



To:

All interested bidders

Reference is made to the tender N° 02/G/ICB/2022-2023/RAC for supply, installation and commissioning of diesel generators and digital voltage regulator;

Following the request for clarifications raised by some of prospective Bidders, Rwanda Airports Company would like to provide the following clarifications for your consideration.

N°	Clarification requested	Response
	LOT 1. SUPPLY, INSTALLATION AND COMMISSIONING OF DIESEL GENERATOR.	
1	Please confirm that the Automatic Transfer Switch (ATS) is no longer a requirement as part of the Generator? Page 51.	No inbuilt automatic transfer switch is required, only the output circuit breaker to protect the machine. Otherwise, each generator must use its changeover switch in accordance with item A4 (page 59).
2.	What communication do you need the Generator to have in order to send Data to the SCADA System? Page 58.	Depending on the generator's type and manufacturer, generators may have different communication protocol to send data to the SCADA. We do not oblige on the type or brand of equipment to be used, as long as the chosen protocol meets the requirement, which is to provide a set of information to the PLC (existing type of PLC: M 340 of Schneider) and then to the HMI. The information to be displayed is not limited to status, alarms and others as indicated on page 58. For the existing system architecture, the Modbus TCP/IP protocol is used.
3.	Share the Schematic Drawings from the two Subject Generators to the Changeover panel.	Refer to the SD001 drawing on the attachment
4.	Share the Schematic and Shop Drawings of the LV Mains Board	Refer to the SD001 drawing on the attachment

	<p>LOT 2. SUPPLY, INSTALLATION AND COMMISSIONING OF DIGITAL VOLTAGE</p>	
5.	<p>In the technical specifications provided, you specifically requested for IGBT based voltage stabilizers.</p> <p>IGBT based voltage stabilizers are power electronic devices, which makes them more sensitive to disturbances such as harmonics, surges, spikes and noises which have high amplitudes and frequency. The above-mentioned disturbances damage heavily the power conversion part of the static stabilizers (IGBT), increasing the necessity for replacement hence the increase in operating cost (OPEX), which is not the case for servo-controlled stabilizers, which are quite robust.</p> <p>Due to the power quality issues suffered by our region in goes beyond simple voltage instability and damage heavily power electronic components it is strongly advisable not to go for static stabilizers (IGBT)</p>	Refer to the response below (AVR revised specifications)



6.	Share the NEW DVR Specs as suggested in the Site Visit.	<p>There are not many changes regarding the technical specifications but the type of unit to be supplied. In the initial tender, we wanted IGBT based voltage stabilizers, which seem to be more electronic and impact its performance when it is installed in unstable network. Some manufacturers advised us not to go with IGBT because the power quality problems experienced by the region go beyond simple voltage instability and damage the power electronics. It is because of the above that we move to electromagnetic/servo motor-based voltage stabilizer. Other related specifications are in below table.</p> <table border="1" data-bbox="703 506 1398 1238"> <thead> <tr> <th>Characteristics</th> <th>Three-Phase unity</th> </tr> </thead> <tbody> <tr> <td>Input voltage</td> <td>3Phase+N, 400V ±15%,</td> </tr> <tr> <td>Output</td> <td>3phase+N, 400V ±1%</td> </tr> <tr> <td>Frequency</td> <td>50 ±5%</td> </tr> <tr> <td>Efficiency</td> <td>> 98%</td> </tr> <tr> <td>Configuration</td> <td>Independent regulation of each phase</td> </tr> <tr> <td>Type of cooling</td> <td>Air cooling</td> </tr> <tr> <td>Protection degree</td> <td>Designed for indoor continuous operation (IP 21 indoor use)</td> </tr> <tr> <td>Insulation</td> <td>Class B</td> </tr> <tr> <td>Wave form Distortion</td> <td>None</td> </tr> <tr> <td>Effect of load power factor</td> <td>Nil</td> </tr> <tr> <td>Ambient Temperature</td> <td>0-55⁰ C</td> </tr> <tr> <td>Rating</td> <td>1250 & 400kVA</td> </tr> </tbody> </table>	Characteristics	Three-Phase unity	Input voltage	3Phase+N, 400V ±15%,	Output	3phase+N, 400V ±1%	Frequency	50 ±5%	Efficiency	> 98%	Configuration	Independent regulation of each phase	Type of cooling	Air cooling	Protection degree	Designed for indoor continuous operation (IP 21 indoor use)	Insulation	Class B	Wave form Distortion	None	Effect of load power factor	Nil	Ambient Temperature	0-55 ⁰ C	Rating	1250 & 400kVA
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LOT 3. UPGRADE OF SCADA SYSTEM, MODIFICATION AND INTEGRATION OF THE NEW EQUIPMENT																												
7.	Share the Schematic Drawings of the entire System for better understanding.	Refer to SD001 in the attachment																										
8.	Share the List of components currently integrated in the existing system	Refer to the page 64, 65 and 66 of the tender document																										
9.	Share the Shop Drawings of all the Control Board	We will share as build; shop drawings are your responsibility. Refer to the drawings in the attachment (PLC wiring cabinet and Armoire automate de gestion). However, the list of equipment to be monitored is in the tender document (Page 64, 65 and 66).																										



10.	Share the list of other required hardware and software i.e. License details, PC Specs etc.	Existing software specs: Complicity by GE PC specs: Model DELL P2213
11.	All screenshots (SCADA HMI) to give a full picture of what is being monitored. From Dashboard to detail screens.	Refer to the attached screenshot, however the list of equipment to be monitored is this tender document (Page 64, 65, and 66)
12.	How many Tags are currently being monitored (information points tracked from PLC by SCADA)?	Refer to the SD003 for Upgraded PLC M340 communication networks
13.	Information on what is being monitored (current and desired)?	The information to be monitored is usually defined by the manufacturer of the equipment to be monitored and will be provided whenever the supplier of that equipment is confirmed and during software development, with others of the existing equipment.
14.	Existing connections from PLC to equipment (Direct, Modbus Serial, Modbus TCP/IP)?	Refer to the response LoT1 2.a (For the existing system architecture, the Modbus TCP/IP protocol is used, and Ethernet through the adapter (170 ENT 11001) in the LV cabinets and UPSs.
15.	How many PLCs in the network and their manufacturers?	Currently, with existing equipment, there are 7 but keep in mind that there is additional new equipment to look out for as per the tender document. Manufacturer is Schneider.
16.	Communication protocols available on the current PLCs (Ethernet, serial, etc.	Communication module features available on Modicon M340 2020CPU are (Ethernet, Modbus serial and USB).
17.	Existing M340 model and BOM, including Firmware, CPU, Expansion Boards, Power Supply?	Modicon M340, BMX P34 2020CPU, the power supply of M340 PLC is 24VDC. Other additional information, please refer to the datasheet on Schneider web/ Modicon M340 for Ethernet Communications Modules and Processors.
18.	Energy Meters in use in the installation?	Existing energy meter to be replaced are the type of Enerdis, the specs of energy meters to be installed are the following: a) Power & Energy meter, 31st harmonic, LCD and RS485 to facilitate the connection with the PLC and then to the SCADA system.
19.	Could you share with us the existing software being used? Any details regarding this would be highly beneficial.	Existing software specs: Complicity by GE PC specs: Model DELL P2213
20.	In terms of the server setup, would you prefer a single server configuration or a redundant setup?	As long as the system is for monitoring only, a single server is enough

21.	As long as the system is for monitoring only, a single server is enough	Users cannot exceed two (Admin and user)
22.	What is the existing SCADA used for? Control & Monitoring or Monitoring only	Existing SCADA is for monitoring only
23.	If the existing SCADA perform both control and monitoring functions, could you please specify among these equipment, which one does the SCADA monitors only and which ones does it, monitor & control?	The existing SCADA is currently out of service, but it used to be for monitoring
24.	The SCADA to be supplied has to be performing both control & monitoring functions?	At the moment shall be for monitoring only as the existing. However, a provision to add the control mode is also acceptable.
25.	Will the SCADA to be supplied be used to monitor and control all those equipment? Or monitor all and control some (please specify them)?	The list of equipment to be monitored is in the tender document (Page 64, 65, and 66).
26.	Request Type RFD: Main LV panel drawing	Please refer to SD 001
27.	Request Type RFD: Drawing for proposed change in the Main LV panel for new 800A C.B. in 630A C.B.	In the same drawing SD 001, an existing CB 3&4 of 630 shall be replaced by an upgraded to 800A, same to CD5&6.
28.	Request Type RFD: Generator Control Panel drawing (Automatic control) (PLC panel)	Refer to the attached drawing called PLC wiring cabinet and Generator automatic control panel.
29.	Request Type RFD: Main PLC panel drawing	Refer to the attached drawing called PLC wiring cabinet
30.	Request Type RFD: SCADA Architecture drawing: This drawing should show the connection of all the equipment with the PLC and mode of communication	Refer to the attached drawing called
31.	Request type RFD: Existing SCADA program backup.	Not necessary at this stage, it will be share to company owned the contract.
32.	Request Type RFI: Screenshot for existing SCADA screens.	Given

33.	Request Type RFD: Proposed connection drawing of new AVRs with Main LV panel: Provide a drawing that outlines the proposed connection of the new Automatic Voltage Regulators (AVRs) with the Main LV panel.	Refer to SD001
34.	Request Type RFI: Redundancy for SCADA Server: Is redundancy for the SCADA server required? Please clarify.	Not required

Sincerely,


Charles HABONIMANA
Managing Director

PLC Cabinet wiring

Main Switch

Main Power House PLC	MPLC – MS-01	1
	SCADA – MS-02	2
Power House Generator 1	GEN1 – MS-03	3
Power House Generator 2	GEN2 – MS-04	4
Power House Generator 3	GEN3 – MS-05	5
Power House External Generator	G1EXT -MS-06	6
Power House External Generator	G2EXT -MS-07	7
Power House Fiber Switch	FSWH -MS-08	8
LV Board BT05 BT08	BT05-08-MS-09	9
LV Board BT07 BT10	BT07-MS-10	10
LV Board BT08 BT11	BT08-MS-11	11
LV Board BT02 BT03 BT04 BT05	BT02-03-04-05-MS-12	12
LV Board BT01 BT06	BT01-06-MS-13	13
LV Board BT09 BT014	BT09-MS-14	14
LV Board BT10 BT015	BT10-MS-15	15
Free		16
Free		17
Free		18
Free		19
Free		20
Free		21
Free		22
Free		23
Free		24

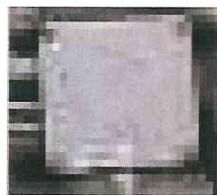
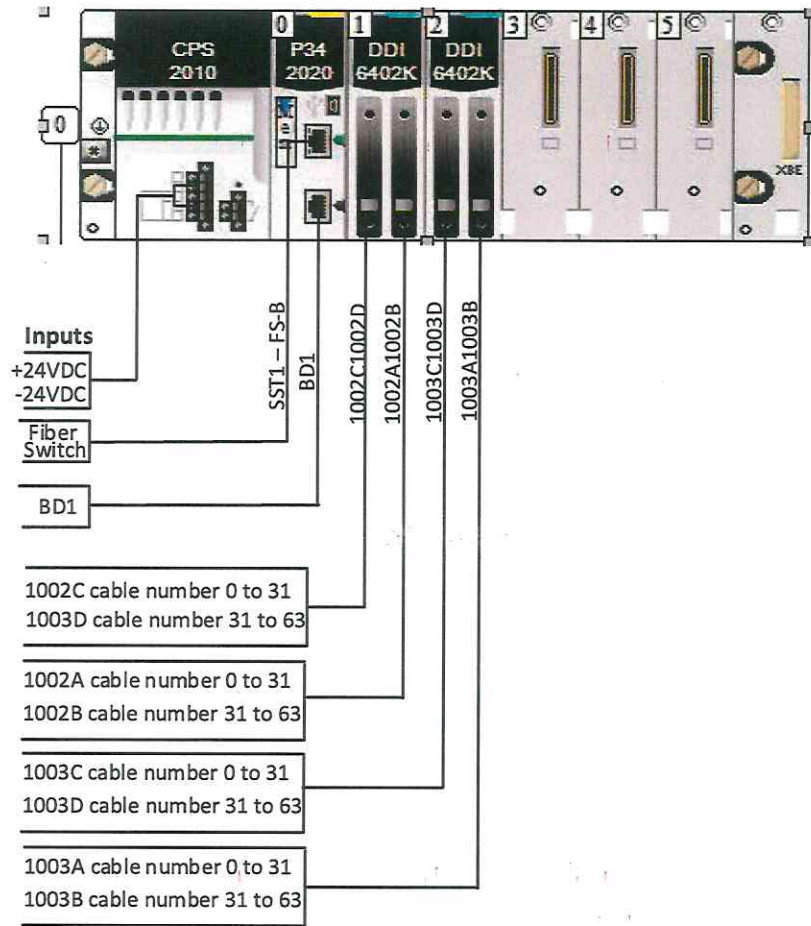


Main Switch



Fiber Switch

SST1



BD1

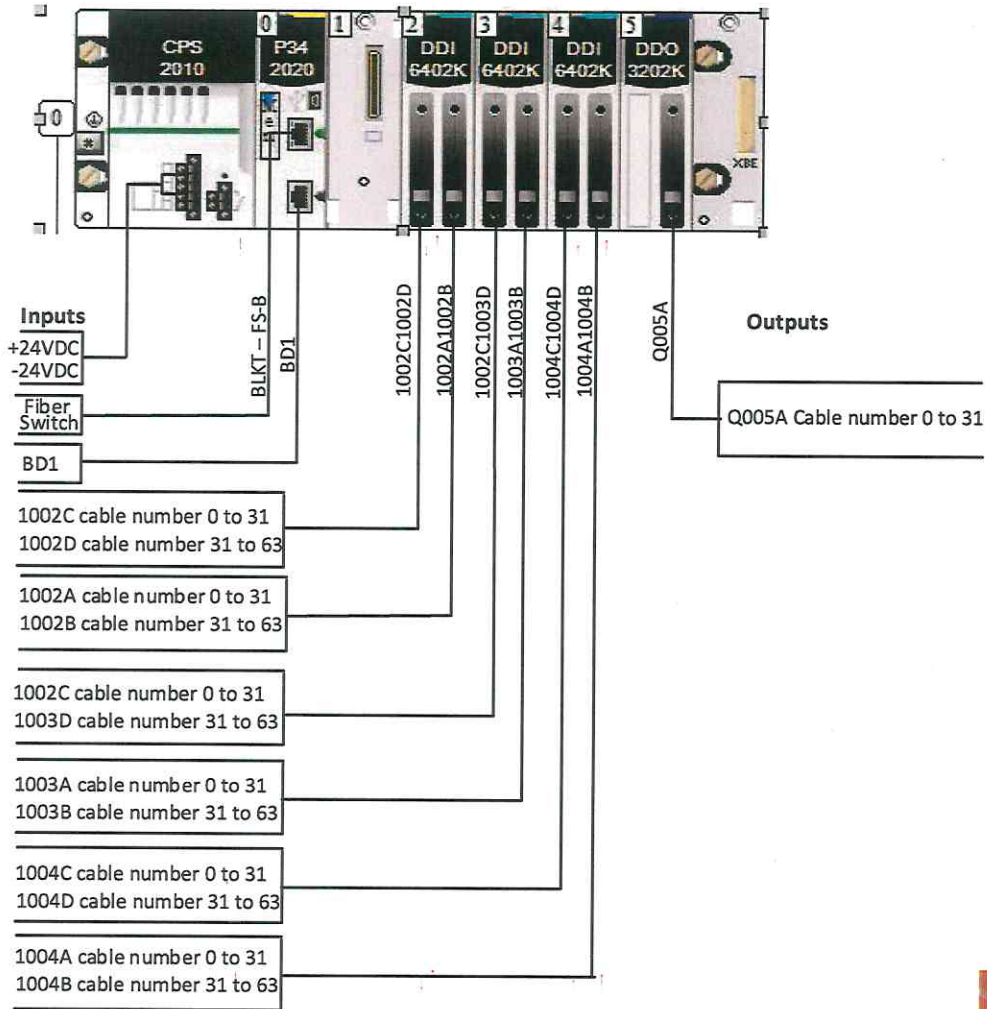


INPUT MODULES



FIBER SWITCH

Block Technique



Input Modules



BD Module



FIBER SWITCH

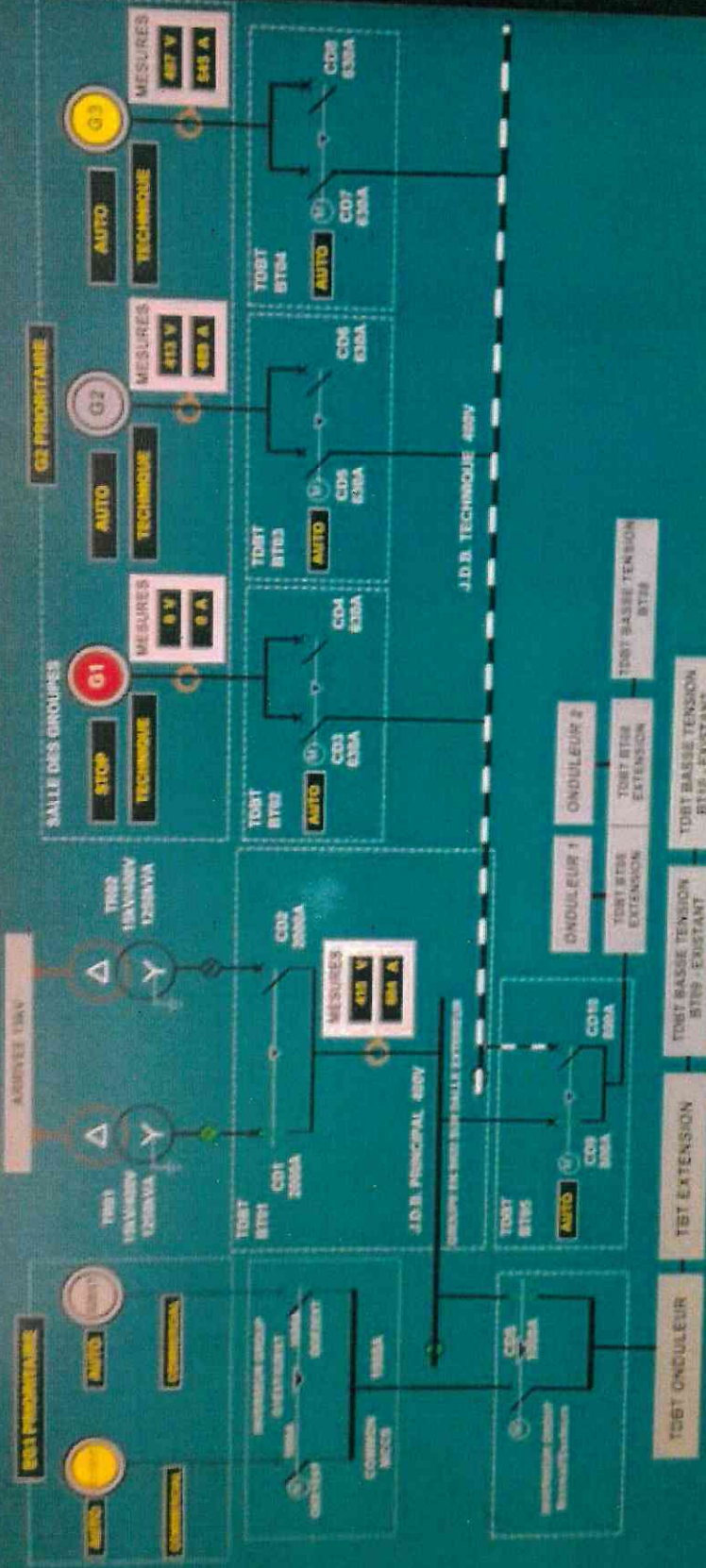


Output Modules

S1 P2 DISPARU
 S1 P2 NORMAL
 S1 P2 ALARME
 S1 P2 ALARME
 S1 P2 DISPARU

0300001 14 20 00 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)
 0300002 00 20 01 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)
 0300003 00 20 02 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)
 0300004 00 20 03 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)
 0300005 00 20 04 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)
 0300006 00 20 05 100 8113-047 850 DISTRIE 230V ONDULEUR(0642)

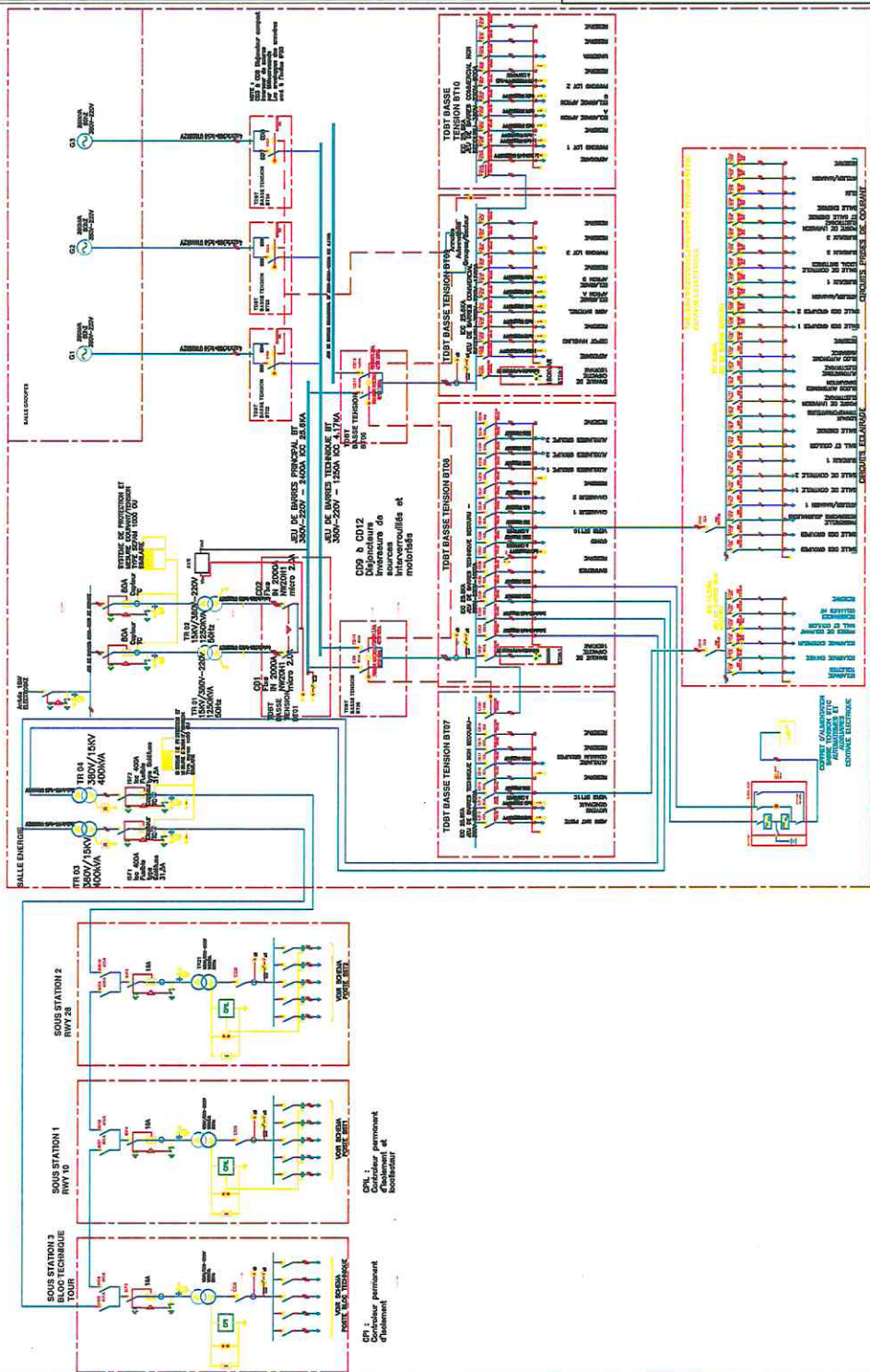
CONTRÔLE ÉLECTRIQUE - SALLE ÉNERGIE - DISTRIBUTION BASSE TENSION



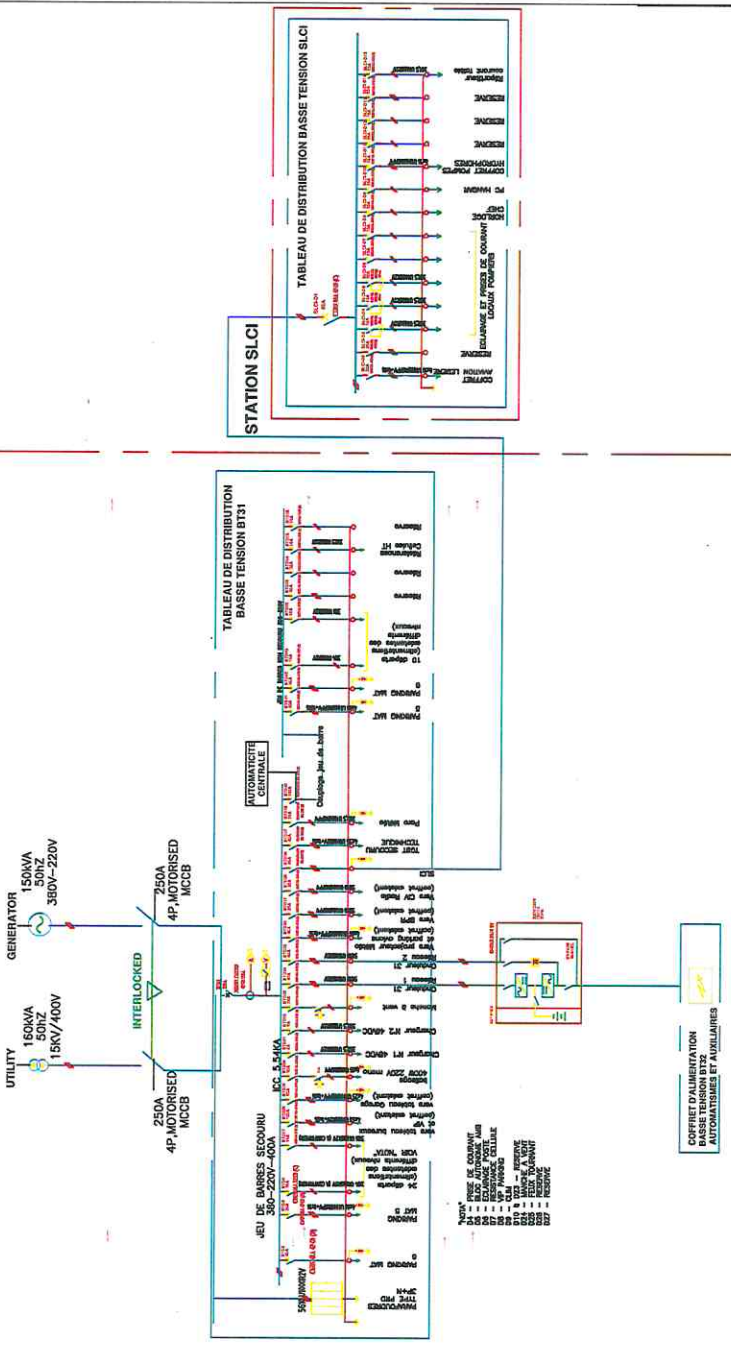
SCHEMA SYNOPTIQUE
 SYNOPTIQUE GENERAL
 SOMMAIRE HISTORIQUES
 PAGE DES CONSIGNES
 PAGE D'ALARME
 ACCUIT DEFAULTS
 ARRÊT KLAXON

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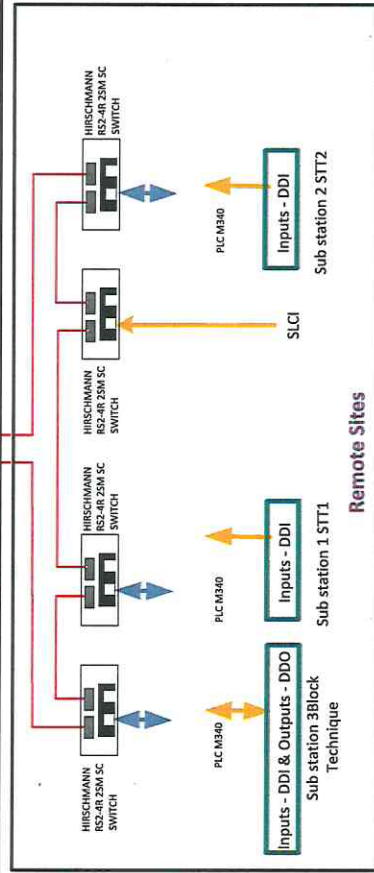
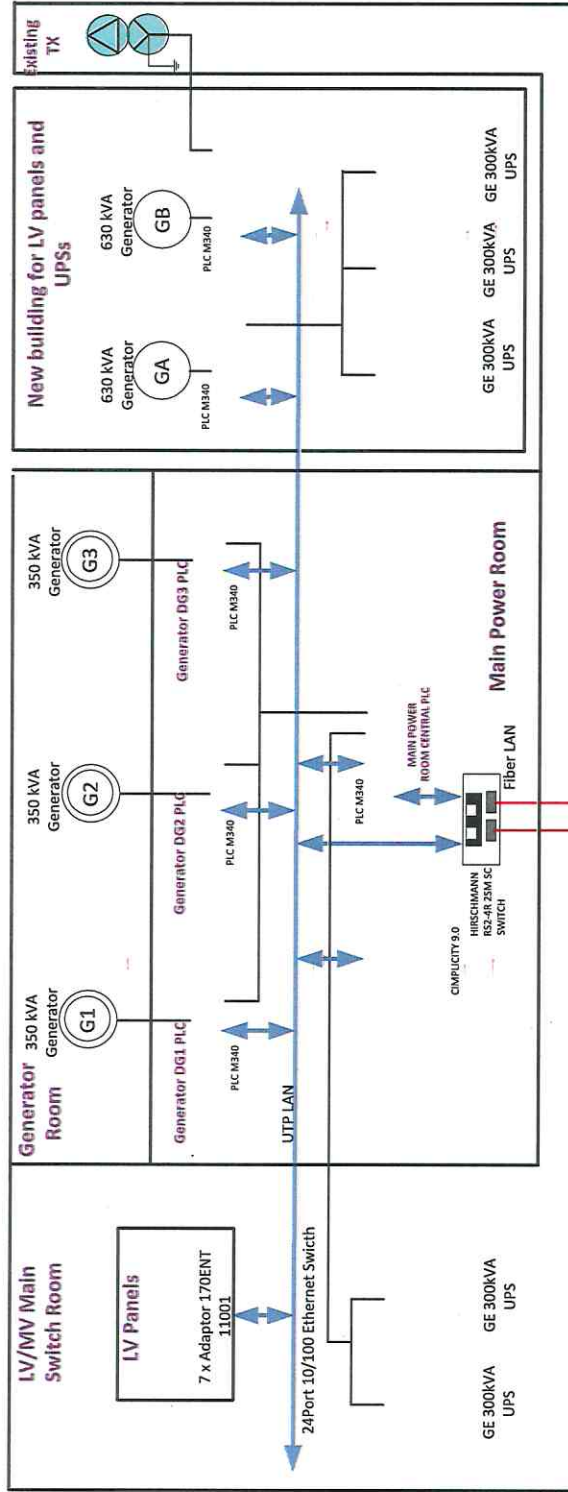
CENTRALE ELECTRIQUE SD 001



BLOC TECHNIQUE SD 002



Upgraded PLC M340 Communication Network



- Key**
- Serial communication RS485
 - External fiber links
 - Digital Data
 - 10/100 UTP Ethernet Lan

PLC SYSTEM ARCHITECTURE SD003