each device: A Phase, B Phase, C Phase, etc. The system shall still operate correctly if more than one fault target is present on any device.

8.3 Fault localization

8.3.1 Fault Localization shall identify the faulty section of circuit using secondary SCADA switches and re-energization of the circuit from the tripped device.

8.3.2 It shall also identify protection zones for multiple series tripping devices to limit the amount of restoration switching required.

8.3.3 Fault Localization shall only re-energize potentially faulty sections of the feeder within a configured time window of the initial fault trip.

8.3.4 The system shall be capable of autonomously executing the switching operations without operator intervention when in automatic execution mode.

8.4 Fault Isolation

8.4 1 Fault Isolation shall not commence unless the determination of the faulted section/s has been completed successfully.

It shall generate a switching plan to isolate the faulted feeder section using the closest available and applicable switches to the faulted section.

For automated operation, only remotely telemetered switching devices shall be considered.

8.4.2 The system shall be capable of autonomously executing the switching plan without operator intervention when in automatic execution mode. The switching for Fault Isolation shall be executed simultaneously for all devices.

8.4.3 The switching device on the downstream side of the faulted section shall only be opened if an alternative supply point is available beyond the device.

8.4.4 Any of the following conditions shall mark the device as “unhealthy” for automated control actions and be excluded from the available switching points within each algorithm:

a) Local Control Mode – The device is in local control mode (SCADA status).

b) Bad Telemetry – The switchgear has a bad SCADA quality flag against it.

c) Test/maintenance – The switchgear is undergoing commissioning or maintenance including SCADA test tag.

d) Tagged - The equipment is tagged as malfunctioning, control inhibited or out of automation service.

e) Bypassed – The equipment is bypassed by any closed switching device or temporary element. Note: the bypassing switch may be used where it meets the device type selection criteria.

8.4.5 Where the preferred switching device (bordering the faulted section) has one of these conditions, the Fault Isolation application shall suggest the next applicable device outwards continuing from the faulted section until a successful isolation program has been identified or no further switching options exist.

8.5 Supply restoration

8.5.1 Supply Restoration shall be capable of autonomously analysing the local power networks and determining solutions to restore supply to healthy (un-faulted) feeder sections. It shall be capable of autonomously generating and executing switching plans in order to achieve the selected restoration solution.

8.5.2 Supply Restoration switching shall not commence unless the isolation of the faulted section/s from the healthy section/s has been completed successfully. If the faulted section was only successfully isolated on one side, restoration shall be permitted but only on that isolated side.

8.5.3 For automated Fault Location and Isolation, and Restoration of Supply, the tripped device shall be closed immediately and prior to any tie option analysis for faults which have successfully been located and isolated and are not located within the first section beyond the tripped device.

8.5.4 There shall be an option available per feeder that prevents restoration from alternate sources i.e. restoration permitted from the normal source of supply only.

8.5.5 Supply Restoration shall have option to allow re-energisation of line sections which were deenergized prior to the fault occurring.

8.5.6 Automated Supply Restoration shall have options to only consider ties to feeders (disconnect or isolators) which have been configured with automatic profiles or all ties.

8.5.7 The system shall analyse all proposed solutions using only SCADA measurements and model connectivity/topology. Projected loads after restoration shall not be permitted to violate the limits of any measurement (SCADA analogs, Amps).

8.5.8 Supply Restoration shall be capable of analysing and prioritizing each restoration solution with criteria including: loading (Amps) on measurements and number of required switching operations. Where a restoration solution cannot be found due to a load constraint, but multiple tie points are available to re-supply that section, the system shall be capable of analysing multiple restoration options whereby the load is distributed between two tie points.

8.5.9 The system shall be capable of analysing a range of points at which the load can be split and selecting the best location for the split based on the multi-objective weighting criteria used for feeder tie selection. For automated execution of load splitting, the algorithm shall only consider healthy remotely telemetered switching devices. The system shall not split the load between more than two tie feeders.

8.5.10 When load splitting, the system shall ensure the splitting of the load is complete prior to the restoration of supply i.e. the system shall not permit both tie feeders to become paralleled. The system shall only execute load splitting solutions where constraint limitations are not exceeded. 8.5.11 Where multiple ties points are utilised, switching execution to restore supply shall be conducted simultaneously. If at least one tie point is available for restoration but cannot be utilised due to system constraints, the system shall attempt to conduct a partial restoration of the section by selecting and isolating additional line elements which will not be restored. The system shall ensure the isolation of these sections is complete prior to the restoration of supply.

8.5.12 For automated execution of load dropping, the algorithm shall only consider healthy remotely telemetered switching devices. The system shall only execute load dropping solutions where constraint limitations are met.

8.5.13 Prioritisation and selection of the elements to be restored shall be based on the configurable criteria that includes number of customers restored and amount of load restored.

8.5.14 Any of the following conditions shall mark the device as “unavailable” for automated control actions and be excluded from the available switching points within Supply Restoration including for automated protection group changes:

a) Local Control Mode – The device is in local control mode.

b) Bad Telemetry – The switchgear has a bad telemetry SCADA quality flag against it.

c) Test/maintenance – The switchgear is undergoing commissioning or maintenance including SCADA test mode.

d) Tagged - The equipment is tagged as malfunctioning, control inhibited or out of automation service.

8.5.15 Where the preferred switching device has one of these conditions, the Supply Restoration application shall suggest the next applicable device continuing until a successful restoration program has been identified or no further switching options exist.

Only devices which are intended to be controlled under the proposed supply restoration solution shall be considered for exclusion under Supply Restoration.

8.5.16 Fault Location and Isolation, and Restoration of Supply application shall abort with error if it detects any uncommanded device operation (operation not completed as part of an OMS switching plan) on the faulted feeder or the tie feeder during switching execution.

8.6 Configuration

8.6.1 The settings and configurations for Fault Location and Isolation, and Restoration of Supply application on each feeder shall be contained within one set of configuration parameter – profile with a custom name and comments. One profile shall be assignable to multiple feeders, while single feeder shall not have more than one profile assigned to it. The profile settings shall determine if Fault Location and Isolation and Restoration of Supply execute in Automatic or in Advisory mode.

8.6.2 It shall be possible to designate a default profile which applies the typical settings upon the creation of a new profile. If no profile is assigned to a feeder, it shall not be possible for Automatic or Advisory Fault Location, Isolation and Restoration of Supply to commence following an outage on that feeder.

8.6.3 It shall be possible to add, delete and edit Fault Location and Isolation, and Restoration of Supply application profiles.

8.7 Blocking

8.7.1 Automated Fault Location and Isolation, and Restoration of Supply application shall not be executed on any feeder which is disabled (i.e, which has Disabled “Fault Location and Isolation, and Restoration of Supply”). Any feeder which is disabled shall not be available as an automated tie to any other feeder.

8.7.2 It shall be possible for the operator to disable “Fault Location and Isolation, and Restoration of Supply” application execution based on a hierarchy of the following:

a) System wide – All feeders.
b) Region – Network model region
c) Substation – Supply point for connected feeders.
d) Feeder – Level at which disabling is actually applied. Each feeder shall have an attribute for each of the above.

8.7.3 A disable control applied at any level of the hierarchy will disable “Fault Location and Isolation, and Restoration of Supply” all feeders which sit under it in the hierarchy e.g. all feeders attributed to a disabled substation. There shall be visible indication of all feeders which are disabled.

8.7.4 When applying blocking, it shall be possible to place comments to indicate the reason for the block.

If a feeder is already disabled when a grouped disable is applied, the existing comments shall remain in addition to the new comments. If a feeder is separately disabled when a grouped disable is removed, the feeder shall remain disabled even when the group disable is removed.

8.7.5 Blocking/unblocking controls shall be available as switching plan items within the OMS switching management application, using Tag functionality applied to a feeder.

It shall be possible for the operator to tag devices out of service such that they are not included in “Fault Location and Isolation, and Restoration of Supply” or any sub-application. Tags shall be applied to the device directly from the OMS feeder diagram.

8.8 Aborting

It shall be possible for Operators to immediately stop the execution of “Fault Location and Isolation, and Restoration of Supply” for a specific outage or all outages with minimal control actions.

8.9 User displays

8.9.1 It shall be possible for Operators to display the feeder sections identified as faulted (with a possible fault) on all available network views.

8.9.2 It shall be possible to view symbolically:

a) the active status of a fault target adjacent to the relevant devices on OMS feeder/zone substation diagrams.
b) if a device has been excluded from Fault Location on OMS feeder/substation diagrams.
c) if a device has been excluded from Fault Isolation on OMS feeder/substation diagrams. Isolated feeder sections (or sections identified for isolation) shall be available for viewing on all available network views.
d) if a device has been excluded from Supply Restoration on OMS feeder/substation diagrams. The operator shall be able to view options identified for supply restoration on all available network views.
e) if a device has been excluded from Supply Restoration on OMS feeder/substation diagrams.

8.9.3 Operators shall be able to view:

a) Each of the proposed switching steps and the sequence that will be executed as part of a switching plan.
b) All parameters regarding a proposed solution including the logic for identifying the fault location, points of isolation, supply restoration option analysis, a power system load vs. capacity, excluded devices, etc.
c) All current outages and their state.

8.9.4 The solution shall provide a way to:

a) View/filter only outages on which automated “Fault Location and Isolation, and Restoration of Supply” is currently executing or has executed.
b) Navigate to the tripped device directly from the outage display.
c) Show “Fault Location and Isolation, and Restoration of Supply” operation events as system alarms and present them on the alarm page.
d) Assign “Fault Location and Isolation, and Restoration of Supply” operation events to any alarm priority level and/or alarm group colour.
e) Map the indications for an active “Fault Location and Isolation, and Restoration of Supply” execution to the single line display (auto-generated or manually drawn) for that feeder.
f) View the execution report for any current or previous execution of “Fault Location and Isolation, and Restoration of Supply”.

9. SWITCHING MANAGEMENT

9.1 There shall be a component of Grid Operation solution intended for managing procedures and all the activities related to planned and emergency work in a power grid.

It shall provide a formal process for requesting and performing switching actions on a power grid for the purposes of maintenance, network reconfiguration and outage restoration.

9.2 Specification and approval of different types of work in power grids shall include:

a) Procedures for switching and tagging equipment,
b) Placing and removing temporary elements (jumpers, cuts, temporary switches, temporary ground connections, temporary generators and mobile objects),
c) Issuing switching instructions to field crews and receiving updates from the field,
d) All validations that enforce safety of field crews and equipment

9.3 These processes shall be implemented using the following set of documents:

a) Switching Plans – Used for documenting Switching Steps that have to be performed in order to make a work safe or get the network into a condition desired for other operational reasons. In the case that a Switching Plan is approved for independent work, a field crew, to which the plan is assigned, issues and operates the instructions autonomously,
b) Work Requests – Used by control room or non-control room personnel for submitting a request to work on or near the power grid assets.
c) Safety Documents – Issued to guarantee the safety of a field crew performing the work assigned to it.

9.4 Scheduling of Switching

9.4.1 Work Request: Each Work Request shall contain the following sections:

a) Work request basic information
b) Multimedia attachments
c) Requested equipment (a.k.a. Equipment to be worked on)
d) Isolation / Protection points (depending on a Work Request type)
e) Switching Plan
f) Notes

9.4.2 There shall be a summary of all active Work Requests.

9.4.3 There shall be a summary of all archived Work Requests. An archived Work Request can be used to create a new active Work Request in draft state and it shall be possible to print a Work Request.

9.5 Gantt Chart

9.5.1 A scheduling tool shall exist, preferably in a form of a Gantt Chart in order to check if the submitted Switching Plan is conflicting with other active Switching Plans regarding current feeder, normal feeder, voltage level, AOR, scheduled date and time, etc.

9.5.2 Scheduling tool view shall consist of:

a) Tabular display, where all active Switching Plans in the system are listed,
b) Graphical representation of work duration for each document from the tabular display.

9.6 Clash Check

9.6.1 Clash check validation shall check if a planned work is clashing for work on the same current feeder and at the same time with another planned or unplanned work.

9.6.2 There shall be two types of clash check validation:

a) Automatic clash check on state transition,

b) Current clash check, on demand.

9.7 Writing of Switching

9.7.1 Each Switching Plan shall contain the following sections:

a) Switching plan basic information

Switching Plan header contains fields where the basic information about the switching can be entered (e.g. purpose, start and end date, details, field crew(s), type of work, etc.);

b) Multimedia attachments;

c) Switching Steps.

9.7.2 Switching Plan can be written manually, from scratch, in RealTime or Simulation context. In Simulation context it shall be possible to write a Switching Plan and simulate its execution.

There shall exist a way to add Switching Steps to a Switching Plan manually by dragging a device from the network view, dropping it into the switching plan and selecting an instruction from the list of available instructions.

9.7.3 In Grid Operation software there shall exist a way to automatically create a Switching Plan from Work Request based on Requested equipment and isolation points as well as a result of an OMS function, such are Fault Isolation, Supply Restoration, Load Relief, etc.

9.7.4In case of repetitive works, templates shall be used for easy (auto) creation of Switching Plans.

9.8 Approval of Switching

9.8.1 After a Switching Plan is created and scheduled, and before its execution, the plan needs to be verified and approved by one or multiple Control Room Operators.

9.8.2 Multiple levels of approval shall be configured.

9.8.3 It shall be possible to move the plan to **Simulation context** in order to simulate the Switching Plan's execution in case thorough analysis needs to be performed before the actual execution of the plan in RealTime.

9.9 Outage Report

9.9.1 The Outage report per Switching Plan (that has not yet been executed) shall contain a list of switching instructions, such as a list of customers that will be affected and a list of transformers that will be affected once the Switching Plan is executed.

9.9.2 The Outage report shall take into account both unexecuted and executed instructions. In case instructions are executed, operated date/times shall be considered, while in case of unexecuted instructions scheduled date/times will be taken into account.

9.9.3 Outage Report per Customer shall contain list of customers affected by switching instructions.

9.9.4 Outage Report per Transformer shall contain list of transformers affected by switching instructions.

9.9.5 It shall be possible to send the list to an integration adapter to be able to inform customers about planned cuts in power supply.

9.10 Execution of Switching

9.10.1 Once the Switching Plan is approved and the time scheduled for its execution comes, a Control Room Operator shall coordinate its execution.

9.10.2 It shall be possible to add new instructions to the plan, delete existing instructions and reorder them.

9.10.3 It shall be possible to open multiple Switching Plan forms at the same time in the tabbed view.

9.10.4 The operator shall be able to execute switching instructions for remotely controlled (SCADA) devices directly. If any instruction for remotely controlled device failed to be executed, the execution of other selected instructions shall be stopped.

9.10.5 The operator shall be able to issue switching instructions for manually controlled devices to a field crew. The field crew is able to update switching instructions issued to it from a mobile application.

9.11 Safety Document

9.11.1 Safety Document is a document issued by the power grid controlling authority (usually the control room operator) in order to vouch the safety to the working field crews during the work on or near power grid assets. Each safety document shall contain the following sections:

a) Safety document basic information;
b) Multimedia attachments;
c) Requested equipment (a.k.a. Equipment to be worked on);
d) Isolation / Protection points (depending on a Safety Document type);
e) Grounding points (for de-energized type of Safety Document);
f) Checklist – List of questions for a field crew performing a planned work, that the crew needs to fill in on returning the Safety Document;
g) Notes.

9.11.2 Safety Document Validation

9.11.2.1 Validation shall be available that prevents a Safety Document from being issued if the safety rules are not satisfied.

9.11.2.2 While issuing these documents for de-energized work, the built-in validation logic shall verify if the equipment to be worked on can be isolated with the provided set of isolation points and if the isolation points are opened and tagged properly. In addition, validation checks if the equipment to be worked on is grounded properly.

9.11.2.3 For energized work, on issuing this type of safety document, the built-in validation logic shall check if the working zone can be protected with a set of protection points added to the safety document, if auto-reclosing at the protection points is blocked and tagged properly, if protection points are tagged properly, if auto-transfer schemes are blocked and tagged properly.

Rules and types of tags shall be part of configuration.

9.12 Switching Validations

9.12.1 Switching Plan shall be validated manually at any moment during its creation or execution. 9.12.2 Switching Plan shall be automatically validated on a state transition to a predefined state.

9.12.3 Switching Validation application shall be used to validate any action in Switching plan in order to consider their impact on network topology and loading. Switching validation shall be divided into the following groups:

a) Topological validation - aimed to analyze the topology abnormalities after applying the considered instruction.
b) Violation validation,
c) Protection validation, - are performed whenever a switching device is operated, tap changer position changed or a temporary element placed or removed
d) Tag validation,
e) Temporary element validation, - performed on placing the temporary cuts, jumpers, generators, groundings and faults.
f) SCADA validations.

9.13 Configuration

9.13.1 Switching Instruction Configuration

It shall be possible to add a switching instruction to a Switching Plan by dragging a device (or any of its signals) from the network view and dropping it into the plan.

The list of available instructions shall be based on the message mapping of the signal. A message mapping shall be a Grid Operation network model object which stores the available states and commands for a particular type of signal.

9.13.2 Lifecycle Configuration

Lifecycle of Switching Plan shall be able to be configured, such that for different types of this document we have different states, state transitions, etc. Mandatory fields, read-only fields, visible fields shall be possible to be configured for each state. For each state different semantics can be defined, such as running automatic switching validation on transition to that state, automatic generation of an outage report, enabling switching instructions execution, etc.

10. OPERATIONAL HISTORIAN

The Operational Historian platform shall provide access to the view of the collected data enriched with a time dimension. The historian shall enable reports supporting more in-depth analysis of past conditions of the grid in ways not yet anticipated by the individual components responsible for generating the data, and not readily available out-of-the box.

10.1. Reporting Summary

10.1.1 Reporting in OMS shall be categorized according to one of several parameters, including:

a) Time
b) Type of data,
c) Report generation type, and

d) Location of the report.

10.1.2 The OMS solution shall incorporate several types of reporting:

a) various summaries and browsers,
b) power application result reports,
c) trending,
d) load duration curves,
e) various other pre-built feature-specific reports.

10.2 Predefined Reporting Components

10.2.1 Historical Data Browsers components used for presenting historical data in a tabular view shall include:

a) Historical Data Browser (HDB),
b) Historical Temporary Element Browser,
c) Historical Fault Browser,
d) Historical Tag Browser,
e) Historical Changes Summary (HCS).

The Historical Data Browser shall display historical data associated with collected analog and discrete signals and results of the load flow function. The Historical Temporary Element Browser shall be used for temporary elements. Temporary faults shall be viewed using the Historical Fault Browser. The Historical Tag Browser shall be used for tags and the Historical Changes Summary shall show any changes to collected data made using the Edit feature of the Historical Data Browser.

10.2.1.1 Historical Data Browser (HDB)

The HDB shall display data collected from signal measurements. Optionally, users with appropriate authorization levels shall also use it to make changes to historically collected values and signal flags of signal measurements.

10.2.1.1.1 Toolbar

The toolbar area shall allow the following tasks to be performed:

Add new value*,	Delete value*,	Export to csv,
Paging,	Redo*,	Filter.
Edit existing value*,	Commit changes*,	
Undo*,	Print,	

10.2.1.1.2 The Result Grid

The Result Grid shall show signal collected values for the selected OMS point. The following columns shall be available in the table when signal measurements are selected:

a) Collection timestamp;
b) Flags;
c) Value;
d) Quality.

10.2.2 Trending

The Grid Operation trending shall allow monitoring values from devices and other trend points. Values shall be telemetered analog points, telemetered status points, estimated analog points and preconfigured sets of load flow results. The visual representation of values shall be user configurable.

10.2.2.1 Accessing trends

Trends shall be able to be added from a network view via a device's context menu.

The list of devices that can be added shall be filtered by element type, name, alias or custom ID of the device.

10.2.2.1.1 Selecting interval to be observed

Trends shall be opened as either real-time or historical charts.

Real-time trend charts shall be continuously updated with the current values of the observed trend points. Historical trends shall be static, only showing the data initially requested by the user.

10.2.2.1.2 Aligning Newly Added Trends

It shall be possible to align a newly added trend to an existing x-axis. This shall allow the user to compare their values at the same timestamp.

10.2.2.1.3 The "Add 24h Trend" Shortcut

There shall be an option to add a new trend chart covering the last 24 hours available in the context menu of measurements.

Users shall have the availability to see not only the last 24 hours for a specified point, but any 24h period in the past.

10.2.2.1.4 Choosing Sampling Options

When opening a historical trend, it shall be possible to set the type of sampling to be applied to the displayed data: Raw, Average, Max, Min or Snapshot.

By default, the sampling intervals available shall be 15 min, 30 min, 1 hour and 1 day. The list of intervals shall be configurable.

10.2.2.1.5 Choosing the Trend Source.

It shall be possible to display a list of signals related to the selected network element. It shall also include a shortcut to accessing the estimation results for an individual measurement.

10.2.2.2 The Trending Window

The Trending window shall be the main area for displaying trends. There shall be the capability to open multiple trend windows at any time.

Trends shall be displayed within the trend chart.

It shall contain the following options: *Print Trends Chart, Export Trends to CSV File*, *Add Trend Value*, *Remove Trend Value*, *Hide, Trend Value Properties, Locate on View, Jump to Time,*

Zoom to Fit, Track Value, Show/Hide Trend Cursors, Freeze/Thaw *Chart, Show/hide grid and Show/hide legend*.

10.2.2.2.1 Active Trends Overview

The ***Active Trends Overview*** shall contain information that describes the following:

a) *No.* – Ordinal number of the trend,

b) *Style* – Shows a short line with the same Color and line style as the trend's line,

c) *Trend name* – User specified name for the monitored value. If not specified, it shall be created automatically.

d) **For signals, the following shall be displayed**:

- Remote point name (if remote point exists) and measurement type,
- Signal name and measurement type,

e) ***Source*** – Origin of the monitored value shall display:

- **signals** – Measurement type, information about the origin of value (real-time or history) and used calculation method (Min, Max, Avg),
- ***Value*** – Shows the trend value at trend cursor,
- ***Y axis*** – Trend axis,
- ***Phase*** – Monitored phase.

f) The ***Trend Properties*** dialog shall contain the following options:

- ***Trend name*** – User specified name for the monitored value. If not specified, it shall be created automatically,
- ***Line color*** – Used for selecting line color,
- ***Line width*** – Allows selecting line width,
- ***Line style*** – Allows selecting preferred line style,
- ***Show quality*** – Shows the signal quality,
- ***Refresh interval*** – Defines how often will the selected real-time trend be updated with a new value (minimum 2 seconds).
- ***Violation color*** – Alarm limits violation color,
- ***Alarm limits*** – It is possible to select ***None***, ***SCADA*** or ***Custom*** alarm limits.
- ***Background transparency*** – It shall be possible to adjust colour transparency of the area under the trend curve.
- The ***Remove*** button removes the selected trend.

10.2.2.3 Trend Summation

Trends for signals (analogue values) of the same type shall be able to be summed. Validation shall be performed in the background to confirm that values of the same type are about to be summed.

Summed or subtracted values shall be presented in the Trending window.

10.2.2.4 Saving Trend Charts

Trend saving option shall store the trend configuration. This shall allow restoration of the same trending configuration later. Trends shall be saved either as private, global or shared. Global trends shall be accessed by all users, while private trends can be accessed only by the user who created them.

10.2.2.4.1 Accessing Saved Trends

The Trend Charts Browser window shall be provided for browsing and loading saved trends.
It shall be possible to filter the list of saved trends.

10.2.3 Load Snapshot

Load Snapshot functionality shall provide planning and design engineers as well as operations managers the opportunity for offline analysis of past operating conditions of the grid.
Past operating conditions shall be analyzed and presented in a geographic view, a schematic view or a single-line diagram.
Snapshots shall not be loaded in real-time context.

10.2.4 Playback

Playback functionality shall allow operators and planners observation of past operating conditions by 'moving' through the time dimension, locating times and locations of network irregularities.
Playback of the system state shall be performed on any simulation context.
Playback shall not be loaded in the real-time context.
Playback shall allow skipping ahead and seeking back, as well as seeking directly to any recorded event or change of switchgear status, using them as a 'playlist'.
At any given time, an initiated Playback operation shall be stopped/paused, allowing the users to have the same analysis tool.

10.2.5 Historical Violations Summary

The Violation Monitoring process shall be designed to analyze historical voltages, temperatures, consumptions and generations for selected distribution network telemetered points.

10.2.6 Load Duration Curve

The Load Duration Curve (LDC) shall allow users to find potential problematic points in the network by determining durations of time that an observed property of the system exceeded expected amounts over a given period. This curve shall be presented relative to the maximum value of the signal for the selected time interval.

10.2.6.1 The Data Selection Filter

The system shall cater for input parameters for generating the Load Duration Curve and the desired network element, the observed property, sampling type, sampling interval as well as the time interval shall be observed.

10.2.6.2 Curve Attributes

The following data shall be obtained from the LDC attribute area:

a) **% Demand** – The load level percentage of the maximum demand.

b) **Demand** – The load at or above the selected demand measured in the chosen units.

c) **% of Time** – The percentage of the period on X axis that the load is at or above the specified level on Y axis.

d) **Duration** – The total duration of the period (format: day(s):hours:minutes:seconds) that the load is at or above the specified level.

e) **Max Continuous Duration** – The duration of time for which the load was at or above the specified level (Demand).

f) **Exceeded** – The number of occasions or consecutive groups when the specified load is attained or exceeded. It is basically the number of 'Continuous Duration' time intervals. One group of consecutive points shall be counted as 1 occasion.

g) **Above Demand** – The surface above demand level, i.e. between load duration line and horizontal selection line.

10.2.6.3 The Chart

The load duration curve shall be displayed within a chart. The value on the chart shall demonstrate the percentage of the overall selected time interval when the value of the observed property has been equal to or greater than the value of the property in a certain moment.

The chart control shall be interactive.

There shall be a capability to open Multiple Load Duration Curve windows at any time.

10.2.7 Historical Data Export

The Historical Data Export (HDX) shall be designed to export a subset of historically collected data to a format compatible with industry-standard spreadsheet editors.

10.2.7.1 Element Selection

Element selection list shall be implemented as a standard OMS find dialog, allowing the user to filter elements in the network by element type, as well as by Name, Alias or Custom Id.

10.2.7.2 Property Selection

Property selection list shall show related measurements as well as load flow and topology analysis results. The property selection list shall be filterable by each of its columns.

10.2.7.3 Export selection list

Export selection list shall contain the cumulative list of items selected for export. The list shall contain the following columns: Source, Property, Phases, Origin, Sampling.

Export list shall also be filtered by each of its columns.

There shall be a capability to save, at any time during interaction with the functionality, the current selection of measurements/function results, together with the corresponding export parameters for later use.

There shall be a capability to load a previously saved set of export parameters.

Upon completion of loading parameters, information about the load operation’s success or failure shall appear in the status bar. There shall be capabilities to export lists with defined parameters.

10.3 OMS Historical Reports

a) The Grid Operation shall store all relevant information about outages and power supply interruptions, as well as about planned works, in its historical database deployed on the historian server.
b) The Grid Operation Solution shall be able to support integration for sending OMS historical data to external system for reporting.
c) There shall be a set of out of the box reports that are used to review network performance and works done in the desired period in past.
d) Incident Historical Browser shall list all archived Incidents in previous period, based on the user defined filters.
e) A call historical browser shall list all archived trouble calls in the previous period, based on user defined filters.
f) A Customer Historical Browser shall list all affected customers with data about customer interruptions in the previous period, based on user defined filters.
g) Reports of calculated reliability indices for previous periods (Reliability Analysis Report), shall be based on IEEE 1366-2012 standard.
h) Lists of all archived Switching Plans shall be able to be retrieved from Switching Plan Historical Browser.
i) It shall be possible to build different types of generic reports, from data stored in OMS historical database, using Microsoft's SQL Server Reporting Services (SSRS).

10.3.1. Incident Historical Browser

10.3.1.1 Lists of all archived incidents shall be available to the user in **Incident Historical Browser**. Incidents in Incident Historical Browser shall be retrieved from historical databases based on user required filters.

10.3.1.2 Users shall be able to define various set of criteria and a time frame in the past, in order to retrieve desired list of archived Incidents.

10.3.1.3 Incident Historical Browser shall support extensive filtering and sorting on any of the visible columns to create various set of reports for regulatory and company management.

10.3.1.4 It shall be possible to open Incident historical detail from Incident Historical Browser with all incident related data.

10.3.1.5 Historical Incidents shall be available for editing by users who have assigned special permission to do that. Editing of archived incidents shall be logged in the event database with timestamp and user who made changes.

10.3.2. Reliability Analysis

10.3.2.1 Reliability Analysis Report shall be used for calculation of the reliability indices, for selected part of network and for user defined time period. The report shall be based on historical data about customer interruptions.

10.3.2.2 Reliability indices shall be calculated based on IEEE 1366-2012 standard. It shall be possible to calculate the following reliability indices: SAIDI, SAIFI, MAIFI, MAIFIe, CAIDI, CAIFI, CEMIn, CELIDs, CELIDt and ENSI.

10.3.2.3 It shall be possible to determine Major Event Days according to IEEE 1366-2012 standard and to exclude these days from calculations of reliability indices.

10.3.2.4 Reliability Analysis shall be able to be executed following the application of user options. Users shall be able to make various filtering of outage events which are of interest and to run reliability analysis calculation

on these filtered events. Reliability Analysis shall be able to filter incidents per cause, number of customers and power, which occurred in selected period, feeder vs substation outages, planned vs unplanned, applying Major event day exclusion or not, urban or rural feeders' exclusion, etc.

Reliability Analysis shall be possible to be executed on user request.

10.4. Custom Reporting Components

10.4.1. SQL Engine

The SQL Engine component shall represent an access layer to the Grid Operation real-time database.

10.4.2 Microsoft SQL Server Reporting Services

Different types of reports shall be available to be built using Microsoft's SQL Server Reporting Services (SSRS) and similar tools.

Reporting Services shall be installed on one physical machine, with the reporting database deployed on another one.

SSRS shall include the following features:

a) Predefined user created reports which can be run on user request,
b) Parameterized reports based on queries which allow users to enter parameter value or to choose among predefined values,
c) Drill down and drill through reports,
d) Periodic reports which can be scheduled to run at a predefined time,
e) Web access to reports,
f) Reports with charts and gauges.

10.4.3 Report Sources

There shall be several possible approaches to generating reports.

Generating and Accessing Custom Reports

There shall be the capability for Grid Operation users to generate reports by using the standard SQL Server reporting tools:

- Report Builder, integrated into SSRS,
- Report Builder as a standalone installation, or,
- SQL Server Business Intelligence Management Studio.

10.5 Data Archiving Capabilities

To prevent overwhelming of the database, data shall be periodically archived to a special media intended for long term data storage. An independent tool shall be used for scheduled archiving, de-archiving and database cleanup.

11. DISPATCHER TRAINING SIMULATOR

11.1.1 Dispatcher Training Simulator (DTS) shall be a subsystem within the Grid Operation solution that operates separately from the real–time system and provides a realistic environment for hands–on dispatcher training under simulated normal, emergency, and restorative operating conditions.

11.1.2 The training shall be based on interactive communication between an instructor and student.

11.1.3 DTS shall serve 2 main purposes:

a) Allowing personnel to become familiar with the Grid Operation system and its user interface without impacting actual substation and feeder operations,

b) Allowing personnel to become familiar with the dynamic behavior of the electric distribution system in response to manual and automatic actions by control and protection systems during normal and emergency conditions.

11.1.4 DTS shall be a comprehensive solution for training of operators/dispatchers, and cover the following aspects of the training:

a) Realistic training environment - identical to production real-time environment,
b) Field simulation (automatic and event driven),
c) Instructor console for controlling complete training environment and field simulation,
d) Scenario driven training execution,
e) Mechanisms for updating DTS from production system,
f) Training evaluation (training log, evaluation report, and playback of previously executed training),
g) Generation of a scenario based on historical data,
h) Tools for automatic generation of various scenarios.

11.1.5 In DTS environment all operators shall be in the role of Student. The person responsible for conducting and controlling training shall have an Instructor role.

11.1.6 DTS shall be able to use the currently active network model from the Production system or any other past model and network conditions from the Historian.

11.2 DTS overview and functionality

11.2.1 DTS shall provide the ability to simulate, present, analyse and control of the electric network.

11.2.2 Network Simulator shall combine simulation of:

a) Electric network;
b) Telecommunication network;
c) Human interaction.

11.2.3 Different types of remote communications (SCADA, Advanced Metering Infrastructure, and GPS) shall be simulated through different interfaces.

11.2.4 DTS shall use and emulate all production interfaces.

11.2.5 DTS shall be used to train authorized personnel to become familiar with the dynamic behavior of the electric distribution and transmission systems in terms of realistic response of the system due to manual and/or automatic actions during normal and emergency conditions.

11.2.6 DTS shall include a complete replica of the Production Grid Operation user interface and engine, standard simulation context for the purpose of what-if analysis, plus the simulation engine which simulates the real-time telemetered state variables and switch statuses.

11.2.7 DTS shall be able to train multiple operators/students concurrently.

11.2.8 Each student shall be connected to the student environment using the student client.

11.2.9 Student client shall mimic the full control room experience, displaying the telemetered, manual data values and allow the student to interact with the full simulation.

11.3 Student Environment

11.3.1 Training environment for students in DTS shall be identical to the production Real-time environment, in which operators work.

11.3.2 DTS shall enable students to observe the network and perform appropriate actions to remove all the disturbances which were caused by simulated scenarios/events.

11.3.3 Student workstation shall allow performing all of their responsibilities as in the control room, including:

a) SCADA Control,
b) Manual Control,
c) Switching Sequences,
d) View / Acknowledge Alarms,
e) Customer Calls browsing,
f) OMS Incident management,
g) OMS Smart Meter Activity supervising,
h) Field Crew Position monitoring,
i) Execution of Switching Plan instructions.

11.4 Instructor Environment

11.4.1 The instructor environment shall enable the instructor to configure and control the training session.

11.4.2 The instructor environment shall have full access to the actual state of the simulation on student consoles, as well as access to the history of student actions.

11.4.3 The instructor environment shall enable instructor intervention during the simulation/training in order to change the conditions or to accelerate events that are not preset in advance.

11.4.4 The instructor shall act as the personnel with whom a dispatcher communicates and can modify the system accordingly.

11.4.5 The instructor environment shall enable the instructor to create events/scenarios using the following:

a) Standard control windows,
b) Context menu of elements from the network view,
c) Paired events (from scenario list as inverse events),
d) Using field events monitor,
e) Scenario events toolbar.

11.4.6 Multiple events shall be saved as event scenarios.

11.4.7 Each event in a scenario shall be set with a different occurrence probability and a different period in which it may or may not occur.

11.4.8 Events inside scenarios shall be grouped together by the Instructor’s choice.

11.4.9 Event groups shall be added, imported, moved, deleted from or merged into another scenario thus making complex scenarios easier by using premade simple scenarios.

11.5 Training Process

11.5.1 Instructor shall be responsible for providing an up-to-date state of DTS if needed, in order to train students in conditions which are similar to conditions in Production environment.

11.5.2 The DTS shall enable the instructor to prepare scenarios and complete a training plan before starting a training session with the students.

11.6 Training Session Initialization

11.6.1. Training session shall be properly initialized when the initial state of DTS is properly set and scenario options configured.

11.6.2. Initial state shall be set when an appropriate network model version (static model) and saved case (dynamics state) are applied to the Network Simulator and Student RealTime environment, and data is removed from the Student environment from the previous session.

11.6.3. Initial state of the DTS shall be set during a reset procedure of the Network Simulator, and that procedure shall include:

a) Clearing of active field events,

b) Initialization of field crew positions,

c) Loading of specified version of static model to Network Simulator,

d) Loading of Network Simulator case,

e) Cleanup of student's data,

f) Loading of specified version of static model to Student RealTime,

g) Loading of Student RealTime case.

11.6.4. Network Simulator reset shall be performed during the following activities:

a) Load existing scenario - DTS shall be initialized using information stored in scenario options of a loaded scenario.

b) Create new scenario - DTS shall be initialized using information set by an instructor when creating a new scenario or using default parameters without set model version and case.

c) Play scenario – DTS shall be initialized using currently set scenario options before each playing of a scenario, because previous activities (adding of some new events in idle, recording, or previous playing mode) in a current training session have an impact to state and future activities of DTS.

11.7 Scenario Preparation

11.7.1. Different scenario events shall be created.

11.7.2. During scenario creation (recording) the Instructor shall add new events, delete/edit/move/copy existing events, group events, delete/move groups, change the group of one event or group of an entire group, edit scenario options and edit the scenario description.

11.7.3. Creating a scenario shall be performed on the Instructor machine only. Default options shall be provided, so an Instructor can use those settings. Scenario options shall be changed later, but only in a case where there are no applied events in the current scenario session.

11.7.4. A usable scenario shall be performed only in Recording mode, because only in Recording mode can a scenario event can be created or set as playable. Instructor shall create a scenario in on-line (connected students) or off-line (disconnected students) mode.

11.7.5. The next step shall be to insert appropriate events. The following events shall be created:

a) Discrete Value Change Event,

b) Load Scaling Event,

c) Fixed Measurement Override Event,

d) Analog Value Change Scenario Event, • Measurement Scaling Factor Event,

e) Loss of Control Event (Switch Failure),

f) Permanent Fault Event,

g) Transient Fault Event,

h) Tagging Event,

i) Loss of Communication Event,

j) Misoperation Event,

k) Customer Call Event,

l) Statistical Customer Call Event, • AMI Notification Event,

m) Field Crew Event.

11.7.6. A scenario shall be saved to be replayed at a later time after creating the desired events.

11.7.7. It shall be possible to load an appropriate scenario created/saved.

11.7.8. Scenario shall be edited by adding new events, copy-pasting and/or deleting existing events.

11.7.9. It shall be possible to edit individual scenario events by changing the event offset time, and event group.

11.7.10. It shall be possible to perform editing of event groups: moving to another group, delete a group, or change the time offset of the group.

11.7.11. To merge scenarios at least one scenario shall exist. User shall open one scenario in the DTS Scenario Recorder/Player window on which the merge will occur.

11.7.12. There shall be an additional capability to save a scenario on the local drive.

11.7.13. There shall be ability to quickly and easily create scenarios based on existing historical changes collected in the production system, or to generate events randomly based on defined criteria.

11.8 Training Execution

11.8.1. Precondition for successful training execution shall be the existance of a scenario which is to be executed, existance of associated initial state (saved case), and existance of associated network model version.

11.8.2. Instructor shall control scenario execution by performing the following actions:

a) Start, pause, and end scenario execution,

b) Execute scenario step by step,

c) Start scenario from specified snapshot,

d) Increase/decrease speed of scenario playing,

e) Send an event on the fly (during playing),

f) Simulate ‘field crew’ for manipulation of manual points in the field,

g) Set number of repetitions.

11.8.3. Students shall actively perform supervisory controls of:

a) Alarms,

b) Events,

c) Telemetered values,

d) Results of the DMS calculations,

e) Incidents,

f) Customer calls,

g) Smart meter events,

h) Moving of field crew’s vehicles.

11.8.4. Students shall perform various actions to resolve the situation:

a) Change the status of remotely controlled switches and switches without remote control,

b) Calling the field crew (the student will phone the instructor who pretends to be the field crew),

c) Creating switching plans and issuing instructions to simulated field crews,

d) View and acknowledge alarms,

e) Performing what-if analysis in Simulation context.

11.9 Training Evaluation

11.9.1 Training Review

11.9.3.1. DTS shall provide facility for students/trainees to review the training session at the end of the training period.

11.9.3.2. The scores obtained in 9.6.1 above shall be stored in the historical database

11.9.2 Training Evaluation Report

11.9.2.1. DTS Training Evaluation Report (TER) shall provide a presentation of statistical information about the training session using data collected in the historical database during a training session.

11.9.3 Training Log

11.9.3.1. The system shall monitor the trainee responses for voltage and overload violations; and outages. The instructor shall have the ability to view all the steps/ actions taken by trainee during a training session.

11.9.3.2. Training log shall consist of the following types of events:

a) Scenario events and events issued by the instructor,

b) Events issued by students.

11.10 Simulated Field Logic

11.10.1 Event based

11.10.1.1. Advanced level of simulation shall be provided by various field events which can be applied to the

11.10.1.2. Network Simulator from the Instructor's client.

11.10.1.3. These events shall be a representation of field events which can usually happen in the real field.

11.10.2 Load and Generation Scaling

11.10.2.1. Load scaling scenario event shall be used to change load/generation of a specified circuit or consumer immediately or in a linear fashion.

11.10.2.2. Load and generation shall not be changed separately for a specified circuit, only at the same time – when load is changed generation must be specified too, and vice versa.

11.10.3 Automatic

11.10.3.1. Another level of simulated activity shall be automatic simulation of regulation and protection equipment according to the network state, which can be changed by issuing a command from the dispatcher's control center or setting scenario field events from the Instructor's client connected to the Network Simulator server.

11.10.3.2. There shall be automatic simulation of customer calls, smart meter notifications, smart meter ping responses, complete AMI infrastructure, and field crew movement and assignment execution. The following conditional reactions shall be recognized:

a) Switch status shall be changed → measurements shall be changed, customer calls shall be generated, AMI notifications shall be generated,

b) Control Active Setting and Control Set Value shall be changed → tap position shall be changed, breaker is opened/closed,

c) Fault shall be set → breaker/fuse shall be opened, fault statuses and fault recorders shall be set, reclosing shall be activated,

d) Load Scaling shall be changed → measurements shall be changed, tap positions shall be changed, switch statuses shall be changed,

e) Frequency shall be changed → breakers shall be opened, measurements shall be changed.

11.10.4 Automatic Scenario Generation

11.10.4.1. The system shall be the ability for automatic generation of scenarios based on a specified set of parameters.

11.10.4.2. There shall be an ability to quickly and easily create scenarios based on existing historical changes collected in the production system, or to generate events randomly based on defined criteria.

11.10.5 Export Scenario from Production History

10.10.5.1. This functionality shall provide the ability for the DTS Instructor to obtain an interesting scenario from the historical data of the production system, and to conduct dispatcher training using it.

10.10.5.2. Exporting shall be provided in the system/zone which also contains a representative history of changes that have occurred in the production system (DMZ zone/system). The Instructor shall be responsible for the request to export of the historical scenario from a user in DMZ having 'Simulation Admin' authority.

10.10.5.3. All changes made in the production system shall be persistent in the historical database, and shall be extracted as a scenario which can be reproduced in DTS.

11.10.6 DTS Update

11.10.6.1. DTS system shall be updated with the appropriate data from the Production system. The following data shall be synchronized:

a) Version of the network model,

b) Dynamics state (saved case),

c) SCADA configuration (RealTime database).

12 Project Management Reporting Requirements

The successful bidder shall submit the following reports:

12.1 Weekly Status Reports

a) Work completed
b) Work planned
c) Risks and issues
d) Mitigation actions
e) Resource allocation

12.2 Monthly Progress Reports

a) Earned value management (EVM) progress
b) Schedule performance
c) Budget utilisation
d) Updated risk register

12.3 Stage Gate Reports

At the end of each milestone:

a) Requirements sign-off
b) Design approval
c) FAT summary
d) SIT/UAT reports
e) Go-live readiness

12.4 **Technical Documentation & deliverables**

12.4.1 Standards compliance matrix mapping each SoW requirement to the applicable standard clause (IEC 61968/70, IEC 61850, IEC 60870-5-104, IEC 62351, IEEE 1547, NRS 048, NRS 097).

12.4.2 Test plans & reports for interoperability, functional performance, communications, cybersecurity, and KPI validation (IEEE 1366).

12.4.3 Operational procedures for emergency load reduction & restoration (aligned to **NRS 048-9**), switching management, and DER operational coordination.

12.4.4 Technical Documentation

a. System architecture
b. Interface control documents (ICDs)
c. Network model documentation
d. Cybersecurity policies
e. Training manuals
f. O&M manuals

13 **Acceptance tests & verification**

13.1 Interoperability & model exchange test

- Import/export of distribution model using **CIM (IEC 61968/70)**; round-trip validation with checksum and object count equality; resolution of naming and mapping per agreed profiles.

13.2 Functional performance test suites

- **FLISR drills** on selected feeders (with simulated fault injections) to measure isolation and restoration time and customer counts vs. baseline.
- **Volt/VAR optimization** trial with independent **NRS 048-2** voltage compliance verification and CVR energy savings metering campaign.
- **DER interoperability** test per **IEEE 1547**—validate volt-VAR, volt-watt, frequency ride-through, remote function enable/disable; include **NRS 097-2-3** LV constraints checks in ADMS workflows.

13.3 In addition the above, the Grid Operation solution shall be accepted based on:

a) Successful completion of all functional and integration tests
b) Network model accuracy above 95%
c) SCADA telemetry availability above 98%
d) Demonstrated FLISR, VVO, OMS functionality
e) Operator training completion
f) System stability for 30–60 days post go-live

13.4 Communications conformance

IEC 61850: verify MMS reporting, GOOSE performance, and SCL engineering files;

IEC 60870-5-104: companion standard conformance (APCI/ASDU handling, start/stop, sequence numbers), including test cases per technical specs.

13.5Cybersecurity verification

IEC 62351 coverage audit (protocol protections, RBAC, certificates, event logging), red-team exercise, and remediation tracking; provide artifacts and test results.

13.6Reliability KPI validation (IEEE 1366)

Establish baseline (12 months) and compute **SAIDI/SAIFI/CAIDI** according to the IEEE 1366 methodology (with and without MEDs); after 12 months of operation, demonstrate target improvements with third-party review.

13.6.1 Performance KPIs

a) Reduction in SAIDI/SAIFI

b) Real-time visibility of all medium-voltage feeders
c) Faster outage detection and restoration
d) Integration uptime > 99%
e) Response time for SCADA telemetry < 2 seconds

13.7 Data quality, governance, and change management

a) **Model accuracy**: ≥ **99%** match between OMS model objects and field/GIS for critical elements (breakers, switches, regulators, capacitors, transformers) at acceptance, sustained ≥ **98%** thereafter through controlled updates.
b) **Operational data retention & auditability**: Maintain event logs, switching orders, operator actions, and security events with traceability per utility policy and IEC guidance.
c) **Training & competency**: Deliver operator and field crew training aligned to Grid Operation functions (FLISR, VVO/VVC, OMS, DERMS) with practical scenarios drawn from **NRS 048-9** emergency operations.

14 Timeframes:

Deliverable	**Description**	**Milestone**
Project Kick-off	Project charter, governance, schedule	Month 0
Requirements & Functional Specification	Workshops, gap analysis, documentation	Months 1–3
System Design Baseline	Network model design, cybersecurity plan, interfaces	Months 3–4
Procurement of Hardware/Software	Ordering, delivery, environment setup	Months 4–6
Digitisation of Mimic Board	Ordering, delivery, setup Network Model and GIS integration	Month 4-6
ADMS Configuration & Development. Data Migration	Load models, OMS config, SCADA points, algorithms	Months 6–12
Integration Development	GIS, AMI, ERP, CRM, SCADA	Months 8–14
Real-time operational interfaces	SCADA adapters, GIS sync, OMS links, AMI integration, WMS/CIS interfaces	Months 14-18
Development of advanced modules	FLISR, DER Management, VVO, Outage Analytics, State Estimation	Months 16-20
Change Management	Before deployment to production	Months 15–20
Administrator Training	Install and configure in control room + DR site	Months 20–22
User Training	End-to-end validation	Months 22-23
User Acceptance Testing (UAT)	Operator acceptance (Software)	Months 24–25
Pre-SAT	Validation/Verification	Months 25-26
Completion and acceptance of SAT	Operator acceptance (Hardware)	Months 25-26
Go-live of operational system	Completed Commission	Months 26–30
Final Project Closure	Documentation and close-out	Months 30–36

SECTION 8: BILL OF QUANTITIES / SCHEDULE OF RATES / ACTIVITIES

Item	Description / Item Code	Unit of Measure	Estimated Quantity Required	Price excluding VAT		VAT		Price including VAT	
				R	c	R	c	R	c
Grid Operation Solution									
1	**Grid Operation Hardware**								
1.1	Server hardware (on-prem)	Each	1						
1.2	Storage systems	Each	1						
1.3	Networking equipment	Each	1						
1.4	Control room operator consoles	Each	1						
1.5	Video wall / displays	Each	1						
1.6	Disaster Recovery site hardware	Each	1						
2	**Grid Operation Software (inclusive of all modules as per the technical specification)**	Each	1						
3	**Supervisory Control and Data Acquisition (SCADA)**	Each	1						
4	**Training**	EMD Team	1						
							Total of Prices (carried forward to the Tender Form):		

SECTION 8: BILL OF QUANTITIES / SCHEDULE OF RATES / ACTIVITIES

Item	Description / Item Code	Unit of Measure	Estimated Quantity Required	* Price Year 1 (excl)		* Price Year 2 (excl)		* Price Year 3 (excl)	
				R	c	R	c	R	c
1	**Grid Operation Hardware**								
1.1	Server hardware (on-prem)	Each							
1.2	Storage systems	Each							
1.3	Networking equipment	Each							
1.4	Control room operator consoles	Each							
1.5	Video wall / displays	Each							
1.6	Disaster Recovery site hardware	Each							
2	**Grid Operation Software (inclusive of all modules as per the technical specification)**	Each							
3	**Supervisory Control and Data Acquisition (SCADA)**	Each							
4	**Training**	EMD Team							
				Year 1		Year 2		Year 3	
			Sub-Totals :						

Item	Description / Item Code	Unit of Measure	Estimated Quantity Required	* Price Year 1 (excl)		* Price Year 2 (excl)		* Price Year 3 (excl)	
				R	c	R	c	R	c
							Sub-Total (excl) = Year1 + Year 2 + Year 3:		
							VAT:		
							Total (incl) carried forward to the Tender Form:		

SECTION 9 : OFFICIAL TENDER FORM

Part A: OFFER BY TENDERER - In response to **Tender Number : 34611- 5E** I / we hereby offer to supply the goods / services detailed hereunder in accordance with the Technical Specification, and subject to the Standard and Special Conditions of Tender (Goods/Services), and General and Special Conditions of Contract, which accompanied your Tender (with which I / we acknowledge myself / ourselves to be fully acquainted) at the price stated below, or in the case of individual rates are indicated in Section 8 : Bill Of Quantities / Schedule of Rates / Activities.

TENDERED PRICE EXCLUSIVE OF VAT	VAT AMOUNT	TENDERED PRICE INCLUSIVE OF VAT
R	**R**	*** R**
*** AMOUNT IN WORDS (incl. VAT):**		
.....		

I / We hereby agree that this tender will hold good and remain open for acceptance as specified in the Conditions of Tender or during such other period as may be specified in the Special Conditions of Tender.

eThekwini Vendor Portal Registration Number: **PR**

C.S.D Registration Number: **MAAA**

S.A.R.S Pin Number: _____

Completion of the following is compulsory. Failure to declare the following will invalidate your offer.

Declaration of Interest

Are any of the entity's directors, managers, principle shareholder or stakeholders currently in the service of the state or have been in the service of the state in the past twelve (12) months? ☐ **Yes** ☐ **No**				
Is any spouse, child or parent of the entity's directors, managers, principle shareholder or stakeholder currently in the service of the state or have been in the service of the state in the past twelve (12) months? ☐ **Yes** ☐ **No**				
Name of entity's member	**Position in Entity**	**Name of Relative (if applicable)**	**Name of State Institution**	**Nature of Relationship**
Do you or any other directors, managers, principle shareholder or stakeholder of your entity have any relationship (spouse, family, friend, associate) with persons in the service of the state and/or who may be involved with the evaluation of this quotation? If yes please furnish particulars below ☐ **Yes** ☐ **No**				
Name of entity's member	**Position in Entity**	**Name of Relative (if applicable)**	**Name of State Institution**	**Nature of Relationship**

Refer to the Consolidated MBD Documents in Section 4(d) for the definition of "in service of the State"

*** Signature :** _____ *** Name** *(capitals)*: _____

Date: _____ **Capacity:** _____

*** Name of Business:** _____ **Tel:** _____

Address: _____ **Fax:** _____

_____

*** Denotes Mandatory Information**

Failure to complete the Mandatory Information and sign this Tender Form will invalidate the tender

Part B: ACCEPTANCE BY PURCHASER - The Purchaser, as represented by the following Official, hereby accepts the Tenderer's offer in terms of the Conditions of Tender, Specifications, and Conditions of Contract.

Signature: **Name** *(capitals)*:

Date: **Capacity:**

SECTION 10: ANNEXURES A: TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION SOFTWARE REQUIREMENTS

RETURNABLE DOCUMENT 1

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
1.0	**SOFTWARE**		
1.1	**Application Services on the application layer**		
a)	The FEP supports distributed architecture to accommodate disruptions during commissioning and maintenance in accordance with **clause 3.5.2.2.4**	Yes	*Yes/No
b)	The FEP communication protocol conforms to DNP3 level 3 over TC/IP/WAN in accordance to **clause 3.5.2.2.5**	DNP3	
c)	The FEP acts as the DNP Master to synchronise field device clocks, ensuring Sequence of Events accuracy in accordance to **clause 3.5.2.2.6**	Yes	*Yes/No
d)	The FEP supports both solicited and unsolicited data reporting modes in accordance to **clause 3.5.2.2.7**	Yes	*Yes/No
e)	The FEP supports integrity polling of field devices at configurable polling intervals for each station in accordance to **clause 3.5.2.2.8**	Yes	*Yes/No
f)	The FEP's scan rate and polling rate is configurable for each station in accordance to **clause 3.5.2.2.9**	Yes	*Yes/No
g)	The FEP supports the following control mechanism: Direct Operate, Select before operate in accordance to **clause 3.5.2.2.10**	Yes	*Yes/No
h)	The FEP supports single and double-point binary input/output, in accordance to **clause 3.5.2.2.11**	Yes	*Yes/No
i)	The FEP supports Analog input/output with floating point and various scaling factors in accordance to **clause 3.5.2.2.12**	Yes	*Yes/No
j)	The FEP supports DNP3 file transfer objects to allow remote retrieval of disturbance records in accordance to **clause 3.5.2.2.13**	Yes	*Yes/No
1.2	**Historical Services at the database layer.**		
a)	Historical services shall be based on Microsoft's SQL Server with modules responsible for the collection and long-term storage of all auditable actions and events.	Yes	*Yes/No
b)	The power grid data model shall include all changes which are stored in increments described by changesets and other data repositories.	Yes	*Yes/No
c)	All application server components shall utilize the Microsoft Windows Server operating system, inclusive of Microsoft Windows Server latest version and Microsoft SQL Server latest version	Yes	*Yes/No

(This document shall be completed, signed and returned with bid documents of which it forms part.)

* Delete whichever is not applicable

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date:**

SIGNATURE: _____ _____

SECTION 10: Annexure A: TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION SOFTWARE REQUIREMENTS

RETURNABLE DOCUMENT 1 (continued)

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
1.0	**SOFTWARE**		
1.3	**System Architecture**		
a)	The quality assurance environment provides full functional, configuration and performance testing of the entire solution having similar configuration to the production system in accordance with **clause 3.5.4.1**	Yes	*Yes/No
b)	The training environment incorporates provide the capability to train System Operators by simulating both the distribution system and the OMS functions that are isolated from the production Core system in accordance with **clause 3.5.4.2**	Yes	*Yes/No
1.4	**Architecture Principles**		
a)	Deployment of the grid operation solution at the primary and redundant data centres in accordance with **clause 3.5.3.1.1**	Yes	*Yes/No
b)	Failover transitions between the two data centres shall be possible with switchover functionality and the data replicated between the two systems in near real-time in accordance with **clauses 3.5.3.1.1 and 3.5.3.1.2**	Yes	*Yes/No
c)	The failover of any faulty component shall be immediate and seamless to the users in accordance with **clauses 3.5.3.3**	Yes	*Yes/No
d)	The Grid Operation solution shall be virtualized and hosted in virtual machines, which are deployed in physical hosts with enough hardware resources to host all planned VMs. Microsoft Hyper-V or VMWare hypervisors shall be used in accordance with **clauses 3.5.3.4**	Yes	*Yes/No
e)	The Grid Operation client applications are deployed on workstations with Microsoft Windows operating system in accordance with **clauses 3.5.3.5**	MS Windows OS	
f)	The system shall have a process historian database that stores network events and load reading data in accordance with **clauses 3.5.3.6**	Time series Database RDBMS	
g)	Grid Operation services shall be vertically and horizontally scalable in accordance with **clauses 3.5.3.7**	Yes	*Yes/No
h)	This architecture is designed to enable DNS functionality in accordance with **clauses 3.5.3.8**	Yes	*Yes/No
1.5	**The Disaster recovery time objectives**		
i)	Recovery Time Objective in accordance with **clause 3.5.3.1.9 (a)**	< 30min	
j)	Recovery Point Objective in accordance with **clause 3.5.3.1.9 (b)**	< 5min	

* Delete whichever is not applicable

I, the undersigned, who warrants that they are authorised to sign on behalf of the Tenderer, confirms that the information contained in this form is within my personal knowledge and is to the best of my belief both true and correct.

NAME (Block Capitals): _____ **Date:**

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Annexure B: TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION HARDWARE REQUIREMENTS

RETURNABLE DOCUMENT 2

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
2	**HARDWARE**		
2.1	**SERVERS**		
a)	Hardware configuration utilizes industry standard hardware specifications in accordance with clause 4.1.1	Yes	*Yes/No
b)	Servers contain redundant teamed network cards and connection to storage VM hosts and servers have appropriate adapters and "boot from SAN" option supported in accordance with clause 4.1.2	Yes	*Yes/No
c)	The system shall have a GPS clock to serve as the time source for all networked devices in accordance with clause 4.1.3	Yes	*Yes/No
d)	The system shall have two real-time database servers operated on a hot standby mode with less than 1s failover in accordance with clause 4.1.4	Yes	*Yes/No
e)	The system shall have two production servers, where the control operator connects their workstations for monitoring and control of the network in accordance with clause 4.1.5	Yes	*Yes/No
f)	The system shall have a webserver to host the web-based portal that give access to the process historian in accordance with clause 4.1.6	Yes	*Yes/No
g)	The system shall have replication servers stationed at the Disaster Recovery Centre in accordance with clause 4.1.7	Yes	*Yes/No
h)	**List the Manufacturer Make and Model of Server Hardware provided by the Tenderer:**		

* Delete whichever is not applicable

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SECTION 10:ANNEXURE B - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION HARDWARE REQUIREMENTS (continued)

RETURNABLE DOCUMENT 2 (continued)

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
	Hardware (continued)		
2.2	**Backup Storage**		
a)	The solution includes SAN (Storage Area Network) devices in accordance with clause 4.2.1	Yes	*Yes/No
b)	The solution includes dual storage controller with SSDs for VM images, SSDs or 7k2 disks for SQL databases, and 7k2 disks for data backup files in accordance with clause 4.2.2	Yes	*Yes/No
c)	The solution includes connections between VM hosts/servers and storage controller with a pair of 16 Gb SAN switches in accordance with clause 4.2.3	Yes	*Yes/No
d)	The solution includes backup files located either in SAN devices used by application servers or inside SAN/LTO Backup devices in Management environments in accordance with clause 4.2.3	Yes	*Yes/No
e)	The solution includes SAN capacity storage space for virtual machine images, data stored in Microsoft SQL databases, and "boot from SAN" options in accordance with clause 4.2.4	Yes	*Yes/No
f)	**Backup Hardware Manufacture name**		
g)	**Backup Hardware Model number/s**		
2.3	**Networking**		
a)	Switches shall be deployed as stackable pairs, with 48 or 24 ports in accordance with clause 4.3.1	Yes	*Yes/No
b)	Connections from servers to corresponding LAN switches shall be redundant, and redundant teamed network cards shall be placed in every VM in accordance with clause 4.3.2	Yes	*Yes/No
c)	For security of all internal and external communications, firewalls shall be used in accordance with clause 4.3.3	Yes	*Yes/No
d)	**Networking Hardware Manufacture name**		
e)	**Networking Hardware Model number/s**		
2.4	**End-User PC Workstation**		
a)	End-user PC workstations specification shall include configuration like CPU (Intel Xeon, 4 cores, 3.0+ GHz), RAM (16 GB DDR4), Graphic adapter (e.g. NVIDIA Quadro P600 or P620), 1 TB SATA HDD and Windows 11 operating system or higher/better.	Yes	*Yes/No
b)	**Workstation Hardware Manufacture name**		
c)	**Workstation Hardware Model number/s**		

* Delete whichever is not applicable

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SECTION 10: ANNEXURE C - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION MODEL MANAGEMENT REQUIREMENTS

RETURNABLE DOCUMENT 3

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
3	**MODEL MANAGEMENT**		
3.1	**Network Model**		
a)	Network Model shall be an object-oriented model of electric power networks based on the Common Information Model (CIM) in accordance with **clause 5.1.2.1**	CIM	
b)	The Grid Operation Network Model includes any voltage level in accordance with **clause 5.1.2.3**	LV/MV/HV	
c)	The Grid Operation Network Model shall be capable of modeling equipment and equipment containers level in accordance with **clause 5.1.2.4**	Yes	*Yes/No
d)	The Network Models updated through the configurable network model maintenance process, with model synchronization in accordance with **clause 5.1.2.5**	Yes	*Yes/No
e)	Network Model data changes are introduced via changesets in accordance with **clause 5.1.2.6**	Yes	*Yes/No
f)	The solution shall support import and export of multiple SCADA entities via files from the network model editor in accordance with **clause 5.1.2.8**	Yes	*Yes/No
g)	The model supports the creation of reusable templates in accordance with **clause 5.1.2.9**	Yes	*Yes/No
h)	Model updates shall be managed in accordance with **clause 5.1.3**	Yes	*Yes/No
i)	Creation and Maintenance of the Network Model shall be managed in accordance with **clause 5.1.4**	Yes	*Yes/No
j)	The Grid Operation system shall allow for a limited set of temporary changes to the electrical model in accordance with **clause 5.1.5**	Yes	*Yes/No
k)	Topology Analysis function shall provide analysis of the distribution network in accordance with **clause 5.1.6**.	Yes	*Yes/No
l)	The Grid Operation system shall provide a tool for the operator to trace the as-operated electrical connectivity of any selected connected electrical network facility in accordance with **clause 5.1.7**	Yes	*Yes/No

* Delete whichever is not applicable

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NAME (Block Capitals): _____ **Date:**

SIGNATURE: _____ _____

SECTION 10: ANNEXURE D - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION GRAPHICAL USER INTERFACE (GUI) REQUIREMENTS

RETURNABLE DOCUMENT 4

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
4	**GRAPHICAL USER INTERFACE (GUI)**		
a)	Operator Client application shall serve as the interface for operation and management of the network, access to databases and overview of network elements, operational analysis, create and manage switching plans and work requests in accordance with **clause 5.2.2.**	Yes	*Yes/No
b)	The Web Interface shall provide insight into the current state of distribution network through the availability of all distribution network views in accordance with **clause 5.2.3**	Yes	*Yes/No
c)	The Basic GUI functionality shall contain a set of features in accordance with **clause 5.2.4**	Yes	*Yes/No
d)	The Data Editor Client shall consist of several sub-modules, used for editing specific parts of the model in accordance with **clause 5.2.5**	Yes	*Yes/No
e)	Grid Operation Solution shall provide creation and editing of basic network elements as defined in **clause 5.2.6**	Yes	*Yes/No
f)	The grid operation solution shall contain an application that will be used for creating symbols that graphically represent elements in a distribution network in accordance with **clause 5.2.9.2**	Yes	*Yes/No
g)	The system shall enable the use of remote clients, running on a workstation outside the datacenter, in accordance with **clause 5.2.9.2**	Yes	*Yes/No
h)	Network views shall be an interactive graphical representation of the interconnected network model in accordance with **clause 5.2.9.2**	Yes	*Yes/No
i)	The system shall have the ability to generate auto-schematic single-line feeder diagrams in accordance with **clause 5.2.9.2**	Yes	*Yes/No
j)	Areas of Responsibility (AORs) shall provide separation of duties between users through regional division of assets in accordance with **clause 5.2.9.3**	Yes	*Yes/No

* Delete whichever is not applicable

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NAME (Block Capitals): _____ **Date:**

SIGNATURE: _____ _____

SECTION 10: ANNEXURE E - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION OUTAGE MANAGEMENT SYSTEM REQUIREMENTS

RETURNABLE DOCUMENT 5

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
5	**OUTAGE MANAGEMENT SYSTEM (OMS)**		
a)	Outage Management System (OMS) subsystem shall be available as a set of tools and analytical functions in accordance with **clause 6.**	Yes	*Yes/No
b)	Applications shall take into account active planned and unplanned outages in accordance with **clause 6.1.4**	Yes	*Yes/No
c)	Records of all outages shall be maintained, providing a central repository of distribution outage information to support historical analysis, the calculation of outage reliability indices, and current real-time operations in accordance with **clause 6.1.5**	Yes	*Yes/No
d)	After closure of the outage all data shall be stored in a database and available for reporting inclusive of Outage Reports and Outage Statistics as defined in **clause 6.1.6**	Yes	*Yes/No
e)	The OMS contains Functions and features as listed and defined in **clause 6.1.7.**	Yes	*Yes/No
f)	Incident management shall be defined by **clauses 6.2.1 to 6.2.21**	Yes	*Yes/No
g)	The system shall provide an overview of incidents in the form of a dashboard defined **by clause 6.3.**	Yes	*Yes/No
h)	Unlocated incidents shall be managed in accordance with **clause 6.6.**	Yes	*Yes/No
i)	Nested incidents shall be created and managed as per **clause 6.7.**	Yes	*Yes/No
j)	The OMS system shall include functionality to automatically calculate estimated time to restore (ETR) for customers based on estimation rules configured in the system defined **by clause 6.8**	Yes	*Yes/No
k)	The OMS system shall include Prediction Analysis functionality as defined in **clause 6.9.**	Yes	*Yes/No
l)	Customers shall be managed according to the **clauses defined in 6.10** Customer Management.	Yes	*Yes/No

* Delete whichever is not applicable

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NAME (Block Capitals): _____ **Date:**

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SECTION 10: Annexure E - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION OUTAGE MANAGEMENT SYSTEM REQUIREMENTS (continued)

RETURNABLE DOCUMENT 5 (continued)

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer (Select Yes or No)
5	**OUTAGE MANAGEMENT SYSTEM (OMS) (Continued)**		
m)	The OMS shall have a Trouble Call System that will be used by Customer Service Representative (CSR), Distribution Operators, Dispatchers, System Administrator, and by other authorized personnel to manually enter trouble calls as defined in **clause 6.11.**	Yes	*Yes/No
n)	The system shall provide means to manage crews in accordance with **clause 6.12** Crew Management.	Yes	*Yes/No
o)	The system shall offer functionality to use events from smart meters for various outage applications as defined in **clause 6.13.**	Yes	*Yes/No
p)	The Outage Management system shall provide access to data via a Web browser independent of additional software installation on the client machines and shall operate as defined in **clause 6.15**.	Yes	*Yes/No
q)	The system shall manage incidents in Web and provide Web applications that can be used by crew dispatchers, support dispatchers and corporate users with limited access to the system in accordance with **clause 6.16.**	Yes	*Yes/No
r)	The system shall provide Mobile Application in the form of a web-based software product which provides utility field personnel with tools and information that enables them to perform their daily duties related to Outage management in accordance with **clause 6.17.**	Yes	*Yes/No
s)	Storms shall be managed in accordance with **clause 6.18**.	Yes	*Yes/No
t)	The system shall have the ability to create damage assessment requests in order to support the outage restoration process in accordance with **clause 6.19.**	Yes	*Yes/No
u)	The system shall have the ability to edit incidents in accordance with **clause 6.20.**	Yes	*Yes/No
v)	The system shall have the ability to calculate performance indices as defined by IEEE 1366-2012 and NRS 048-6:2009 standards in accordance with **clause 6.21 and clause 10.3.2.**	Yes	*Yes/No

*** Delete whichever is not applicable**

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NAME (Block Capitals): _____ **Date:**

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SECTION 10: ANNEXURE F - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION LOAD SHEDDING and FLISR REQUIREMENTS
RETURNABLE DOCUMENT 6

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer
6	**Load Shedding Function**		
a)	The Load Shedding function shall support Fixed load shedding Rotational Load shedding Operational Modes as per **clause 7.2**	Yes	*Yes/No
b)	The system shall automatically generate a prioritised list of remotely controllable loads/feeders available for load shedding.	Yes	*Yes/No
c)	The function shall ensure non-discriminatory disconnection whilst balancing system stability and revenue loss.	Yes	*Yes/No
d)	The Load Shedding function shall provide a ranking criterion to rank and priorities consumer groups.	Yes	*Yes/No
e)	The Load Shedding function shall Alert the control operator of rotational intervals	Yes	*Yes/No
f)	The Load Shedding Function shall target a specific power (load) requirement as a percentage of total system load	Yes	*Yes/No
g)	The Load Shedding Function shall rotate load shedding across different consumer groups over defined time intervals.	Yes	*Yes/No
7	**Fault Location, Isolation, Restoration of Supply (FLISR)**		
7.1	The FLIRS shall avoid closing on a fault or operating when there are upstream issues. The logic shall conform to **clause 8.1** for safety and interlocking mechanism.	Yes	*Yes/No
7.2	The fault location and localisation shall conform to **clause 8.2** and **clause 8.3**	Yes	*Yes/No
7.3	The isolation and restoration shall conform to **clause 8.4 and 8.5**	Yes	*Yes/No
7.4	The system shall provide a configurable, profile-based FLISR in accordance with **clause 8**.	Yes	*Yes/No
7.5	The operator shall have the ability to abort FLIRS instantly in accordance with **clause 8.8**	Yes	*Yes/No
7.6	**Blocking**		
a)	The system shall provide hierarchical blocking capability (System, Region, Substation and feeder)	Yes	*Yes/No
b)	Blocking shall cascade down the hierarchy, preserve audit comments and integrated into OMS.	Yes	*Yes/No
c)	The system shall have a clear graphical indication of fault location, isolated sections, and restoration options and excluded devices.	Yes	*Yes/No
d)	The system shall have full transparency of switching sequences, decision logic, execution reports and alarms.	Yes	*Yes/No

* Delete whichever is not applicable

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SECTION 10: ANNEXURE G - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION SWITCHING MANAGEMENT AND OPERATIONAL HISTORAIN REQUIREMENTS

RETURNABLE DOCUMENT 7

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer
8	**Switching Management System**		
a	The module shall include a fully integrated switching management module supporting work and safety governance, switching planning, scheduling and clash detection and validation engine as defined in **clauses 9.1 to 9.4 of the technical specification.**	Yes	*Yes/No
b	The validation engine shall verify topology validation, protection coordination, tagging logic, SCADA constraints in accordance with **clause 9.12**	Yes	*Yes/No
9	**Operational Historian**		
9.1	The system shall provide a centralized historian platform enabling data storage, advanced analysis tools and reporting as per **clause 10.2**	Yes	*Yes/No
9.2	The historian shall provide data access and storage of SCADA data, OMS events, switching actions as per **clause 10.3**	Yes	*Yes/No
9.3	The historian shall have the ability to export information to external systems in accordance with **clause 10.2.7**	Yes	*Yes/No
9.4	The historian shall have the ability manage the data lifecycle (archiving, de-archiving and database cleanup) in accordance with **clause 10.5**	Yes	*Yes/No

* Delete whichever is not applicable

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SECTION 10: ANNEXURE H - TECHNICAL REQUIREMENT SCHEDULE FOR THE GRID OPERATION DISPATCHER TRAINING SIMULATOR (DTS)REQUIREMENTS

RETURNABLE DOCUMENT 8

(This document shall be completed, signed and returned with bid documents of which it forms part.)

Ref. No.	Technical Details	Energy Management Directorate's Requirement	Tenderer's Offer
10	**Dispatcher Training Simulator (DTS)**		
a)	The DTS shall be a fully segregated subsystem of the Grid Operation System that replicates the production environment and enables real-time, scenario-based operator training without impacting the live network operations in accordance with **clause 11.1.1**	Yes	*Yes/No
b)	The DTS shall provide a realistic simulation of the network and human interaction in accordance with **clause 11.1.4**	Yes	*Yes/No
c)	The DTS shall use production models, historian data, and real interfaces	Yes	*Yes/No
d)	The DTS shall support multi user training (Students + instructor roles) in accordance with **clauses 11.3 and 11.4**	Yes	*Yes/No
e)	The DTS shall enable scenario-based training, including creation, execution, playback and evaluation. in accordance with **clauses 11.4**	Yes	*Yes/No
f)	The DTS shall provide a full replica of production user interface, SCADA, OMS and DMS functionality in accordance with **clauses 11.2.6**	Yes	*Yes/No
g)	The DTS Shall allow simulation of electrical network behaviour, SCADA, AMI, GPS (crew and vehicle location), Field operation and crew movement in accordance with **clauses 11.10.3**	Yes	*Yes/No
h)	The DTS shall support what if analysis as per **clause 11.2.6**	Yes	*Yes/No
i)	The scenario management shall provide the ability to create, edit, save, merger and replay scenarios in accordance with **clause 11.7.1 and 11.7.2**	Yes	*Yes/No
j)	Scenario inputs shall include Manual Events, Historical data, Random /automated generation in accordance with **clause 11.7.5**	Yes	*Yes/No
k)	Simulation of Network Events: Faults (transient/permanent), Switching operations, loss of communication/control/customer calls and AMI events, Protection and automation responses in accordance with **clause 11.7.5**	Yes	*Yes/No

* Delete whichever is not applicable

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NAME (Block Capitals): _____ **Date:**

SIGNATURE: _____ _____

SECTION 10: ANNEXURE I - EVALUATION CRITERIA, USING FUNCTIONALITY APPROACH

The procedure for evaluation of responsive Tender Offers will be in accordance with the eThekwini Municipality's current SCM Policy, the Preferential Procurement Policy Framework Act No 5 of 2000, and the Preferential Procurement Policy Framework Act Regulations (January 2022).

The procedure for the evaluation of responsive tenders is Price and Preference, with Functionality.

Price and Preference

- The **80/20** preference points system will be used where the financial value (incl. VAT) of one or more responsive tender offers have a value that equals or is less than R 50,000,000. The **Price Points** formula and allocated **Preference Points** will be according to the above specified PPPFA Regulations.

- The **90/10** preference points system will be used where the financial value (incl. VAT) of all responsive tenders received have a value in excess of R 50,000,000. The **Price Points** formula and allocated **Preference Points** will be according to the above specified PPPFA Regulations.

Functionality

- The **minimum** number of evaluation points for Functionality (Stage 1) is **30.**

- The Functionality Criteria / Sub-Criteria and maximum score in respect of each of the Criteria are as follows:

Functionality criteria	**Sub criteria**	**Points**	**Evaluation Schedule(s)**
Experience of Tenderer	Experience of service provider in executing work of similar scope	20	
Experience of Key Resources in executing work of similar nature	Project Manager	5	
	Cyber security specialist	5	
	SCADA / Telecontrol / IEC 61850 Engineers	5	
	Data Migration lead	5	
	Network Model Specialist	5	
	OMS Solution Architect	5	
	CIM / Data Integration Specialist	5	
	Power System Application Engineer	5	
Maximum possible score for Functionality (M_s)		60	

- Each Criteria will be assessed in terms of five indicators – no response, poor, satisfactory, good and very good. Scores of 0, 40, 70, 90 or 100 will be allocated to no response, poor, satisfactory, good and very good, respectively.

The evaluation criteria shall be 2 stages as per the breakdown below:

FUNCTIONALITY	MAXIMUM SCORE
STAGE 1	
1. Key Personnel - Expertise and Experience	**40**
The following personnel will be required: Do the key personnel have relevant and sufficient experience and expertise (3 years' relevant experience or more; indicated through attachment of a proven track record of similar projects)? ○ **Nil** – No submission (score 0%) ○ **Poor (score 40%)** – The team has limited experience in projects of similar nature (less than 3 years' relevant experience) ○ **Satisfactory (score 70%)** – The tenderer has relevant experience in projects of similar nature (4 - 6 years relevant experience) ○ **Good (score 90%)** – The tenderer has good experience in projects of similar nature (between 7 – 10 years relevant experience). ○ **Very good (score 100%)** – The tenderer has extensive experience in projects of similar nature (Greater than 10 years relevant experience)	
2. Company/Service Provider - Experience	**20**
Do the key personnel have relevant and sufficient experience and expertise (5 years' relevant experience or more; indicated through attachment of a proven track record of similar projects)? ○ **Nil** – No submission (score 0%) ○ **Poor (score 40%)** – The team has limited experience in projects of similar nature (less than 3 Projects of a similar nature) ○ **Satisfactory (score 70%)** – The tenderer has relevant experience in projects of similar nature (3 to 5 Projects of a similar nature) ○ **Good (score 90%)** – The tenderer has good experience in projects of similar nature (between 6 – 8 projects of a similar nature). ○ **Very good (score 100%)** – The tenderer has extensive experience in projects of similar nature (9 or more projects of a similar nature).	
TOTAL	**60**
STAGE 2	
Price: overall budget of the project	90
BEE: empowerment status	10
GRAND TOTAL	**100**

SECTION 10: ANNEXURE J - TENDERER'S EXPERIENCE

The experience of the tendering entity or joint venture partners in the case of an unincorporated joint venture or consortium, as opposed to the key staff members / experts, in projects of similar nature over the last ten (10) years will be evaluated. Tenderers must provide details of their knowledge of the local area and previous experience with key local stakeholders. Tenderers should very briefly describe their experience in this regard and attach this to this schedule. Proof of participation / case studies and contact details of clients of the relevant projects must also be provided. The description should be put in tabular form with the following headings:

Employer, contact person and telephone number, (where available)	**Project Title**	**Detail of work undertaken, nature of work, and value**	**Date undertaken and completed**

The scoring of the tenderer's experience will be as follows:

Level	Score	Criterion: Tenderer's Experience	Tender Offer
0	0	No Submission or Submission of no substance / irrelevant information provided. (no evidence of experience submitted)	
1	5	To have successfully completed 1 to 3 projects of a similar scope within the past 10 years. (Client Reference letters to be provided for each of the projects listed).	
2	10	To have successfully completed 4 to 6 projects of a similar scope within the past 10 years. (Client Reference letters to be provided for each of the projects listed).	
3	15	To have successfully completed 7 to 10 projects of a similar scope within the past 10 years. (Client Reference letters to be provided for each of the projects listed).	
4	20	To have successfully completed 10+ projects of a similar scope within the past 10 years. (Client Reference letters to be provided for each of the projects listed).	
Note 1: Maximum points earned for Tenderer's Experience shall **Total 20 points.**			

SECTION 10: ANNEXURE K - EXPERIENCE OF KEY STAFF

The experience of assigned staff member in relation to the scope of work will be evaluated from three different points of view:

1) General experience, level of education and training and positions held of each operational area team leader.

2) The skills and experience of the assigned staff in the specific operational areas. Linked to the scope of work.

3) The key staff members' / experts' knowledge of issues which the tenderer considers pertinent to events eg. local conditions, legislation, techniques etc.

CVs of the team director, and team leaders of **not more than 2 pages each** should be attached to this schedule: (define which CV's are required)

Each CV should be structured under the following headings:

Personal particulars	Qualifications	Skills	Name of current employer and position in enterprise	Outline of recent assignments / experience that has a bearing on the scope of work

The scoring of the experience of key staff will be as follows (for each of the indicated (required) key staff):

Score	Prompts for Judgement
(score 0)	No response/ no documents submitted.
Poor (score 40)	Key staff have less than the minimum levels of relevant qualification/training experience and/or post professional registration. (Number of years of experience and qualifications are **less than** the minimum specified in the schedule below)
Satisfactory (score 70)	Key staff have reasonable levels of relevant qualification/training experience and/or post professional registration. (Number of years of experience and qualifications are at least equal to the preferred specified in the schedule below)
Good (score 90)	Key staff have extensive levels of relevant qualification/training experience and/or general post professional registration. (Number of years of experience and qualifications are at least equal to the preferred specified in the schedule below)
Very good (score 100)	Key staff have outstanding levels of relevant qualification/training experience and/or general post professional registration. (Number of years of experience and qualifications are at least equal to the preferred specified in the schedule below)

SECTION 10: ANNEXURE J - EXPERIENCE OF KEY STAFF (continued)

Experience of Key Resources in executing work of similar nature								
Job Title	**Minimum Qualification Required**	**Professional Registration Required**	**Number of Years' Relevant Experience on projects of a similar nature**				**Total %**	**Total points**
			Level 0 0 %	Level 1 40 %	Level 2 70 %	Level 3 90 %	Level 4 100 %	**Max 5 Per resource**
Project Manager	PMP	PMP	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
Cyber security specialist	Certificate NQF level 5	CISM/CISSP/CCSP/CEH	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
SCADA / Telecontrol Engineers	BSc Eng or BEng or BTech	Pr. Eng, or Pr Tech Eng ECSA or equivalent	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
Data Migration lead Engineer	NQF Level 6 Relevant degree/ diploma	Pr. Eng, or Pr Tech Eng ECSA or equivalent	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
Network Model Specialist	Relevant Diploma/B Eng/B Tech/BSc Eng	GIS Certification Institute (GISP) / Esri technical certifications or similar	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
OMS Solution Architects	BSc Eng or BEng or BTech	Pr. Eng, or Pr Tech Eng ECSA or equivalent	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
CIM / Data Integration Specialists	BSc Eng or BEng or BTech	Pr. Eng, or Pr Tech Eng	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
Power System Application Engineers	BSc Eng or BEng or BTech	Pr. Eng, or Pr Tech Eng ECSA or equivalent	No Submission	≤ 3	> 3 ≤ 7	> 7 ≤ 10	> 10		
Total Points									
Note 1: "experience" implies experience on projects of a similar nature with respect to the Scope. Note 2: "accredited degree / diploma" implies a minimum 3 yr qualification within the built environment, from a registered University or Institute of Technology. Note 3: Maximum points earned for Key Resources shall Total 40 points.								

ANNEXURE L: MANDATORY CRITERIA

The tenderers will be checked if they meet the mandatory requirements. Any tenderer that does not meet any of the mandatory requirement will be deemed non-responsive.

All responsive tender offers will then be evaluated in accordance with eThekwini Municipality's current SCM Policy, the Preferential Procurement Policy Framework Act (5 of 2000), and the Preferential Procurement Policy Framework Act Regulations (January 2022) using an 90/10 preference point system.

MANDATORY REQUIREMENTS

1. The tenderer must be an accredited service provider of **The Grid Operation Solution** offered and must attach an accreditation letter to this effect.

2. The bidder's key staff resources to be assigned to this project must possess a minimum **3 years' relevant experience** as per the Key Personnel required and their CVs confirming their experience must be attached, in accordance with Section 10:Annexure K.

3. The bidder's must have successfully completed a minimum of **3 projects** in the past 10 years in order to be eligible to manage the proposed Grid operation solution in accordance with Section 10: Annexure J.

4. The bidder must submit as part of the bid, the technical datasheet for the equipment quoted for.