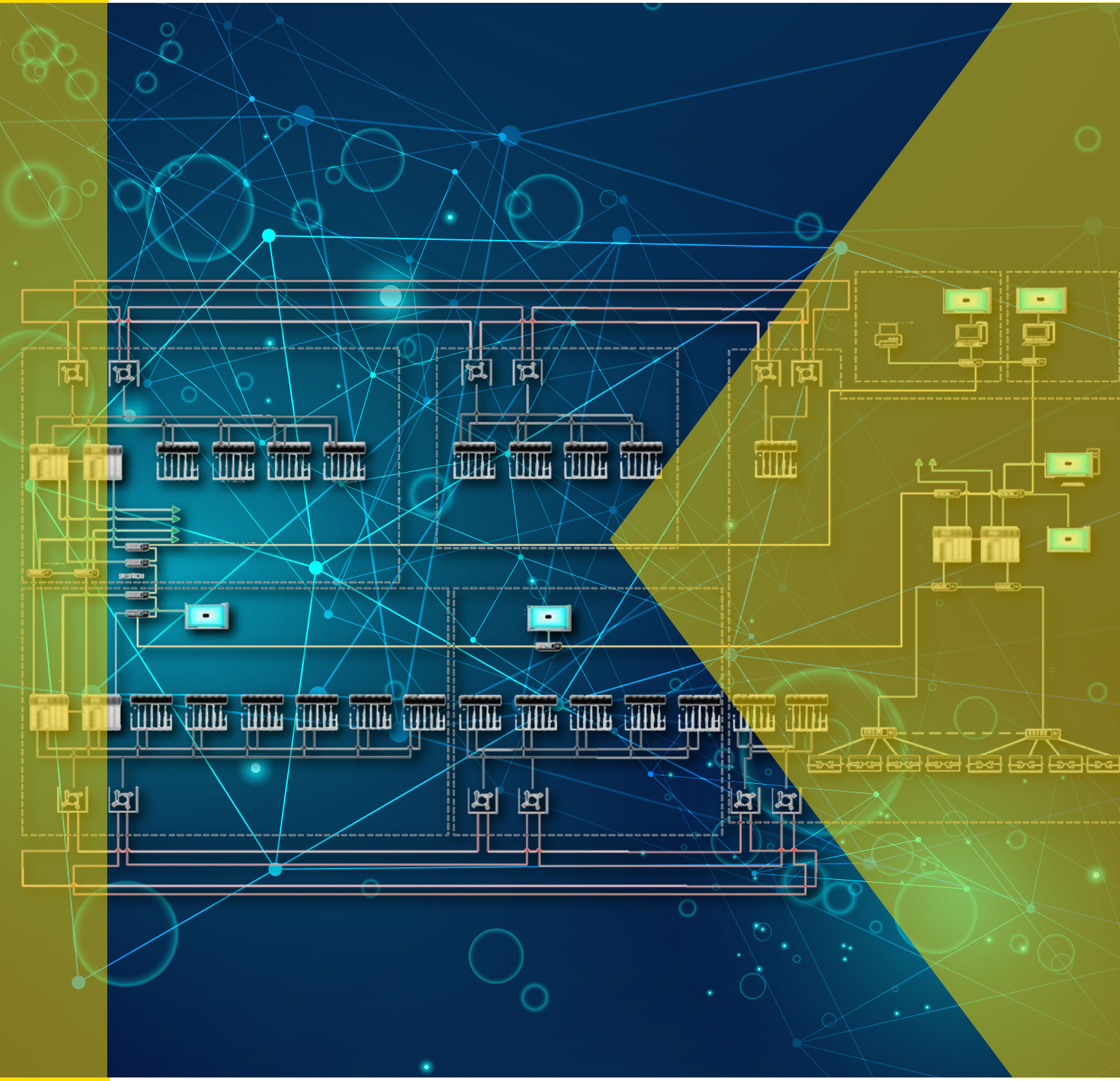
Power Automation & Supervision Control System - Industrial Automation Digital Switchboards

Automation and control System



IMESA® AUTOMATION ENGINEERING

Production facility 10,000 sq.m.
Offices 2,000 sq.m.
Warehouses 1,200 sq.m.
Open area 15,000 sq.m.

IMESA®
ELECTRICAL ENGINEERING

- **Power Management & Control System**
- **Industrial Automation**
- **Digital Switchboard**

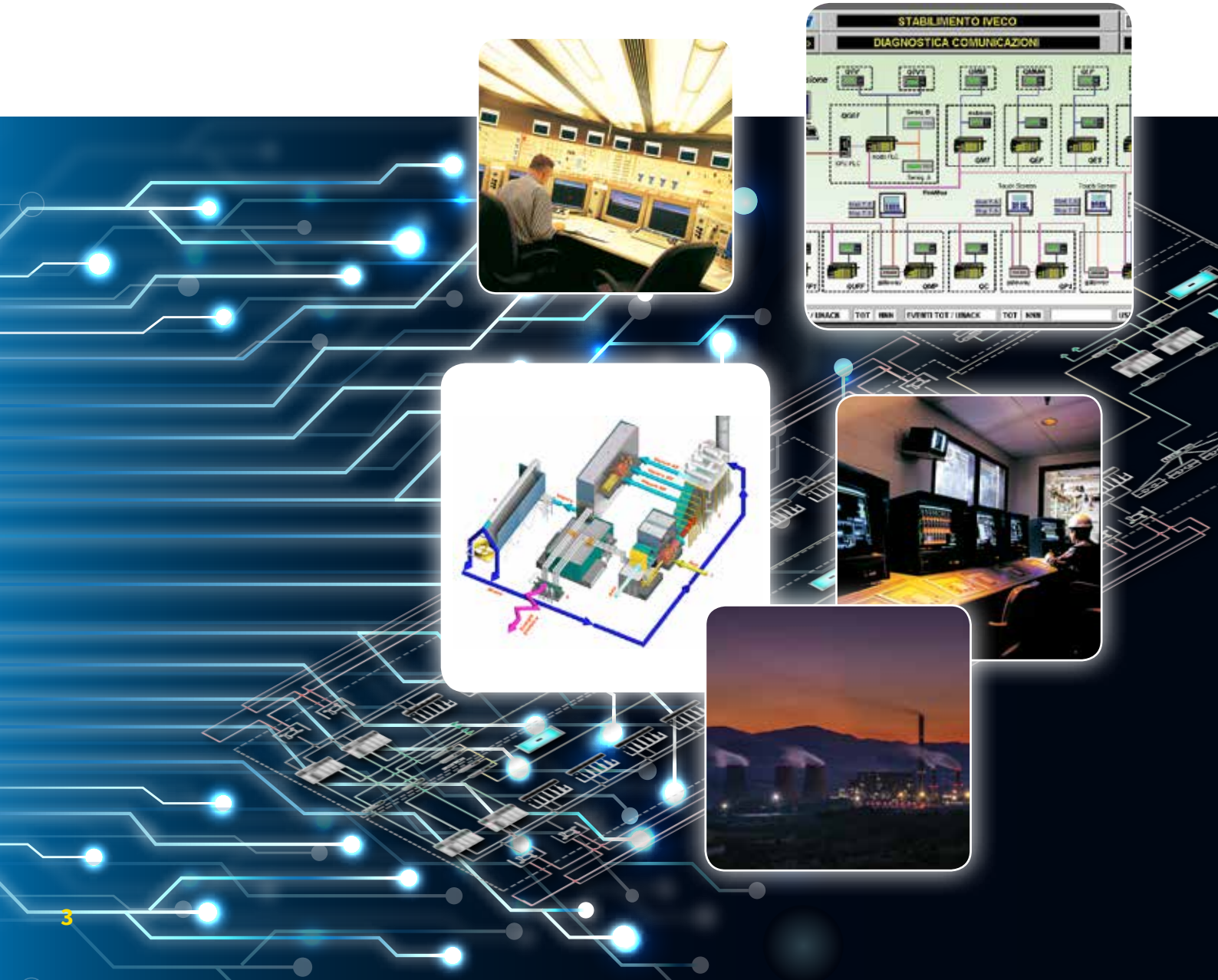
IMESA AUTOMATION ENGINEERING

SIEMENS · Telemecanique · GE · Allen-Bradley · ABB · IBM · hp · WAGO · PHOENIX CONTACT · HIRSCHMANN A BELDEN BRAND · SAIA

IMESA automation engineering

The department automation was born in IMESA in the 90s to meet the increasing demand for integration of supervision and control systems within switchboards.
Since then the department has acquired much experience in the field, gaining significant expertise in integrated automation systems, of industrial electrical installations and / or civilians. Our working philosophy is based on continuous improvement and the ability to adapt to new technologies to meet the most varied demands of the customer. The strong point of our department is the flexibility to design thanks to the knowledge of the products available on the market today, that enables us to realize custom systems, ensuring the highest quality construction and performance.

We build architectures supervisory and control systems optimized with distributed intelligence (for example, interfacing on multiple hierarchical levels using protocols and different physical media, such as copper and fiber optics) where thanks to a thorough knowledge and selection of products on the market, we can achieve remarkable results in terms of quality / cost in the development of projects. The department is composed by core of six people all graduated, plus the support of the electric department for the design of electrical layouts, and the help of ten engineers skilled in switchboards automation. Furthermore depending on the complexity of projects, we have a group of freelance engineers for supplementary support.



We reached a particular experience and competence in power Management and control systems of distribution networks for electricity.

The instruments used are:

- PLC, soft PLC
- SCADA system
- Industrial-PC and Operator Panel
- Remote I/O
- Gateway and Tranceiver (copper, fiber optic, radiofrequency, GSM, etc)
- Data acquisition cards.
- Protocols: IEC61850, modbusTCP/RTU, Profibus-Profinet, Devicenet, KNX, Lorawan, IEC60870-5-104, etc
- Programmable languages: Visual basic.net, Phyton, C sharp
- Tools: Vmware, HyperV, Veam, Acronis, etc

We work with the best brands on the market :

- SIEMENS
- TELEMECANIQUE
- GE
- ALLEN BRADLEY
- ABB
- IBM
- HP
- WAGO
- PHOENIX CONTACT
- HILSCHER
- HIRSCHMANN
- SAIA

.... and other more...

Our applications

AUTOMATION AND CONTROL SYSTEMS

IMESA offers a complete package that includes SCADA Supervision and Control Systems, Industrial Automation and Building Automation.

- **POWER MANAGEMENT SYSTEM AND CONTROL SYSTEM SCADA**
- **INDUSTRIAL AUTOMATION**
- **BUILDING AUTOMATION**

APPLIED PRODUCTS

- **LV Switchboards**
- **MV Switchboards**
- **Containerized electrical substations**
- **High Voltage substations and Power Generation**
- **OIL & GAS process line**
- **Electrical equipment**
- **Shore Connection Solution**

SUPERVISION CONTROL SYSTEM SCADA AND POWER MANAGEMENT SYSTEM

SUPERVISION AND CONTROL SYSTEMS

The use for supervision and control systems allows the monitoring of electrical switchboards and plants, makes ordinary and extraordinary maintenance easier, supports and optimises data storage and can be interfaced to other management software tools. IMESA supplies its supervision and control systems on a turn-key basis and provides its customers with all the servicing required for commissioning the system and subsequent personnel training, running, maintenance and assistance.

TYPICAL ARCHITECTURE OF SUPERVISION AND CONTROL SYSTEMS

The system is designed in order to satisfy all customer's needs. The typical architecture consists of:

• Field level electronic devices (inside the switchboard or automated machinery) which collect digital and analog signals and control the equipment; normally this function is carried out by PLC I/O, by remote control I/O in field bus systems and by microprocessor relays which can communicate via serial interface.

• Interface devices with data concentration function and exchange of communication protocols. At this level can be listed, beside PLC hardware, also some front-end devices, including the D.C.I., a data concentrator designed and manufactured by IMESA.

• Building or industrial supervision devices realized on PC, which can be controlled by the most commonly known and widespread software applications or by means of operator panels. In order to realize each control and supervision architecture, IMESA selects from the market all those products that fit all the customer's needs and which allow the development of the most appropriate structure with respect to the specifications. The use of PLC is always suggested when an extreme response speed is required, such as power grid-generator commutation, automatic by-passing of M.V.-L.V. risers, support between transformers and/or power units.

When the supervision and control system involves the managing of power generation, Load shedding and Load management control, Synchronization and Load sharing logic, we have achieved a "POWER MANAGEMENT SYSTEM".

INDUSTRIAL AUTOMATION

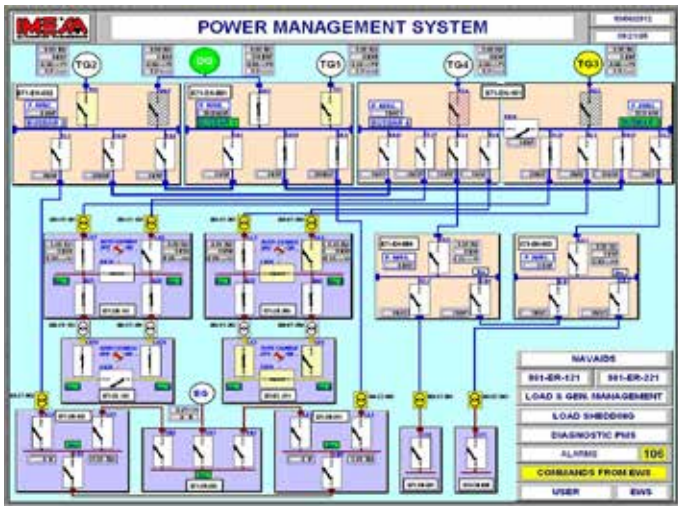
To meet the widest possible range of market requirements, IMESA recently extended its range to include retrofit machine and LV industrial automation and machine switchboards. A control switchboard is typically a LV switchboard designed to connect to industrial automation plants. The typical structure used are those tested by many applications in the automation of our switchboards, such as supervision on PC, use of PLC and operator panels, use of remote control I/O. Automation of productive plants allows to increase the business profitability by improving the product quality, acceptance test procedure and reducing the cost as a result. Industrial automation allows also the improvement of the working conditions by avoiding uncomfortable works and accidents. The supply includes also hardware design (if required). The typical architecture used by IMESA has been successfully used for the switchboard automation and trasforming substation supervision. The supply includes also the design and the development of the software, the commissioning, the acceptance tests and the assistance.

BUILDING AUTOMATION

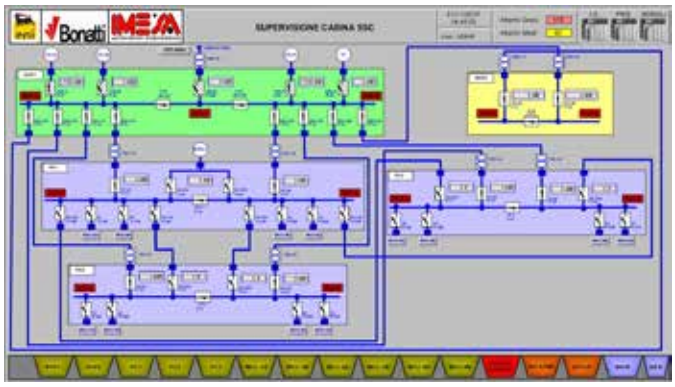
Automation has extended also to the building field. The supervision and control system realized for these applications allows to integrate, by means of one or more PC stations, all the data coming from the following plants:

- **Electric**
- **Fire- fighting**
- **Air conditioning**
- **Antitheft**
- **Remote sensing**

Power Management System (PMS)



Typical main screen (OLT FRSU LNG)



Typical main screen (DBN2 ENI COVA)

CUSTOMIZED
Basing on a standardized platform, any system is strongly customized to be compliant to commitment specifications.

EXPANDABLE
The system is characterized by easy maintainability and strong modularity in order to satisfy future extensions of hardware and logical functions.

FRIENDLY
The HMI is intuitive, easy to manage, allowing the operator to work in complete safety.

RELIABILITY
Redundant architecture and/or distributed intelligence over more levels to guarantee maximum reliability.

Typical PMS Architecture

• Double supervision system composed by operator workstation (OWS), Engineering workstation (EWS).

• Main panel composed by double programmable logic control units (Main PLC) in redundant configuration, redundant power supply modules, complete with digital inputs and outputs, communication cards interfacing OWS/EWS and field devices (distributed I/O modules, relay protection, synchronizing devices, etc).

• Synchronizing devices installed in cubicle of incoming and bus tie circuit breakers of HV switchboards.

• Redundant Ethernet LAN for interconnection PMS Main PLCs and Supervision system.

• Fiber optic rings Ethernet LAN, for interconnection between PMS Main PLCs and Remote I/O modules or distributed controllers, etc.

• Serial connections between PMS and electrical utilities (UPS, DCP, etc).

• Redundant bump-less Ethernet fiber optic link between PMS Main PLCs and DCS system or other third part systems.

PMS Case Study

Based on following projects:
SAIPEM KARIMUN YARD SAIPEM KARIMUN YARD (Karimun Indonesia) 2010 – 2012
N° 27 HV Switchboards
N° 21 LV Power Centers

OLT FRSU LNG
N° 7 HV Switchboards
N° 8 LV Power Centers/MCC
N° 2 UPS/DCP

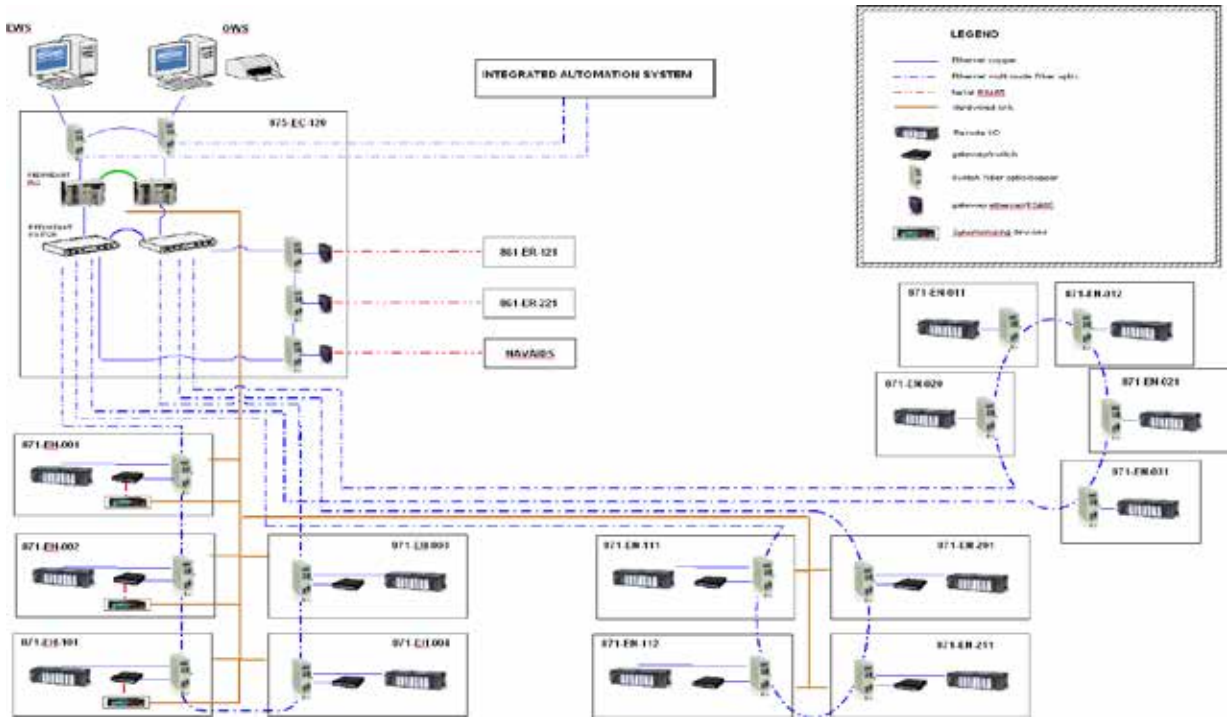
DBN2 ENI COVA
N° 7 HV Switchboards
N° 8 LV Power Centers
N° 15 LV MCC
N° 4 UPS/DCP

SAIPEM KARIMUN YARD SAIPEM KARIMUN YARD (Karimun Indonesia) 2010 - 2012
GENERAL INFORMATION
Saipem Karimun Fabrication Yard is currently the biggest fabrication installation in Southeast Asia, acting as a key player in the Oil&Gas Industry in Indonesia. Jointly with the Jakarta EPCI Centre, Saipem Indonesia is qualified to perform engineering, procurement, construction and installation for both offshore and onshore projects.
Overall area sq.m 1,392,382
Overall office area sq.m 6,276
Overall fabrication area sq.m 783,821
Utilities and services area sq.m 235,741
Dumping area and marine base storage sq.m 221,028
FABRICATION AREA
Overall covered fabrication area sq.m 60,724
Overall open fabrication area sq.m 723,097
QUAY
Length m 900

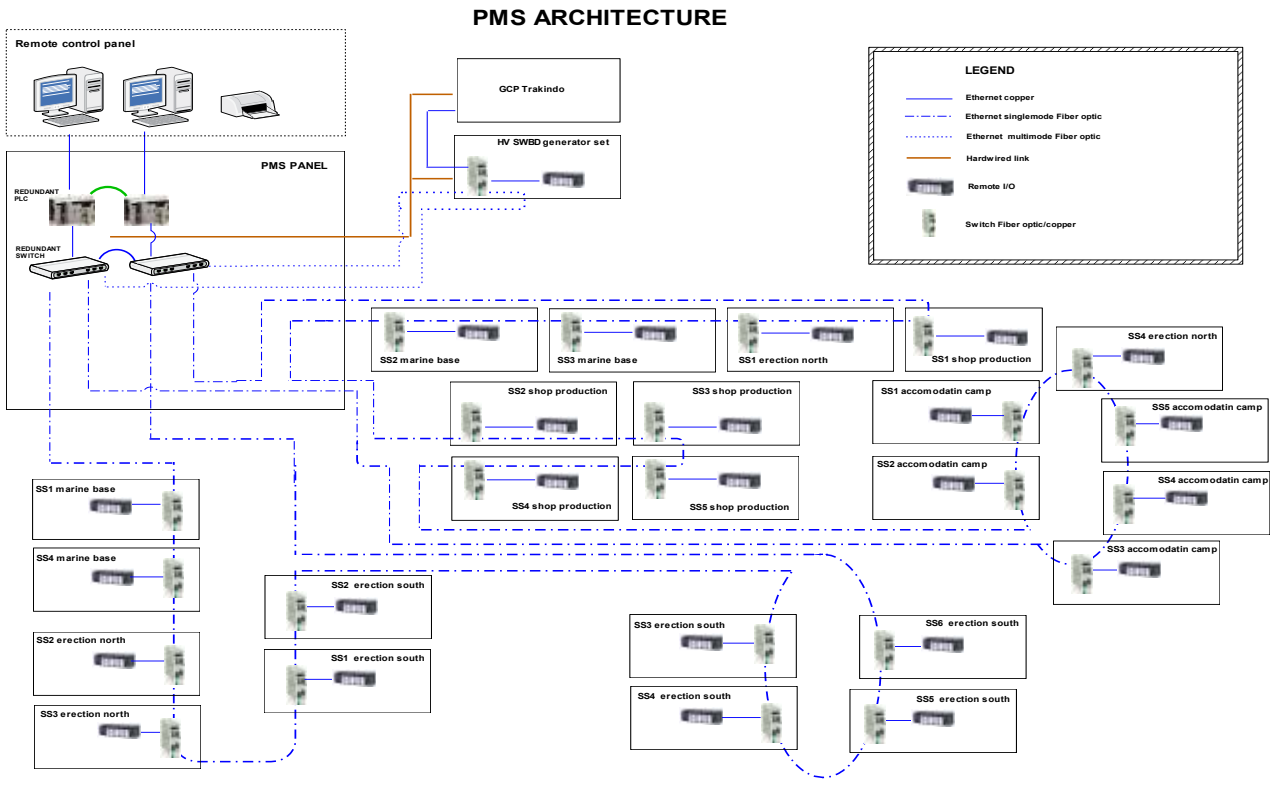
OLT FRSU LNG (Livorno Italy) 2011 – 2014
The OLT project consists in the conversion of an existing LNG carrier ("Golar Frost") into a floating regasification terminal, which transforms the liquefied natural gas (LNG) back to its normal gaseous state:
• 137.000 cubic meters of LNG Storage capacity
• 3,75 billion cubic meters natural gas per year
• 4 spherical storage tanks
• 30 x 32,5 meters regasification module

DBN2 ENI COVA 2013 - 2016
DBN GAS PHASE 2 (DBN2) project (2013- 2016) is the building of new fifth line GAS methane production, with reduction of emissions in atmosphere and revamping of electrical distribution with the addition of Power management system (PMS) of about 60.000 points.
The Val d'Agri Oil Center (COVA), in operating since 2001 in the industrial area of Viggiano (PZ), occupies an area of approximately 180,000 m2 and is the result of the enlargement of the "Monte Alpi Oil Center". COVA has a daily handling capacity of 104,000 barrels (about 16,500 m3 of oil) and 4,660,000 sm3 of gas associated with crude oil. Within the COVA, the hydrocarbons produced from the reservoir, separating oil, gas, and layer water are treated. The crude oil is stored in special tanks and then is transfered by pipeline to the Refinery of Taranto city for refining. The methane gas is desulfurized, dehydrated and condensed and transferred into the national distribution network "Snam Rete Gas" through a pumping station. Finally, the water from the residues of hydrocarbons and gas inside the COVA are cleaned, through authorized treatment centers.

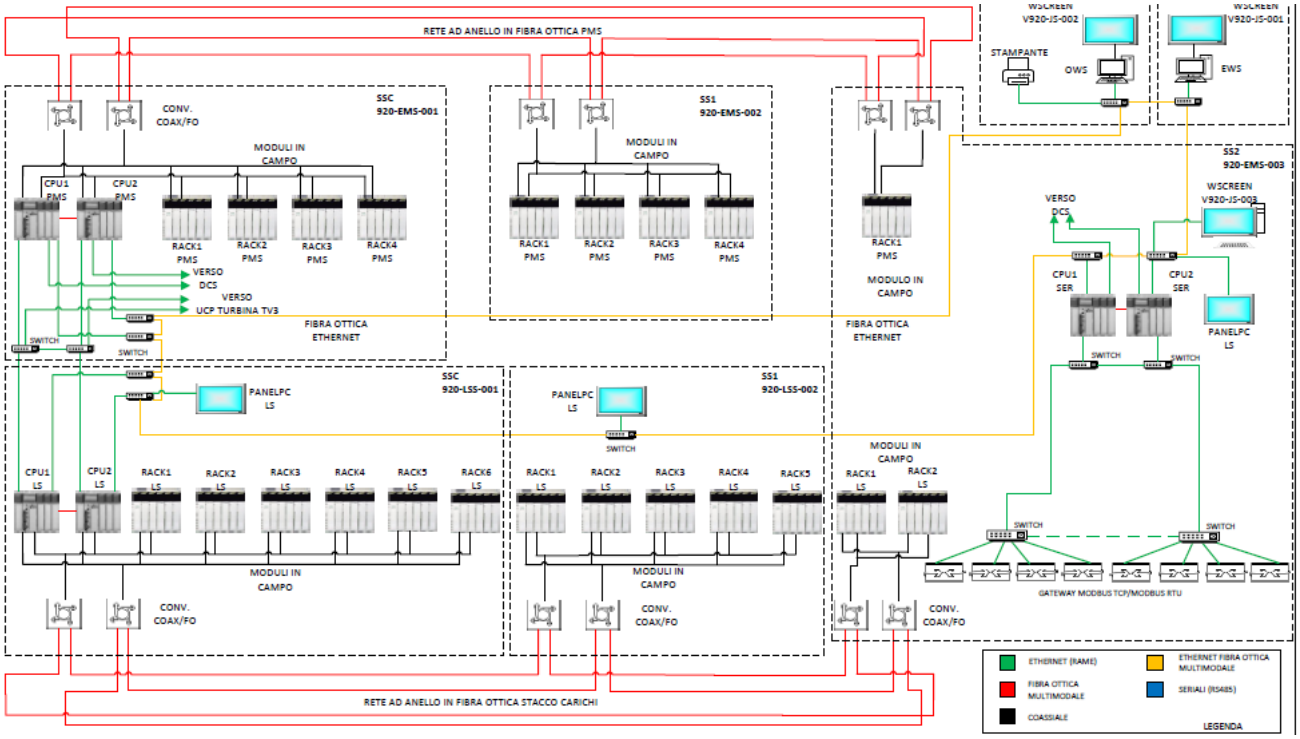
Typical PMS redundant architecture (OLT FRSU LNG)



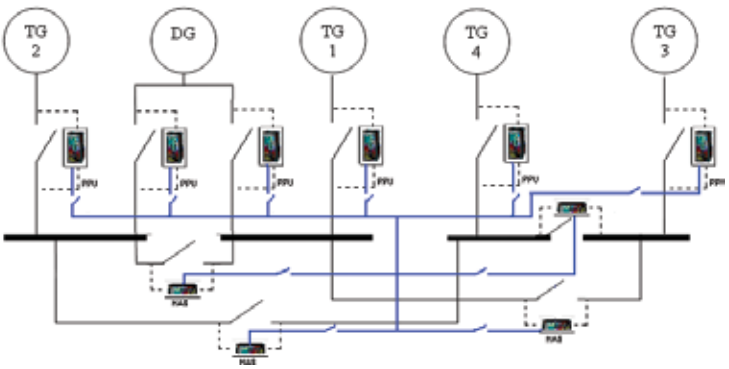
Typical PMS redundant architecture (Saipem Karimun Yard)



Customized PMS architecture redundant with distributed intelligence (DBN2 ENI COVA)

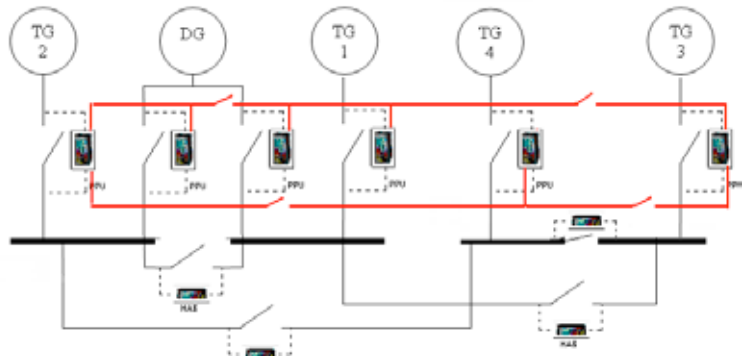


General functions



Management of

- Generators
- HV/LV switchboards
- Incoming breakers
- Tie-Breaker/Interconnector
- Feeders, etc.



Synchronization

- Load sharing
- Load shedding
- Load management
- ATS
- Black out resolution
- Network managment

Control System

The control management is typically composed by two Main PLC in redundant configuration (HOT BACK-UP). Each controller will be able to manage the entire plant, so in the presence of breakdown hardware, all functionality will be guaranteed, automatically, without loss of information, and without need for manual settings.

The communication between the two controllers will take place in real time via direct link, so that in case of malfunction of one CPU PLC the continuity of control will be ensured.

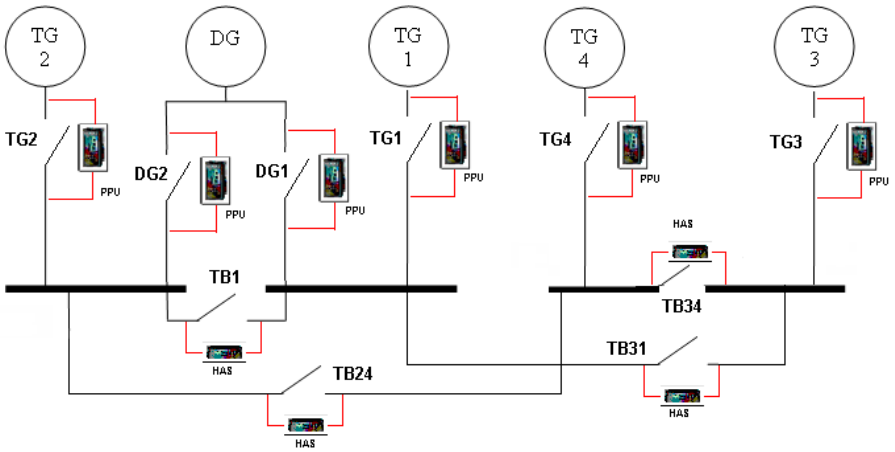
The redundant Main PLC has the function of processing logic control and data concentrator.

The Main PLCs are composed by:
- CPU
- Digital input cards
- Digital output cards
- Analogue input cards
- Interface cards
- Power supply 24Vcc

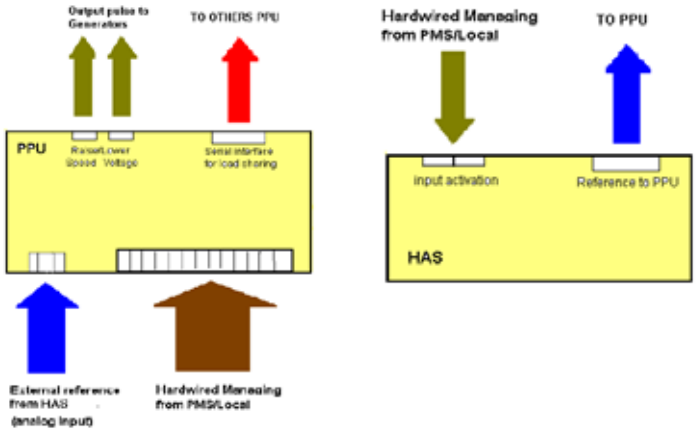
The performance of control system allows to operate within very short time of 100/200 msec for critical sequences (Load shedding) through hardwired links and serial protocols (IEC 61850, etc).

The control System is equipped with a sufficient number of digital I/O cards, interface cards, field devices, synchronising devices to perform the following functionality:
- Sending to HMI operator stations the equipment status, events and alarm
- Opening and closing management of circuit breakers
- Acquisition status of field devices
- Reading of protection relays and other equipment measurement
- Acquisition of oscilloperturbography data
- Acquisition and recording of equipment status, events and alarm
- Acquisition of measures/alarms/states by means of bus protocol from field equipment. Bus protocols: IEC61850, modbus TCP/ RTU, Profinet/profibus, etc
- Load shedding management
- Generators synchronization and deload sequences management
- Load sharing management: active power sharing, fixed frequency, reactive power sharing, constant power factor, fixed voltage
- Management of redundant communications with remote equipments
- Management of redundant communications with DCS and/or third part systems
- Management of redundant communications with synchronization devices and generators control panel
- Communication management with UPS, DCP, etc
- Monitoring of PMS communication network

For the most critical functionality, as Synchronization, Load Sharing, and Load Shedding the use of hardwired links or advanced protocols like IEC61850 will be evaluated.
The Synchronization functions could be implemented inside the Generator systems, or directly by PMS. In any case the PMS is the main system to manage the entire power plant, therefore all subsystems, as Generators are managed by PMS. For direct operations of synchronization dedicated equipment are used, e.g DEIF manufacturer, installed in any cubicle of incoming and bus tie circuit breakers involved in generation:

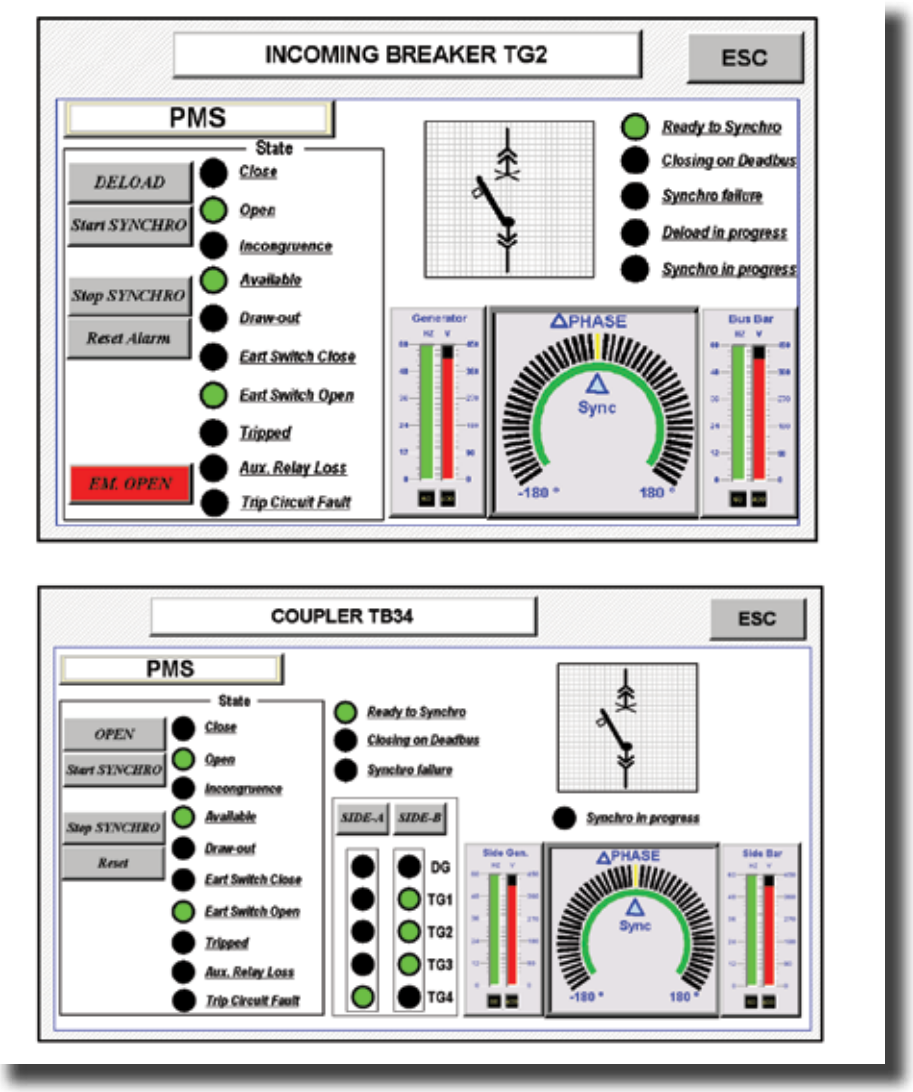


Typical equipments used:
- Paralleling and Protection Unit (PPU), for the incoming generators circuit breakers.
- Paralleling relays (HAS) for Tie-Breaker with synchronization



ACTIVE POWER SHARING, FREQUENCY CONTROL AND REACTIVE POWER SHARING / VOLTAGE CONTROL
The Load sharing mode will be automatically selected by PMS when it detects two or more generators running in parallel. The load sharing (KW, Var, Hz, V) regulators are active when the load sharing mode is selected. When running in parallel, the Parallel controllers transfer each other, in real time via serial link, the power and frequency set point of each generator.The share data shall update the power set-point of generators considering the plant power demand and number of generators running, and type of regulation, fixed Power, Droop, Isochronous.

SYNCHRONIZATION
The synchronization is normally a hardwired circuitry with synchronizing equipment. The Main PLC in redundant configuration will be able to manage all critical functionality. In case of break down of Communication network the control of synchronization sequences will be guaranteed. From PMS Operator workstation installed in Central Control Room it will be possible to operate through dedicated video page allowing the following:
• Verify the availability of generator being synchronized
• Opening the dedicated incoming breaker
• Opening the dedicated Tie-Breaker (interconnector)
• Monitor the synchronization in progress through the blinking led at video
• Interrupt synchronizing sequence.
The synchronizing of incoming generators and interconnectors can be initiated at PMS console. For more flexibility in operation it is also possible to carry out the syncronization locally at the front of each generator incoming and interconnector.
From Operator Workstation the synchronisation of generator will be fully automatic. The breaker of generator to be connected to the network will be selected and then synchronizing sequence will be initiated by operator.



The voltage /speed adjustment will be controlled by dedicated devices until the closing of CB. For bus-tie and interconnectors, the automatic synchronizing identify the network configuration and automatically set the generators for synchronizing after the operator has chosen which side of Tie-Breaker/interconnector have to be synchronized.

LOAD MANAGEMENT SYSTEM (LMS)
Load Management System (LMS) shall ensure in all plant configuration the correct power balance between the load demand and generation. The LMS function shall continuously monitor the Load Demand and provide the adequately spinning reserve in the power generation. The LMS shall be designed to raise a warning to the operator when generator loading factor exceeds pre-set critical value. Duty of the Operator will be to connect split system or to start available stand-by generator. The deload function is inhibited if only one generator feeds the loads. The deload function is also inhibited in case the balance generation/loads becomes negative after disconnection of one source generation from the network. Generator minimum power: the function shall continuously verify the balance of plant demand and generated power and verify load rating of each generator. When power delivered by Generator approach the minimum allowed, the operator will be warned in order to be enabled to decide to stop one of the running generators or PMS proceed automatically.

LOAD MANAGEMENT SYSTEM (LMS)
The functionality LMS checks the availability of starting active and reactive power for high voltage motors when coming a request to start from the process system (DCS). The final start is managed by PMS: The check of active and reactive power available is carried out according to particular formula/scenario and/or LOAD MANAGEMENT MATRIX:

Load Management System - HV Motors Permissives Matrix

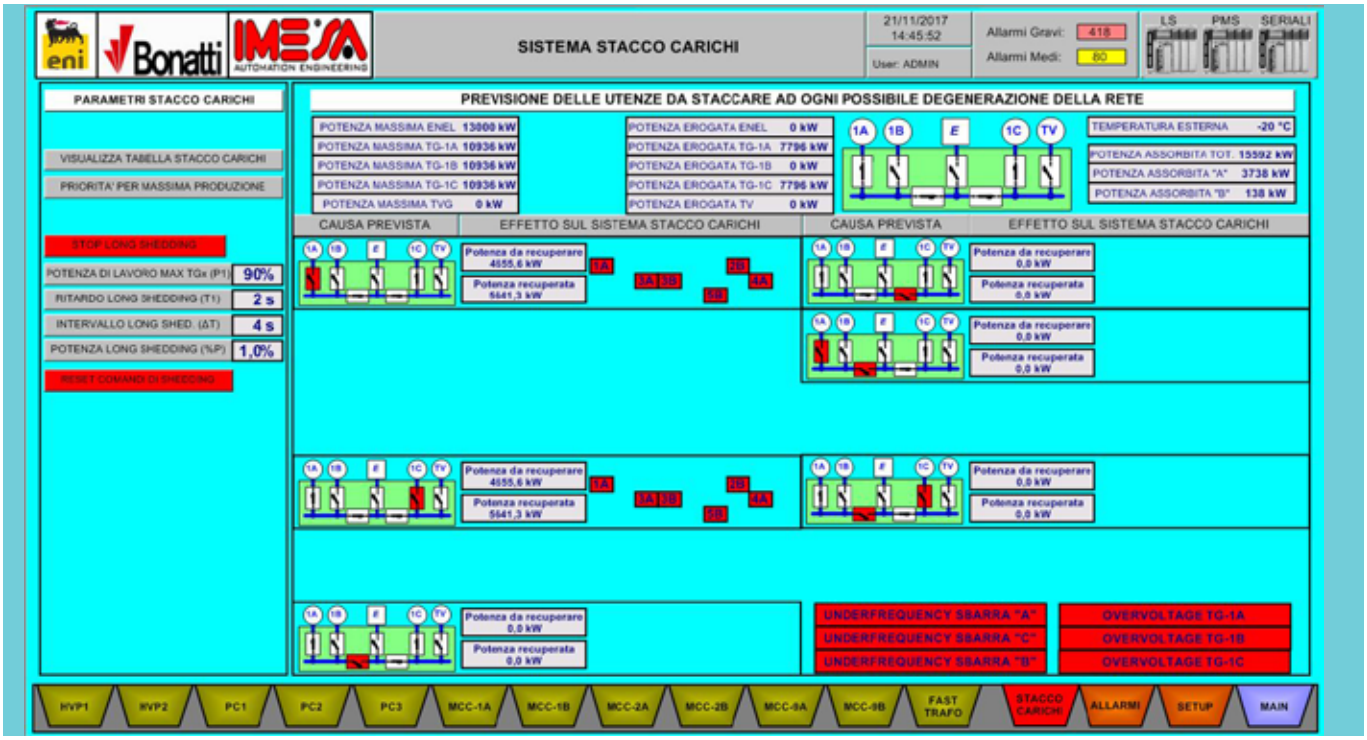
		90% Rated P	Generator	PF	Generators Configuration											
		3015	DG	0,8	1				1				1			1
		3015	TG1 / TG2	0,8		1	2		2	1	2		2	1	2	1
		9000	TG3 / TG4	0,8				1		1	1	2	1	2	2	2
			P (kW)		3015	3015	6030	9000	9045	12015	15030	18000	18045	21015	24030	24030
			Q (kvar)		2261	2261	4523	6750	6784	9011	11273	13500	13534	15761	18023	18023
			Psudden_max%		25%	50%	50%	50%	25%	50%	50%	50%	25%	50%	50%	25%
			Psudden_max		837,5	1675	3350	5000	2512,5	6675	8350	10000	5012,5	11675	13350	6675
	Intank P/P	kW	145	Pmax	2870	2870	5885	8855	8900	11870	14885	17855	17900	20870	23885	23885
PF	0,89	kVAr	74	Qmax	2187	2187	4448	6676	6709	8937	11198	13426	13459	15687	17948	17948
			1125													
	Ballast P/P	kW	375	Pmax	2640	2640	5655	8625	8670	11640	14655	17625	17670	20640	23655	23655
PF	0,79	kVAr	291	Qmax	1970	1970	4231	6459	6493	8720	10981	13209	13243	15470	17731	17731
	Cargo P/P	kW	484,7	Pmax	1727	1727	5545	8515	8560	11530	14545	17515	17560	20530	23545	23545
PF	0,89	kVAr	248	Qmax	1295	1295	4274	6502	6535	8763	11024	13252	13285	15513	17774	17774
			3150													
	Wobbe Index Air Com	kW	630	Pmax	1569	1569	5400	8370	8415	11385	14400	17370	17415	20385	23400	23400
PF	0,86	kVAr	374	Qmax	1177	1177	4149	6376	6410	8637	10899	13126	13160	15387	17649	17649
	HD Comp	kW	910	Pmax	N/A	N/A	5120	8090	8135	11105	14120	17090	17135	20105	23120	23120
PF	0,87	kVAr	516	Qmax	N/A	N/A	4007	6234	6268	8496	10757	12984	13018	15246	17507	17507
			2850													
	Sea Water P/P	kW	950	Pmax	N/A	N/A	5080	8050	8095	11065	14080	17050	17095	20065	23080	23080
PF	0,86	kVAr	564	Qmax	N/A	N/A	3959	6186	6220	8448	10709	12936	12970	15198	17459	17459
	BOG Comp	kW	1800	Pmax	N/A	N/A	2502	7200	7245	10215	13230	16200	16245	19215	22230	22230
PF	0,89	kVAr	922	Qmax	N/A	N/A	1877	5828	5862	8089	10350	12578	12612	14839	17100	17100
	LNG Booster P/P	kW	2163	Pmax	N/A	N/A	N/A	6837	2221	9852	12867	15837	15882	18852	21867	21867
PF	0,91	kVAr	985	Qmax	N/A	N/A	N/A	5765	1666	8026	10287	12515	12548	14776	17037	17037
	Thruster	kW	2200	Pmax	N/A	N/A	N/A	6800	3792	9815	12830	15800	15845	18815	21830	21830
PF	0,9	kVAr	1066	Qmax	N/A	N/A	N/A	5684	2844	7946	10207	12434	12468	14696	16957	16957

Other example of PMS Load Management function is to manage the fault in open loop electrical network. In open electrical network configuration, the PMS will identify (cable or substation) and isolate the fault location. The PMS will close the line on the other side (closure of circuit breaker originally opened to create the open loop) and display the fault zone in video page. Any open circuit breaker involved directly or indirectly in the fault will stay unchanged. Another function of LMS is to manage the starting order of available generators according to operator setting. The operator will set the starting order of available generator and PMS will proceed automatically to synchronize the selected generators depending by the Weeks and the moment of the Day, basing on priority matrix index, set by the operator (here below an example):

LMS priority matrix

Gen set		Week1		Week2		Week3		Week4	
Nr	Cap	Day	Night	Day	Night	Day	Night	Day	Night
1	10MVA	2	1	3	1	4	4	4	4
2	10MVA	1	2	1	3	6	5	5	6
3	8MVA	3	3	2	2	5	6	6	5
4	8MVA	4	4	4	4	2	1	2	1
5	6MVA	5	5	6	6	1	2	3	3
6	6MVA	6	6	5	5	3	3	1	2

LOAD SHEDDING SYSTEM (LSS)
The functionality will be based on a combination of software and hardware functions with the aim to maintain the highest rate of power supply to loads also in case of sudden loss of one of the running generator, sudden change of configuration (Tie-Breaker open) overload/underfrequency/critical alarms of generator. The LSS function shall also consider the electrical network configuration therefore detects the HV/LV Switchboard interconnections in order to operate with bus bar power sources separated. The Load Shedding operates independently in switchboard section when split operated. The loads to be shed are consequence of Load demand in the various scenarios and considers also the network configuration and generators running. The functionality shall instantly calculate, in predictive way, the amount of power shortage which might occur in case of shedding event, in such a way to define amount of load to be disconnected. The amount of load to be disconnected at fault occurrence will be based on a priority matrix list agreed with process discipline in order to minimize the impact of process production. The priority matrix list shall consider the single loads, if rate is significant, or group of minor loads to be grouped in a process functional unit. Predictive scenarios of load shedding are displayed to PMS video console.



LOAD SHEDDING CONTROL

The priority matrix is divided in different parts, referring to busbars fed from power source incoming breakers. Furthermore the Load Shedding strategy may vary with the moment of the day, therefore Load shedding setting can change depending of the night or the day setting. In case of opening of Tie-Breaker's main busbars opened, the priority matrix zone works independently one from each other. In case of multiple scenario, the priority matrix will be organized in all combination with sub separated sub-matrix as related to sheddable load of each combination of bus bar in parallel.

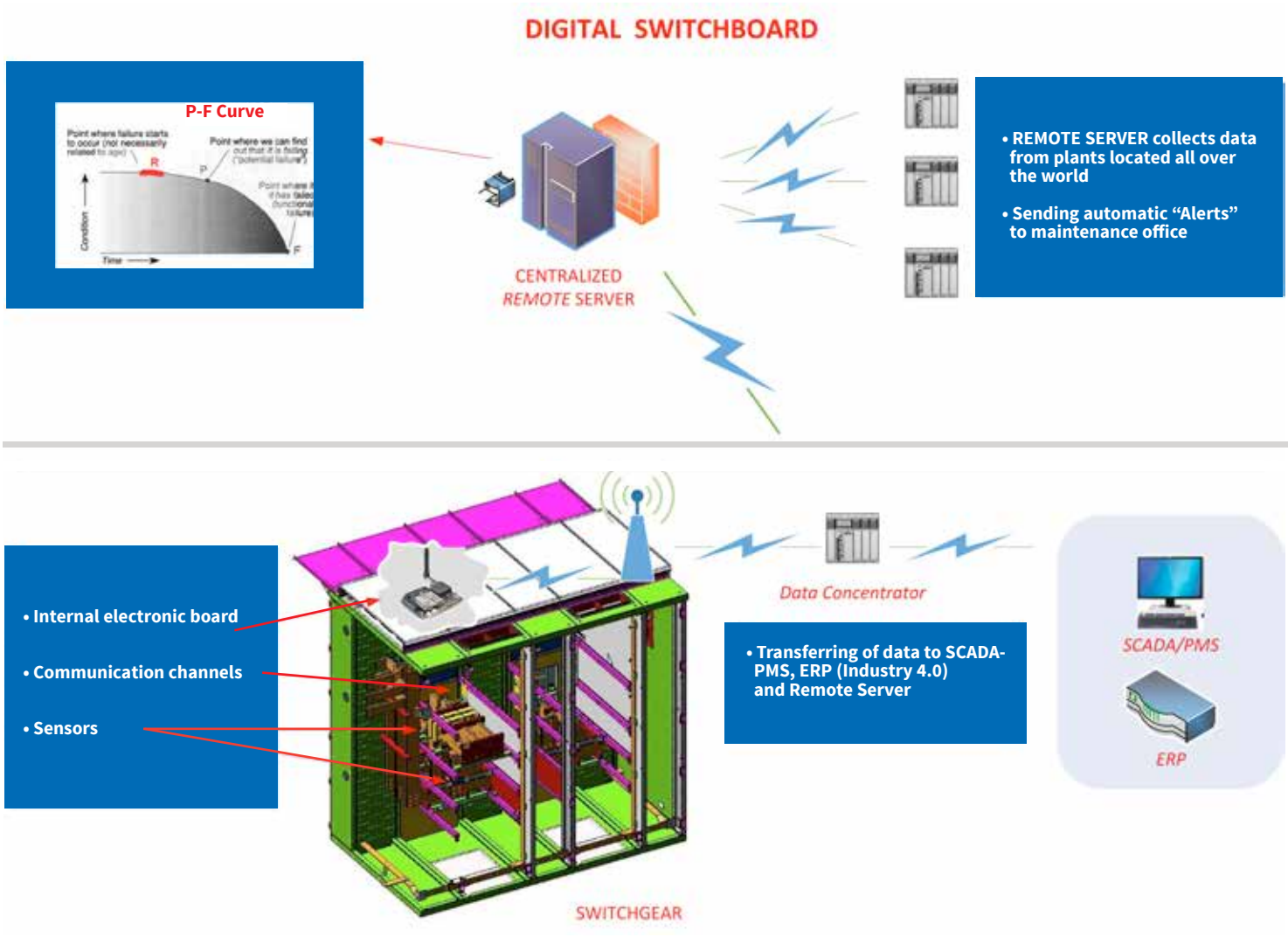
In case of shedding due to opening of Tie-Breaker, the priority matrices used by the PMS are the respective of configurations present after the Tie-Breaker opening. If Tie-Breaker/ interconnectors opens, then PMS will manage separately each sub matrix to detect the new network configuration. The feeders will be organized in real time dynamic group to be disconnected, singularly or in a combination, depending of the following parameters:

- priority index
- Tie-Breaker/interconnector status
- total power to be shed
- actual network configuration
- spinning reserve
- sudden load peak.

The group of loads shall be immediately disconnected as soon as the hardwired trip signals from the faulted generator is received. Other facility from PMS, in case of main separated busbars, is the changing of electrical network configuration, through Automatic Transfer System (ATS) in order to optimize the load balance for any busbar and minimize the Load shedding intervention. This calculus is performed in predictive way to recognize in real time the optimum electrical configuration to reduce Load shedding effect.

PRIORITY MATRIX			
BUS 1	BUS 2	BUS 3	BUS 4
load shedding index (0= no LS, 1 max priority.....25 min priority)	load shedding index (0= no LS, 1 max priority.....25 min priority)	load shedding index (0= no LS, 1 max priority.....25 min priority)	load shedding index (0= no LS, 1 max priority.....25 min priority)

Special Executions - Digital Switchboards



Smart switchboards

IMESA ceates digitalizated switchboards, complete with sensors and supervision monitoring system. These systems, whose software is completely implemented in IMESA, allow:

- the monitoring of the switchboards and systems;
- facilitated ordinary and extraordinary maintenance;
- the optimization of the storage of all data with connection to Supervision systems.

The switchboard includes pre-arrangement sensors (temperature, TA, TV) mechanically incorporated.

Via communication channels integrated in the carpentry the information from sensors are transmitted to internal electronic board for data acquisition and wireless transmission.

A Data concentrator collects data from switchboards and transfers the information to:

- Remote centralized server
- ERP system for INDUSTRY-4.0
- local Supervision (SCADA or PMS)

The REMOTE SERVER collects data from plants located all over the world.

The elaboration of a large amount of data allows for more detailed and reliable comparative analyzis.
Thanks to the predictive algorithms, service and maintenance activities are optimized by sending automatic «Alerts» to maintenance technicians.
Thanks to the combination of predictive algorithms and artificial intelligence (AI), the real fault zone, in the P-F curve of Moubray is identified.
All sub-parts are integrated in order to obtain a complete digitalized system.

Construction versions and Certificates

CONSTRUCTION VERSIONS
Redundant Fault Tolerant
- Hot standby
- SIL1
- SIL2
- SIL3

Navy application in compliance with standard
- RINA
- DNV
- ABS
- LLoyd Register

Military and Oil&Gas application

Executions for Tropicalized ambient

CERTIFICATES
The IMESA has certificates of conformity such as **ENEL, A2Aenergia and ACEA** approvals.
Futhermore, in compliance with the regulations in force **(IEC 622271-200)**, it has Test Reports of test (dielectric, short-circuit, short-tem, over-temperature, degree of protection, internal fault, etc.) carried out at different values.

CERTIFICATIONS
Automation integrated with IMESA equipment IMS6/P and IMS6/PM that have type conformity certification CESI to the ENEL DY806 or DY807 specifications based on the reference specification.

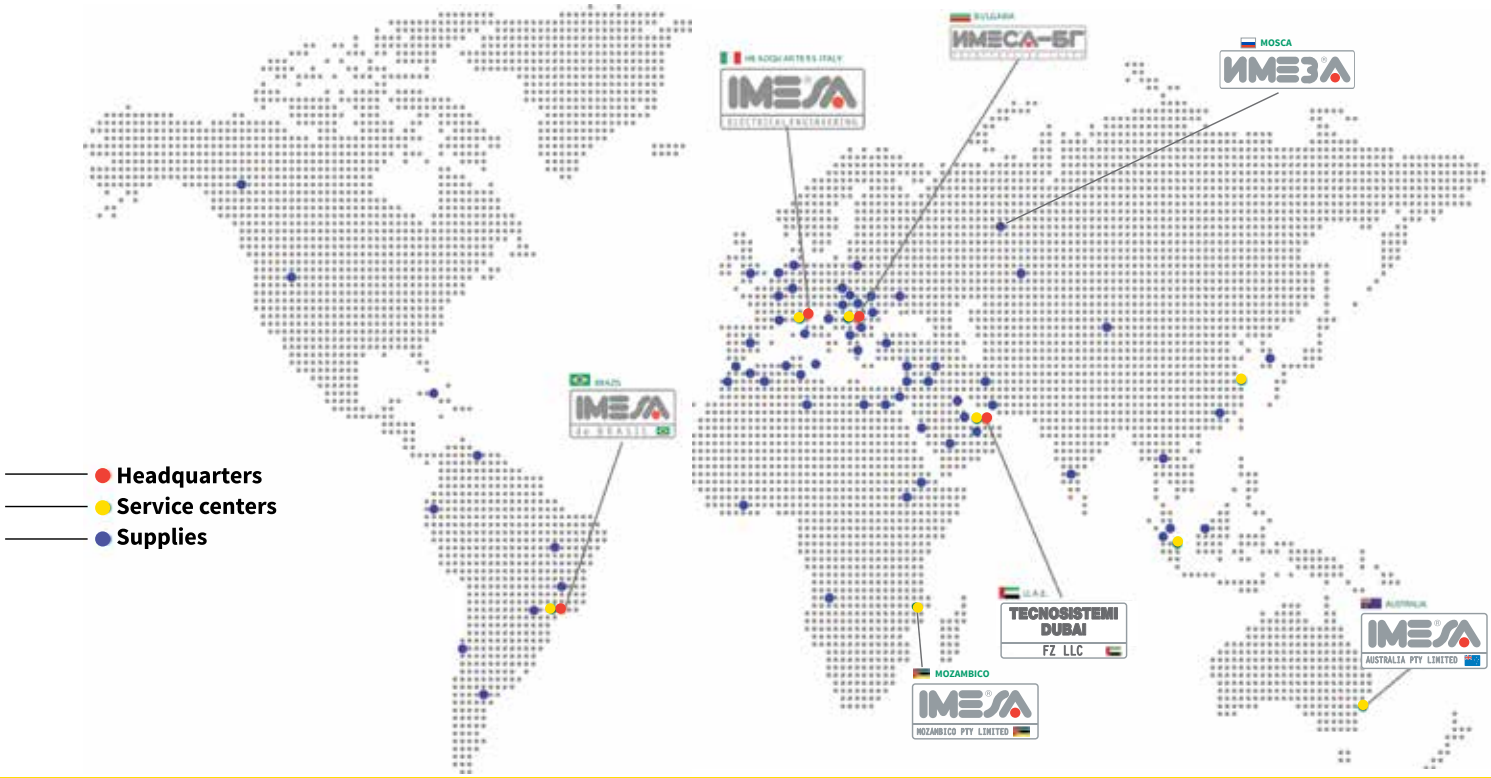
MEDIUM VOLTAGE COMPONENTS ON REQUEST FOR COMPLETION OF THE BASE UNIT
Medium voltage components in request for the completion of the base unit complete with integrated automation.
MS6 with independent operation
C1P with energy reserve
Motor drive (24Vdc)
TV for gearmotor power supply.

The Quality, Environment and Safety are IMESA's way of life

IMESA has certified its Management System in conformity to international standards **UNI EN ISO 9001, UNI EN ISO 14001, OHSAS 18001.**

IMESA's products are certified by the main shipping registers: **RINA (Registro Italiano Navale), Det Norske Veritas, Lloyd's Register of Shipping, American Bureau Shipping, Burea Veritas, Germanischer Lloyd, Russian Maritime Register of Shipping and Niipon Kaiji Kyokai.**

IMESA SpA World wide



IMESA Italia

IMESA S.p.A.
• Via G. di Vittorio 14, 60035 Jesi (AN)

MILANO
• Via Triulziana 18/H,
20097 San Donato Milanese (MI)

ROMA
• Via dei Bergamaschi 58, 00186 Roma (RM)

IMESA Services

CINA
• GCE GUANG CAI ELECTRIC - Pudong
Tel: (+86) 372 3159500

SINGAPORE
• Z-POWER AUTOMATION - Singapore
Tel: (+65) 6465 1925

IMESA World presence

IMESA BG
• Kuklensko Shose 21, 4004 Plovdiv, Bulgaria

IMESA DO BRASIL
• Rodovia RaposoTavares
Km 22, 140 06709-015 Cotia, São Paulo, Brasil

UFFICIO COMMERCIALE
TECNOSISTEMI FZ LLC
• Dubai Internet City
Office 119, Bld. 5 Dubai - U.A.E.

AUSTRALIA
• IMESA AUSTRALIA PTY LIMITED
Holding Redlich Level 65
MLC Centre, 19 Martin Place, Sydney NSW 2000

MOZAMBICO
• IMESA MOZAMBICO PTY LIMITADA
1230, Av. 25 de Setembro, 3rd floor block 5
Maputo - Mozambique

RUSSIA
• IMESA RUS
Nachimovskij Prospekt 52/57
117292 Moscow - Russia

How to reach IMESA SPA

How to reach IMESA SpA

By car:
Take the "Ancona Nord" exit on the A14 motorway and go onto the S.S.76 road towards Jesi; take the "Jesi Est" exit and follow the signs for the industrial estate - Zona Industriale ZIPA - Jesi (An).

Our premises are about 1 km from the exit on the S.S.76.

GPS Coordinates:
43° 31' 8" North,
13° 14' 4" East.

By train:
Jesi Station is 2 km from our premises.

By plane:
Ancona-Falconara Airport is 12 km from our premises.

To take account of any developments in Standards and materials, the characteristics and information on overall space required mentioned in this catalogue shall be considered binding only after confirmation from IMESA SpA.

IMESA MAIN REFERENCES

Client	Plant	Application	Description
QUINTO TRENO SCARL	Val D'Agri Oil ENI (2014 – 2016)	PMS / Electrical distribution	Supply, Commissioning and start-up of Power Management System, modification of existing Switchboards and load shedding system.
ELETTRA Srl	Oil Centre Val D'Agri ENI (2014 – 2016)	PMS / Electrical distribution	Supply, Commissioning and start-up of Electrical monitoring & Control system System (ECMS)
SAIPEM	OLT FRSU LIVORNO PROJECT (2009-2012) KARIMUN INDONESIA (2010) GNL-3Z PROJECT ARZEW ALGERIA (2009-2012)	PMS / Electrical distribution	Power management system, Electrical distribution monitoring And load shedding system of Gassifier off-Shore. Power management system, Electrical distribution monitoring And load shedding system of Distribution of the electrical network-rafinery. Electrical distribution control System. LV MCC motor feeders Management and control system And DCS interface.
ENI Spa	Val D'Agri Oil Centre ENI (2017 - 2018)	PMS / Electrical distribution	Load shedding system.
ENI-POWER SEF	Combinated heat-power plants-FERRARA E. / RAVENNA / MANTOVA / BRINDISI / FERRARA (2014-2017)	PMS / Electrical distribution	LV switchboards supervision and control system.
FORONI	Foroni Factory Of Gorla Minore (n.3 Industrial Furnaces) (2014)	Industry and Automation	Electrical and automation system.
FINCANTIERI	Val D'Agri Oil Centre ENI (2015)	Industry and Automation	Supervision Station, monitoring control, measurement and synchronization of the turbogenerator.
SAIPEM ABU DHABI BRANCH	Etihad Rail Project (ABU DHABI - 2013)	PMS / Electrical distribution	Distributed RTU system for Electrical line supervision.
SNAM RETE GAS	Terranuova Central	PMS / Electrical distribution	Electrical distribution supervision and control system.
FISIA ITALIMPIANTI	Desalination station (Jebel Ali – 2008)	PMS / Electrical distribution	Supervision and control system
TELESPAZIO Spa	Space Centre "Piero Fanti" – Fucino	PMS / Electrical distribution	Supply, installation and commissioning of supervision and control system

IMESA S.p.a.
Via G. di Vittorio, 14
Zona Industriale ZIPA
Jesi (AN) - Italy
Tel: (+39) 0731 211034
Fax: (+39) 0731 211055
www.imesaspa.com