RFI – REQUEST FOR INFORMATION

SOLUTIONS FOR

SUBSTATION DESIGN

RFI NUMBER 2000650785
0. ADMINISTRATION

0.1 General

Israel Electric Corporation (IEC) is interested in information about solutions for substation design.

The solution should be standard, commercial, off-the-shelf solution, to meet general standardization requirements customary in the field of computerization in Israel and worldwide, and the requirements detailed henceforth.

This document is a "Request for Information" (RFI), describing the contents of the desired solution.

Some, or all, the information received, may be used by IEC, to prepare the documentation of the Request for Proposals, for the supply and implementation of the solution by bidding or otherwise and/or to prepare a list of qualified suppliers, who may be addressed in that regard.

IEC invites all interested parties to submit a written reply to this RFI.

0.2 Definitions

0.2.1 **IEC**: Israel Electric Corporation Ltd.

0.2.2 **ISC**: Information Systems & Communications Division (of IEC).

0.2.3 **The Finance and Economy Department**: The department which handles ISC contracts and agreements.

0.2.4 **The RFI**: this document – the "Request for Information" of the desired solution in question.

The RFI may also be referred as **this document** and **this RFI**.

0.2.5 **The Information Provider or the Supplier**: The body that submits a response to the RFI, and potentially may be the solution provider.
0.2.6 The Solution: The solution and its implementation in IEC according to the requirements described in the RFI, that is described by the information provider in his response to the RFI.

0.3 Administration

0.3.1 Questions and requests for clarifications

Questions related to this RFI should be submitted in writing to IEC representative:

a. Mr. Yaron Huberman, the Information Systems for Engineering Projects Department, E-mail yaronh@iec.co.il, Fax 972-4 – 813943.

b. Miss Chen Daniel, Finance and Economy Department, Phone no. 972-4-8186228, E-mail chen_d@iec.co.il.

In addition to the questions, the questioner should provide a fax number or email address to which the reply should be sent.

0.3.2 Submitting of the reply

The reply will be submitted in a sealed envelope, in 2 copies stating the RFI number 2000650785, and the receiver details: Miss Chen Daniel, the Finance and Economy Department representative.

The address for submission:
THE ISRAEL ELECTRIC CORPORATION, LTD.
MAIN OFFICE BUILDING,
1 NATIV HAOR ST.
HAIFA (southern entrance)
ISRAEL.
BID BOX NO. 8 - GROUND FLOOR, ROOM 009.

Alternatively or additionally the reply may be sent to: fax no. +972-4-8184809, stating the following at the first page:
- RFI number: 2000650785
receiver details described above

After sending the reply by fax, please make sure that it had received in its destination by sending an email to the address chen_d@iec.co.il.

**Deadline for submission of the reply to the RFI: September 5, on 15:00.**

The response must include contact person, details of the information provider representative, such as name, title, and email address. This will enable IEC to send questions and requests for clarifications to the Information provider, as needed.

0.3.3. **Extending the date for submitting the replies**

IEC may, at its discretion, extend the final date for submitting the replies at any time prior to the final date defined for submission. IEC will not be obliged to extend the date for submitting the replies due to any request for whatever reason. In case of extension of the date for submitting the replies, a notice will be sent to all parties who informed IEC about their intentions to answer the RFI documents. The new date will be also published in the press and on the IEC website.

0.3.4 **Information submission**

0.3.4.1 The reply document to the RFI should be as follows:

- The format should be identical to the RFI format.

  For example:
  
  Section 2.1 in the reply document will contain the answer to section 2.1 in the RFI, section 2.2 in the reply document will contain the answer to section 2.2 in the RFI, section 2.2.1 in the reply document will contain the answer to section 2.2.1 in the RFI, etc.
The RFI document is based on a formal format that defines the numbers, headlines and contents of the characters, sections and subsections. Therefore, the numbers are not necessarily sequential, and their order should not be changed.

- Sections which the information provider chooses not to answer should contain the text "no answer" in the reply document.
- The reply to sections and subsections may be extended by reference to additional attached documents.
- Documents with extended information and charts relating to matter not explicitly requested in the RFI should be attached separately, as appendices with additional materials.
- User Guides and Manuals may not be submitted as part of the reply to the RFI.

0.3.4.2 Other relevant details may be submitted later if necessary, with an indication that these are additions and changes to answers that have already been submitted.

0.3.4.3 The reply document must be only in English or in Hebrew.

0.3.4 **General conditions**

- This request for information does not establish any commercial/business relationship between IEC and the information provider.
- This document will not form any limitation or condition, which may be applied to other requests for information and requests for proposals, on behalf of IEC.
0.4 THE RFI

This Request for Information includes:

a. Administration chapter - chapter 0.
c. Commercial chapter - chapter 5.

0.5 RFI ownership

0.5.1 This RFI is the Intellectual Property of IEC, to be transferred to the information provider only for the purpose of receiving the reply document for the requested information.

This document should not be used in any way other than preparing the reply document for IEC.

0.5.2 IEC is fully committed to the required confidentiality regarding all the contents of the documents which will be accepted from the information provider as the reply to the RFI.

IEC will be allowed to use the reply documents and its content in any way related to the RFI.

IEC is committed not to use the reply documents for any purpose other than this RFI and its implementation.

0.6 Legal status of the RFI and additional general clarifications

a. This document is a part of preliminary proceedings, investigating the possibility of purchasing the solution described in the following chapters and its implementing. This RFI may or may not be followed by a separate bidding or other contractual process. Any further process related to the RFI is solely dependent on the discretion of IEC.

b. IEC is not obliged to publish a tender and/or purchase the solution, and/or any other future procedure related to the RFI.
c. IEC is not obliged to implement in future processes (should such a process exist and should IEC choose to publish this process) the technological information/clarifications provided by the Information provider/s in the replies to the RFI.

d. Nothing in this RFI or in the Information Provider’s response to this RFI shall create any obligation/s on part of the Information Provider, or the IEC, towards each other, in any respect.

e. This invitation and/or any information or data submitted in response and/or any communication exchanged thereafter, will not bind the supplier and/or IEC in any manner or form.

f. To the extent that any prices or quotes are requested and/or submitted, such prices/quotes shall be budget prices/quotes, having no binding effect whatsoever.

g. Furthermore, any information provided in connection with this inquiry shall be held confidential.

h. The information/data submitted by the supplier, or any part thereof, may be used by the IEC, to compose a list of qualified suppliers and/or a list of technical requirements/standards. Qualified suppliers may be subsequently invited to participate in future biddings or other processes; the issuance, scope and terms of which are subject to IEC’s exclusive discretion. The mere response to this invitation does not, in itself, assure any supplier of inclusion in IEC’s list of suppliers.

IEC wishes to thank you for your anticipated participation and cooperation in the successful completion of this RFI initiative.
1. Objectives

1.0. (I) General - Highlights

The Engineering Division of the Israel Electric Corporation Ltd. (hereinafter "The Electric Company" or "The Company" or "IEC") deals with the design of all types of Substations.

IEC is interested getting information on off-the-shelf system or systems for Substation design which supports 3-D model for Electro-Mechanical & Civil Disciplines and an Engineering System for Electrical Discipline. Partial solutions (3-D model system or Electrical Engineering system) are welcome as well.

1.1. Client

1.1.0. The Client / Principal User

The principal users are personnel from the Engineering Division – Substation Sector and Civil Sector.

The main user groups are as follows:

- Civil Designers in the Engineering Division
- Electro- Mechanical Designers in the Engineering Division
- Electrical Designers in the Engineering Division
2. Implementation (System essence)

2.0. Highlights:

Implementation of an off-the-shelf solution for Substation design which supports Electro-Mechanical, Civil and Electrical design.

The solution will be based on implementation of an off-the-shelf system or systems, with preparation for work at IEC (Israel Electric Corporation).

2.1. General Characteristics

2.1.1 Term Definitions

2.1.1.1 System
Software application for substation design.

2.1.1.2 The Solution
One or more systems that together meet the requirements.

2.1.1.3 Substation / Site / Station
The terms Substation, Site & Station are interchangeable.

2.1.1.4 Project / Version / Project Version
Particular work stage of a new or existing substation. Project, version & project version are interchangeable.

2.1.1.5 Engineering Item
An entity used in the substation, such as a transformer, breaker, equipment, cable.

2.1.1.6 Intelligent Text
A text field for which its value is affected by a property in the database. When creating an object in the system (diagram or engineering component) its value will be taken from the database by default.
For Example: when placing a relay in a panel the relay will inherit the panel number attribute.
2.1.1.7 IEC

Israel Electric Corporation, unless otherwise stated.

2.2. Internal Delimitations

2.2.0 General Description of the Solution

The requested solution will be an all inclusive off-the-shelf solution for Electro-Mechanical, Civil and Electrical design of substations.

The solution will include the functions described in the following sections and will be based on:

2.2.0.1 Integrated 3-D model for Electro-Mechanical & Civil Design.

2.2.0.2 2-D system for Electrical Design with interface with the 3-D model supporting:

2.2.0.2.1 Export of cable list and panel list from the 2-D system for Electrical to the 3-D model.

2.2.0.2.2 Export of distances between panels from the 3-D model to 2-D system for Electrical Design.

2.2.0.3 Specific systems for Electro-Mechanical Design including interfaces to the 3-D model for features not covered by the integrated 3-D model.

2.2.0.4 Specific systems for Civil Design including interfaces to the 3-D model for features not covered by the integrated 3-D model.

2.2.0.5 Each design discipline (Electro-Mechanical, Civil and Electrical) will be based on information created in the other disciplines.

2.2.1 General Requirements for all Disciplines of Design

2.2.1.1 The Drawing Sheet

2.2.1.1.1 The drawing sheet frames templates can be independently defined for each engineering project.
2.2.1.2 3-D Physical Design

2.2.1.2.1 The solution will include the ability to create an integrated 3-D Model of Electro-Mechanical & Civil Design.

2.2.1.2.2 Drawings will be generated based on the 3-D model.

2.2.1.2.3 The Solution will support 3D visualizations (walk through).

2.2.1.2.4 The Solution will support clash detection as following:

   2.2.1.2.4.1 Support continuous clash detection – automatically detect clashing during the building/updating process of the 3-D model.

   2.2.1.2.4.2 Support on-demand clash detection – detect clashing in the 3-D model as per user request.

   2.2.1.2.4.3 Support user ability to set clash detection parameters for overlapping and clearance.

2.2.1.2.5 The Drawing including the Graphical Report will support annotations allowing IEC users to add necessary tolerances, symbols, notes, and tables.

2.2.1.3 Standards, Symbols & Catalogs

2.2.1.3.1 The solution will include the modifications and components required for working with:


   - Euro & AISC Steel structure for Civil Design
• Israeli Standards: 466 for Concrete; 1225 for Steel; 1226 for Concrete Structure Diagrams; 414 for Wind; 413 for Earthquakes; 412 for Loads (Stress).
• IEEE Electro-Mechanical Design.

2.2.1.3.2 Possibility of supporting other standard.

2.2.1.3.3 Item catalog will be modifiable (adding and updating an item include adding user defined attributes).

2.2.1.3.4 Require ability to prepare, edit and add graphical representation to a catalog item (symbol).

2.2.1.3.5 Creating Diagrams/3-D model may be based on item catalogs.

2.2.1.4 Naming convention of engineering items

2.2.1.4.1 IEC will have the ability to customize/configure the solution such that the naming convention of engineering items will include Intelligent Text, according to a template defined by IEC. An individual template can be defined for each Substation.

2.2.1.4.2 IEC will have the ability to customize/configure the solution such that parts of the template for the naming convention of engineering items will be based on a predefined list of values. An individual template can be defined for each Substation.

2.2.1.5 Design Rules

2.2.1.5.1 The design rules can be customized/configured by IEC.

2.2.1.5.2 Engineering items will be built according to pre-defined design rules.

2.2.1.6 Representation of Engineering Changes (Alterations) on a Document with Respect to the Previous Revision.
The solution will support graphical representation of the engineering changes in a document with respect to the previous revision of the document by indicating the revision number in which the engineering changes (alterations) were made.

2.2.1.7 Support of Real-Time Parallel Work
New engineering objects or updates to an existing object, will be available immediately to all designers (Electro-Mechanical, Civil, Electrical) without necessitating any user initiated action whatsoever while working on the same system.

2.2.1.8 Query, Report and Data Acquisition
2.2.1.8.1 Building and designing capability of reports by IEC.
2.2.1.8.2 The solution will facilitate preparation of Bills of Material (B.O.M).
2.2.1.8.3 User ability to export & import reports to an EXCEL file.
2.2.1.8.4 User ability to export reports to a PDF file.
2.2.1.8.5 User ability to export Diagrams to DWG format file.

2.2.1.9 Raster Images
2.2.1.9.1 Ability to integrate raster images.
2.2.1.9.2 Ability to assist in converting a raster image to a 2-D vector file.

2.2.1.10 Converting 2-D Vector File to 3-D Model
Ability to assist in converting a 2-D vector file to a 3-D Model.

2.2.2 Requirements for Electro-Mechanical Design
2.2.2.1 3-D modeling
2.2.2.1.1 Creation of 3-D Model Pipe Design.
2.2.2.1.2 Creation of 3-D Model Pipe Support.
2.2.2.1.3 Creation of 3-D Model Cables, manholes & ducts.
2.2.2.1.4 Creation of 3-D Model Road.
2.2.2.1.5 Creation of 3-D Model Crane Requirements Design.
2.2.2.1.6 Creation of 3-D Model Grounding Grid Design.
2.2.2.1.7 Creation of 3-D Model Equipment.
2.2.2.1.8 Creation of 3-D Model Equipment Support.
2.2.2.1.9 Creation of 3-D Model Buildings
2.2.2.1.10 Creation of 3-D Model Cable Routing.
2.2.2.1.11 Creation of 3-D Model Cable Trays.
2.2.2.1.12 Creation of 3-D Model Lightning Protection Design.
2.2.2.1.13 Creation of 3-D Model Indoor and Outdoor Lighting Design.
2.2.2.1.14 Creation of 3-D Model air-conditioning & ventilation.
2.2.2.1.15 Creation of 3-D Model Fire-Protection.

2.2.2.2 Graphical Report from the 3-D model
2.2.2.2.1 Isometric drawing for piping from the 3-D model.
2.2.2.2.2 Facilitate inclusion of B.O.M. in the drawing as table.

2.2.2.3 Calculation
2.2.2.3.1 Fire-Protection.
2.2.2.3.2 Calculation of electromagnetic effect for rigid and flexible conductors based on standard IEC (International Electro-technical Commission) 865.
2.2.2.3.3 Wire Sag Algorithm Analysis.

2.2.3 Requirements for Civil Design:
The solution will support the following areas:

2.2.3.1 Architectural

2.2.3.1.1 3-D modeling
2.2.3.1.1.1 Creating of 3-D modeling Architectural.
2.2.3.1.1.2 Supporting Green building - Tools for calculating the impact on the surroundings (Shade, Thermal Calculations, Lighting)
2.2.3.1.1.3 Supporting Sustainable Design.
2.2.3.1.2 Graphical Report from the 3-D model

2.2.3.1.2.1 Generating Architectural detail components (Door/Window Frames List) from the 3-D model.

2.2.3.1.2.2 Generating 2-D sections and elevations from the 3-D model.

2.2.3.2 Infrastructure & General Arrangement & Landscape planning

2.2.3.2.1 Site Development.

2.2.3.2.2 Road Design.

2.2.3.2.3 Site Development & Road Design will be based on survey data that will be imported from either REG or DIS file format.

2.2.3.2.4 Generating graphical report showing where to dig and where to fill earth.

2.2.3.2.5 Generating quantity Earth Works Report.

2.2.3.2.6 Irrigation and drainage system design.

2.2.3.3 Concrete

2.2.3.3.1 3-D modeling

2.2.3.3.1.1 Creating of 3-D modeling concrete.

2.2.3.3.1.2 Creating the 3-D modeling based on the 3-D architecture modeling.

2.2.3.3.1.3 Designing foundations based on size parameters.

2.2.3.3.1.4 Concrete structure design based on size parameters.

2.2.3.3.2 Calculation

2.2.3.3.2.1 Performing calculations for Concrete structure (such as dimensions, finding the center of gravity, tables, summary of total areas of plates, Gross Weight, Materials List).
2.2.3.3.3 Graphical Report from the 3-D model

2.2.3.3.3.1 Generating 2-D Concrete detail components from the 3-D model.

2.2.3.3.3.2 Generating 2-D sections and elevations from the 3-D model.

2.2.3.4 Steel structure

2.2.3.4.1 3-D modeling.

2.2.3.4.1.1 Creating 3-D modeling Steel structure.

2.2.3.4.1.2 Supporting detail design 3-d Model including design of connection element.

2.2.3.4.2 Graphical Report from the 3-D model

2.2.3.4.2.1 Generating 2-D Steel detail components from the 3-D model

2.2.3.4.2.2 Generating 2-D sections and elevations from the 3-D model.

2.2.4 Requirements for Electrical Design

2.2.4.1 Managing Electrical Items

2.2.4.1.1 The solution will include data for engineering items such as: Medium and Low voltage equipment; Panels; Instruments, Relays; Terminals; Terminal Blocks; Connection Boxes; Cables and Wires.

2.2.4.1.2 The solution will facilitate preparation of data sheets for electrical equipment.

2.2.4.1.3 Electrical Diagrams

2.2.4.1.3.1 Creating Schematic diagram

The diagram will depict components and their connections by wires.

2.2.4.1.3.2 Creating Panel layout

The Layout will represent the physical layout of devices in panels.
2.2.4.1.3.3 Creating Connection diagram

This diagram, also known as a wiring diagram, shows the physical - internal and external - connections of devices and terminals within and between panels. Wire groups (cables) are depicted as well as their common attributes. The connection diagram shall support project versioning with special symbology to differentiate between new, existing, and deleted devices and wiring connections. The connection diagram of a panel typically fills an A0 size drawing.

2.2.4.1.4 Ability to Produce the following reports:

2.2.4.1.4.1 Device Wiring List (In IEC it is called Mahgen)
2.2.4.1.4.2 Terminal Block Wiring List (In IEC it is called Sargen)
2.2.4.1.4.3 Cable List
2.2.4.1.4.4 Cable List by Panel
2.2.4.1.4.5 Cable Wiring by Panel
2.2.4.1.4.6 Panel List

2.2.4.2 Creating Substation Version

The solution will facilitate creating a new Substation version of an existing Substation based on the (alpha-numeric & graphical) information from an earlier substation version that is stored in the solution.

2.2.4.3 Create new Substation based on existing Substation

The solution will facilitate creating a new Substation/Project based on the (alpha-numeric & graphical) information from an existing Substation/Project that is stored in the solution.

2.2.4.4 Navigation Between Documents
A list of documents, created in the system, attached to an engineering item, in any part of the system, will be accessible from the engineering item, including opening a document selected from the list.

2.2.4.5 **Cable Length**

Creating cable reports as follows:

- Will include a list of all unique pairs of interconnected panels in a Substation.
- The list will be used as a user interface for updating a numerical distance value for each unique pair of interconnected panels.
- The length property for each cable between the respective pairs of interconnected panels will be updated automatically based on this list.

2.2.4.6 **Building Diagram based on hierarchal tree of objects**

Diagrams can be prepared based on objects pre-defined in a hierarchal tree of objects.

2.2.4.7 **Building tree of objects**

Design in the electrical discipline can be performed by creating engineering items in a diagram causing the tree of objects to be populated accordingly with engineering items created in the diagram.

2.2.4.8 **Connections Between Electrical Diagrams**

2.2.4.8.1 **Connection Between, Schematic Diagrams, Connection Diagrams and Panel Layout,**

The solution will facilitate transition of electrical circuits between electrical diagrams, of the same type, supported by the solution; including presenting the connection between the diagrams for said circuits and indication of the corresponding diagram.
2.2.5 Importing / Converting Data from Existing CAD Systems

In addition to the off-the-shelf system/s, capability will be provided for importing data from existing projects based on existing systems’ design drawings in DWG or Medusa software file format (structured drawing) and Alpha-Numeric data.
3. Additional Requirements

3.1. Configuration Management

The solutions will facilitate work with an external configuration management system.

3.2. Method of Information Management

All the engineering data (the item, its properties and the documents) will be part of the off-the-shelf solution for each system.

4. Interfaces

4.1. Steel Structure

Ability to import a model from analyzes software such as Stad-pro.

4.2. Concrete

Ability to import a model from analyzes software such as Strap.
5. **COSTS AND PRICES**

The reply to this chapter should include information about costs and prices associated with purchasing the required solution components and its implementing.

This information will be used to estimate the costs involved in the project and to evaluate the required budget.

The prices should refer to the current price list/estimations and future options, which may be realized after the initial basic purchase.

**All prices and costs should be noted in US dollars or in Euro.**

5.1 Solution components price list

The reply to this section should provide detailed basic prices/price list for all the solution components, preferably according to the following table:

<table>
<thead>
<tr>
<th>License type</th>
<th>License price</th>
<th>comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-D model for Electro-Mechanical &amp; Civil Disciplines</td>
<td></td>
<td></td>
</tr>
<tr>
<td>an Engineering System for Electrical Discipline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other licenses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2 Maintenance and support services prices

The table below should contain basic period price lists for annual maintenance and support services.

The prices should be presented with respect to the number of licenses purchased / software prices, and / or any other parameters considered in the calculation method of the prices.

<table>
<thead>
<tr>
<th>License type</th>
<th>Calculation method with respect to the purchase price and/or other relevant parameters</th>
<th>Annual maintenance price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-D model for Electro-Mechanical &amp; Civil Disciplines</td>
<td></td>
<td></td>
</tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other licenses</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The reply to this section should also include a similar table or any other way for describing future support periods' prices for maintenance and support services.

5.3 Other costs

The reply to this section should include any other payments for the software provider with respect to the solution described in this document and not mentioned before in this chapter.

For example: implementation and assimilation, travel and accommodations costs, if not included in other payments/price list.