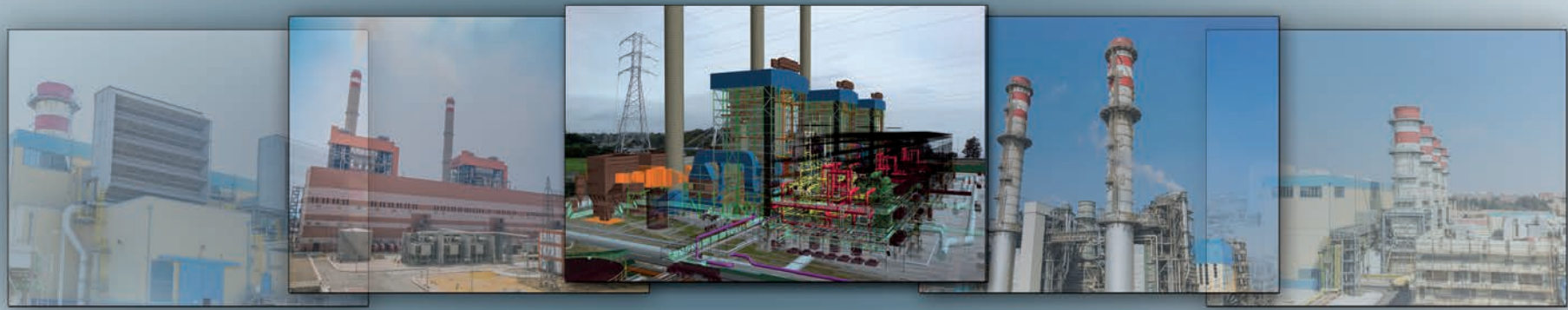


PGESCO

FUTURE@FINGERTIPS



SERVICES PORTFOLIO



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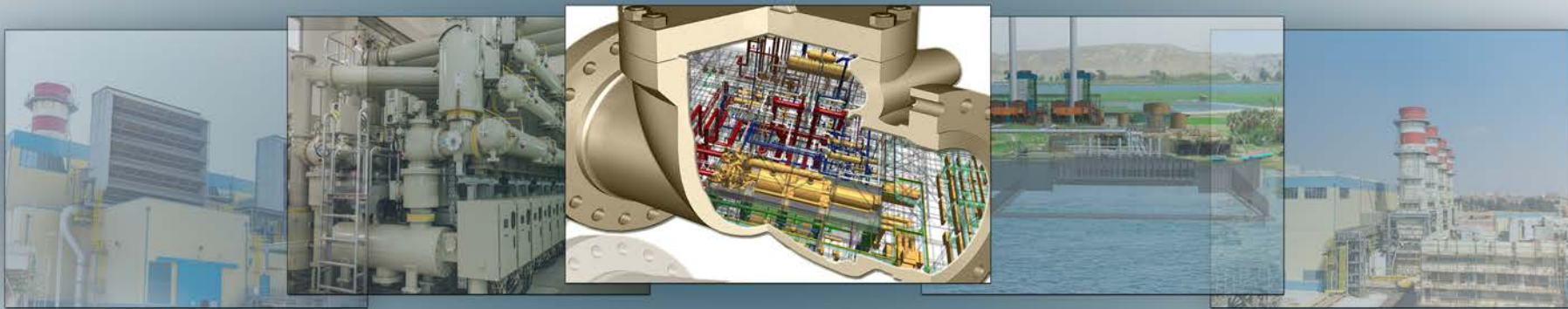
Prime Contracts & Procurement Services 39 - 45

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PGESCo Records

Since 1993, Power Generation Engineering and Services Company “PGESCo” has manifested proven capabilities by providing Innovative engineering solutions for energy projects and industrial sector in Egypt and MENA region.

With focus on delivering top quality and best services, PGESCo has engineered and managed sophisticated projects in challenging environments. From business planning up to operation and maintenance, PGESCo provides complete integrated services over the project’s life.

To ensure seamless digital exchange between organization functions, PGESCo develops and applies world advanced technology that provides the tools and environment needed to achieve its goals delivering quality projects that meet client expectations.

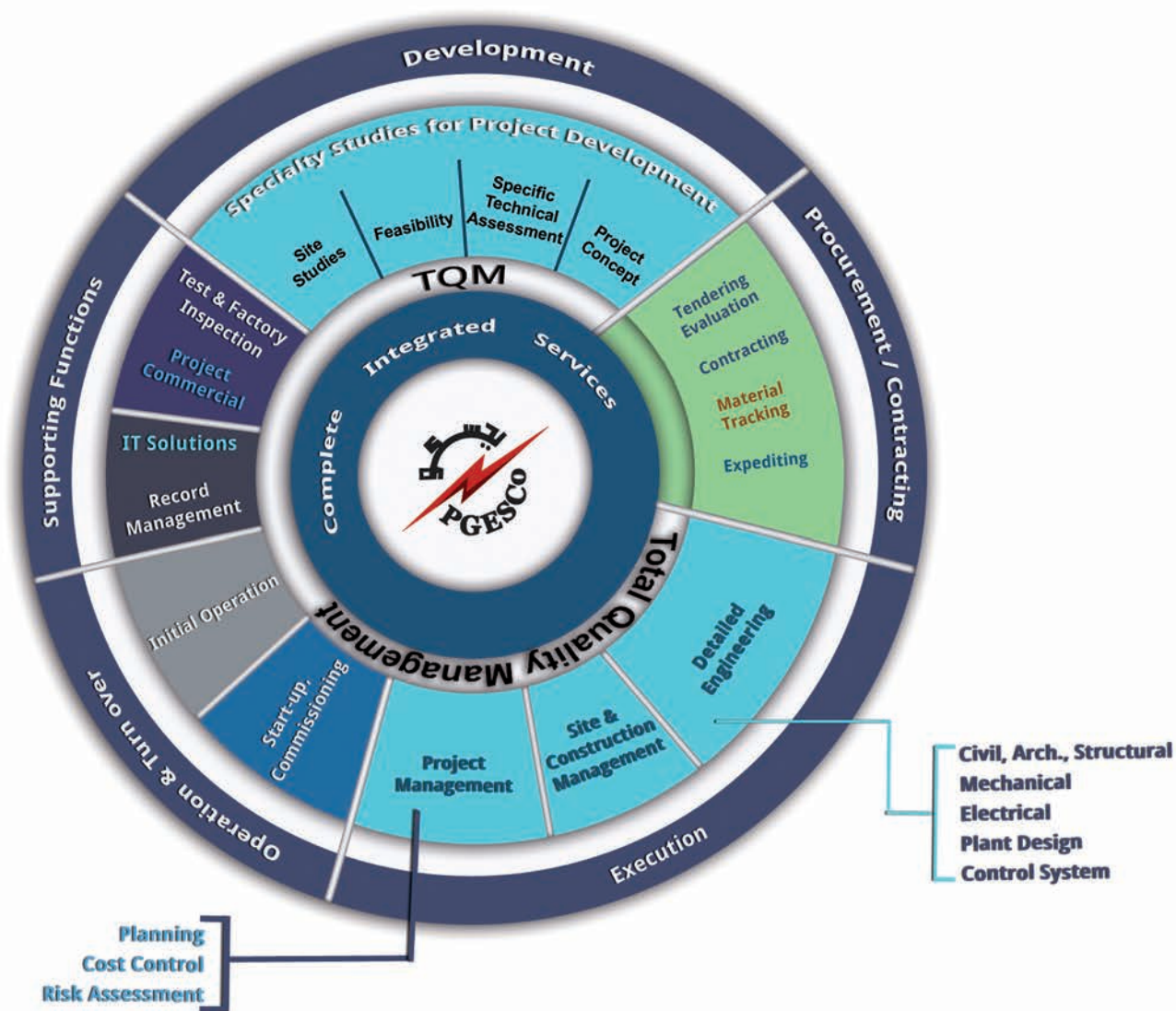
PGESCo provides services and support to the governmental utilities, EPC contractors, independent and private developers using State-of-the-Art design and communication technology platforms.



Engineering Design of



This Vast Experience Contributed Significantly to PGESCO's Understanding of Power & Industrial Projects Requirements, Especially in Engineering, Procurement, Construction Management Services (EPC/EPCM) as well as Project Management and Startup Management Services.



OFFERED SERVICES
COMPLETE INTEGRATED
PROJECT SERVICES



PGESCo ISO CERTIFICATES



Renewed ISO 9001:2015
PGESCo was the first runner in Africa, also
one of few pioneers around the world to have
ISO 9001:2015 certification



ISO 27001:2013



OHSAS 18001: 2007 ISO 14001: 2004





ENGINEERING SERVICES

PGESCo engineering provides innovative solutions in various fields of power generation and industry including conceptual, detailed and final engineering design for civil, mechanical, electrical, control system and communication systems Services.

PGESCo executes detailed engineering plans from licensing to vendor interfacing.

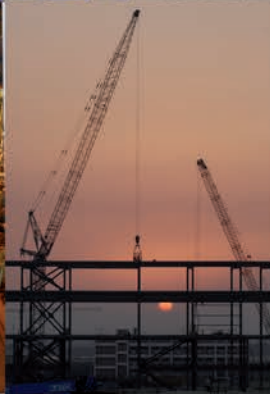
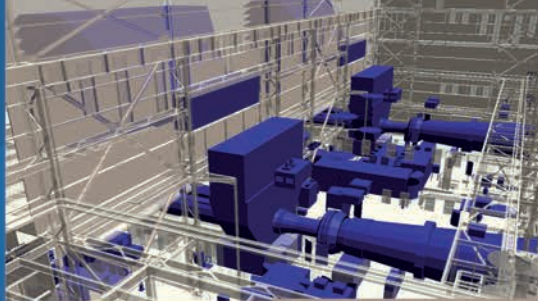
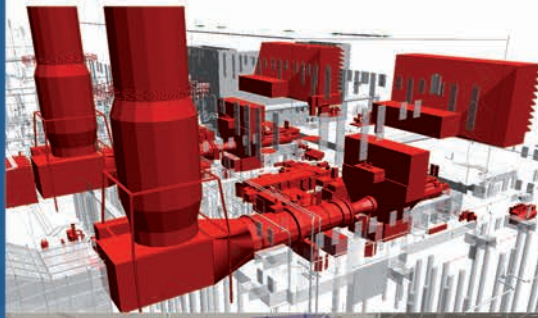
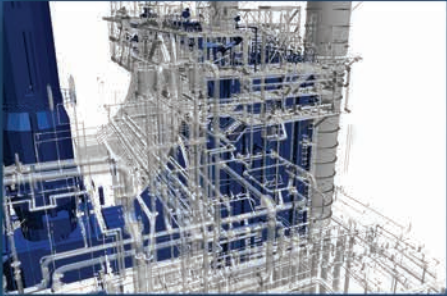
Our skills include structural steel design, foundations design such as large rotating equipment foundations design, architectural design, electrical engineering design, equipment management and process design, Piping Stress analysis, layout, load analysis and piping supports design.

Engineering activities of conceptual, detailed or final design are covered by our highly experienced team

- Architectural
- Civil / Structural
- Control Systems
- Electrical
- Mechanical
- Plant Design
- Engineering Quality Assurance & Quality Control
- Environmental
- Engineering Platform



ENGINEERING SERVICES OVERVIEW



PGESCO Engineering Typically Provides:

- . Technical Specification Preparation for each Equipment & Detailed Design
- . Pre-tender Clarifications
- . Technical Evaluation of Tenders
- . Pre-award Clarifications
- . Review of Contractors Technical Documents and Technical Coordination
- . Construction Support Services
- . Startup and Acceptance Testing Support
- . Plant Performance Tests
- . Training Services
- . Plant Data Book
- . Engineering Studies



NUBARIA COLONY

BUILDING CODE ANALYSIS:

- . Buildings Occupancy Classifications
- . Means of Emergency Exits
- . Life Safety Requirements



TEBBIN ADMINISTRATION BUILDING

FINISHING MATERIALS SPECIFICATIONS INCLUDING:

- . Multi-Project Standard Specifications
- . Project Technical Specifications
- . Design Criteria for Architectural Works



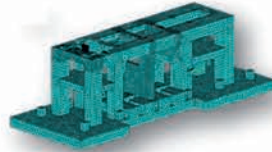
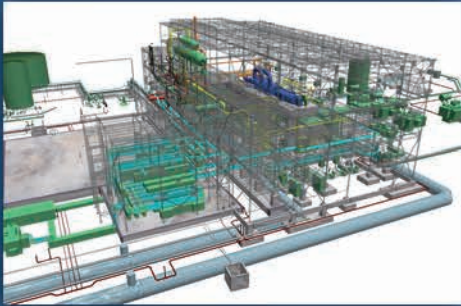
KUREIMAT ADMINISTRATION BUILDING

FULL RANGE OF ARCHITECTURAL DESIGN INCLUDING:

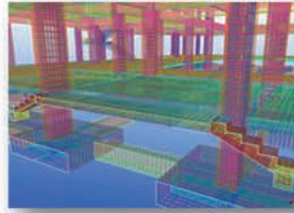
- . Power Plant / Buildings
- . Auxiliary Buildings
- . Ancillary Buildings and Colony

3D MODELING

CIVIL ENGINEERING SERVICES



Abu Qir Power Plant
Turbine pedestal
ANSYS FEA



Steel RFT & Workshop
Drawings
TEKLA structures



Intake Head
Offshore structure



Suez Power Plant
3D Modeling of Plant Civil
Commodities

Civil/Structural

- . Dynamic Analysis and Design of Machine Foundation and Complex Structures.
- . Analysis and Design of:
 - Steel Structures/Buildings.
 - Reinforced Concrete Structures and Foundation (Shallow and Deep Foundation).
- . Preparation of Technical Specifications, Tender Documents, Evaluation of Bidders, and Recommendation of Civil Related Award Contracts.
- . 3D Modeling of Civil-Commodities; including Steel Structures, Concrete Buildings, Rebar Detailing and Underground Circulating Water Piping.
- . Storm Drainage & Roads Design.

Geotechnical

- . Onshore/offshore Soil Investigation and Geophysics.
- . Geotechnical Analysis and Design.
- . Seismic Hazard Assessment & Analysis.
- . Topographic Survey and Underground Detection.

Hydraulic Works

- . Hydrographic Survey, Hydraulic Modelling.
- . Design of Circulating Water System (Onshore/Offshore).

CONTROL SYSTEMS ENGINEERING SERVICES

Automation and Control Design

Distributed Control System (DCS) Specification

Control Systems Architectural Drawing

DCS Sizing and I/O Assignment

Logic Diagrams (Plant Protection, Function Block, and Digital Logic)

Set Point Index

Factory Acceptance Test (FAT)

Instrumentation and Analysis Design

Instrument Selection.

Instrument Data Sheets

Control Valve Data Sheets

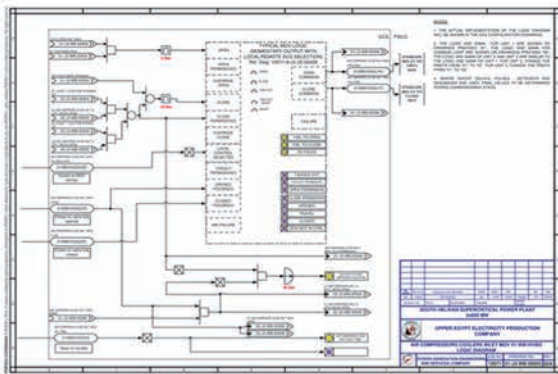
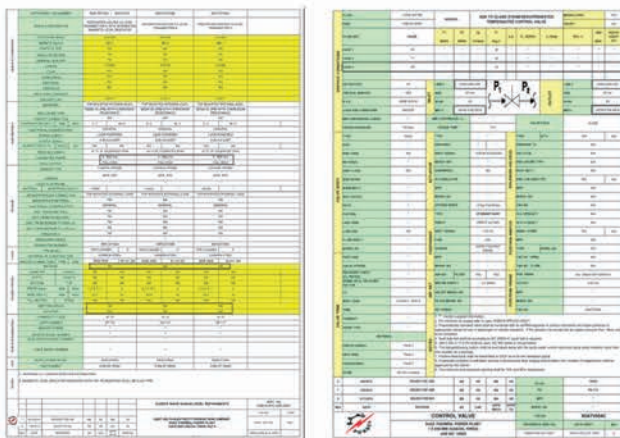
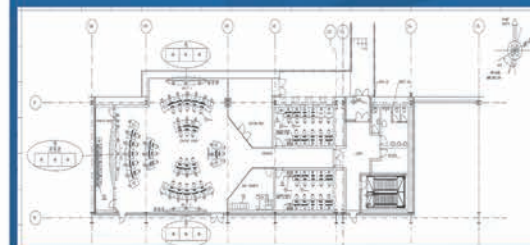
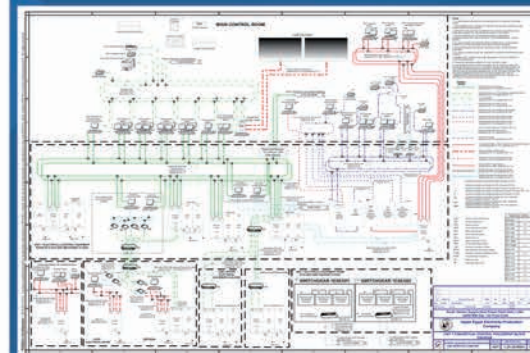
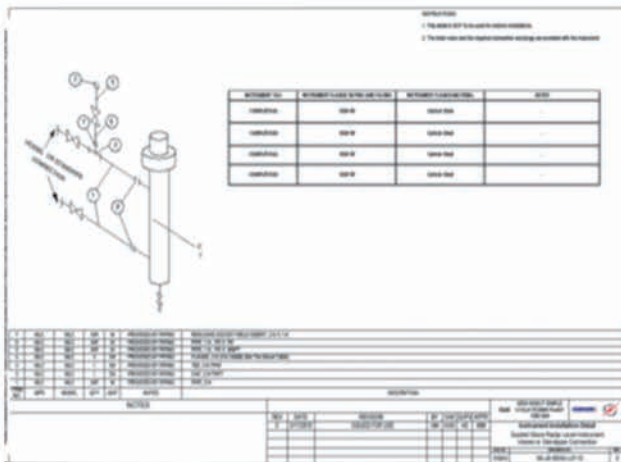
Control Valve Sizing and Selection

Instrument Location Plans

Instrument Installation Details (IID)

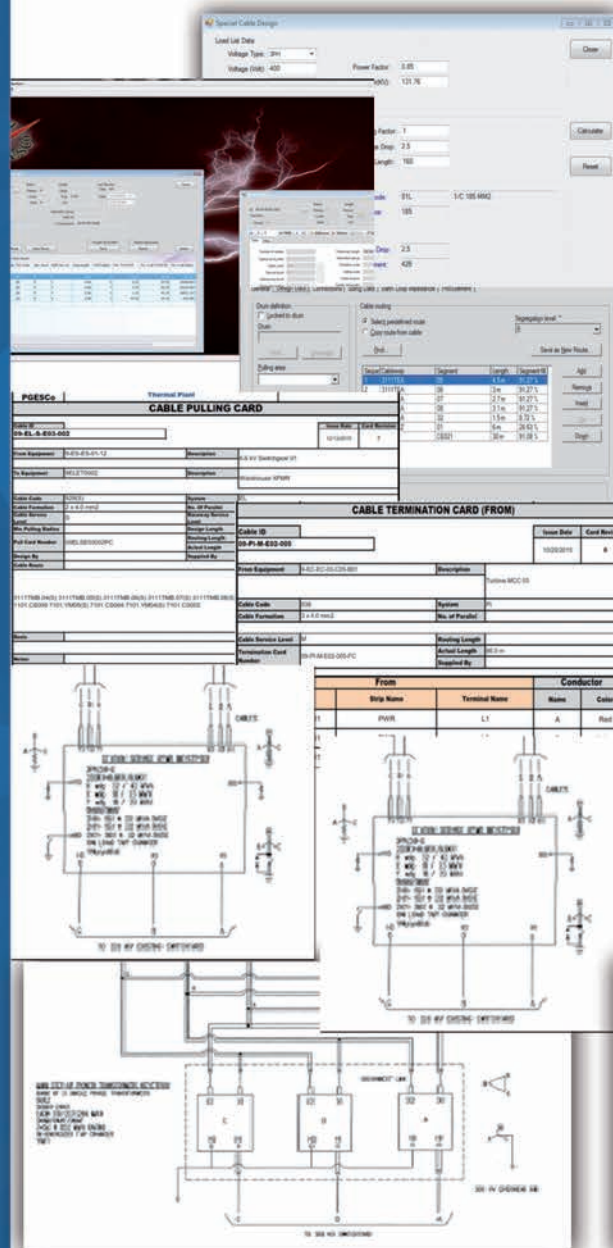
Continuous Emissions Monitoring System (CEMS)

Steam & Water Analysis System (SWAS)



ELECTRICAL ENGINEERING SERVICES

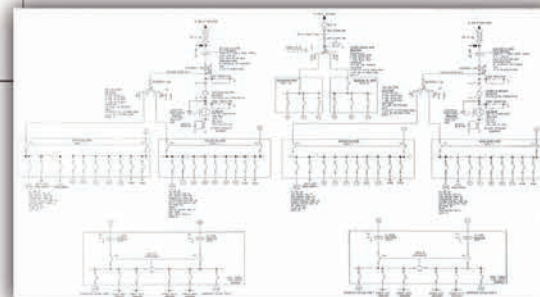


Single-line and Phasing Diagrams

- Main Plant Electrical Distribution System (Single-Line Diagrams)
- Plant Phasing Diagrams

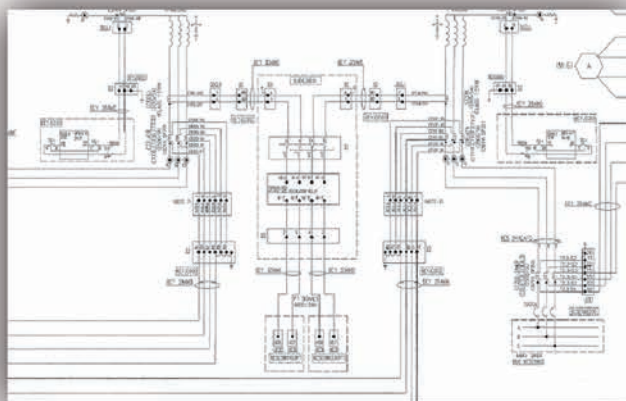
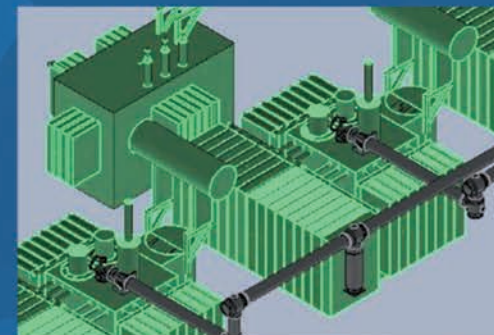
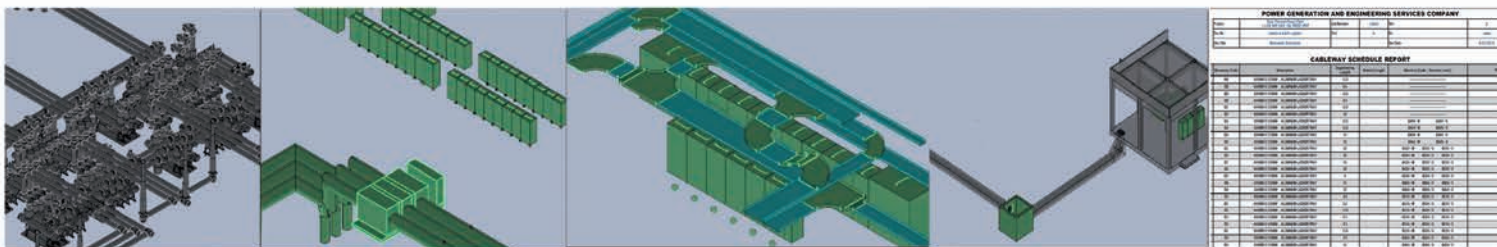
Plant Cabling

- Cable Design that Includes Cable Type and Size Selection Using PGESCO Proprietary Software.
- Cable Routing that Includes Cable Pathway Selection, Cable Filling and Length Calculations, and Cable Pulling Cards Using Both PGESCO Proprietary and International Software.
- Cable Termination that Includes Cable Termination cards.
- Cable MTOs and Material Tracking that Includes: Cable Quantities Estimation and MTOs, Cable Installation Follow-Up and Material Tracking.



- Plant Metering and Relaying Single-Line Diagrams
- Plant Protection Three-Line Diagrams

ELECTRICAL ENGINEERING SERVICES



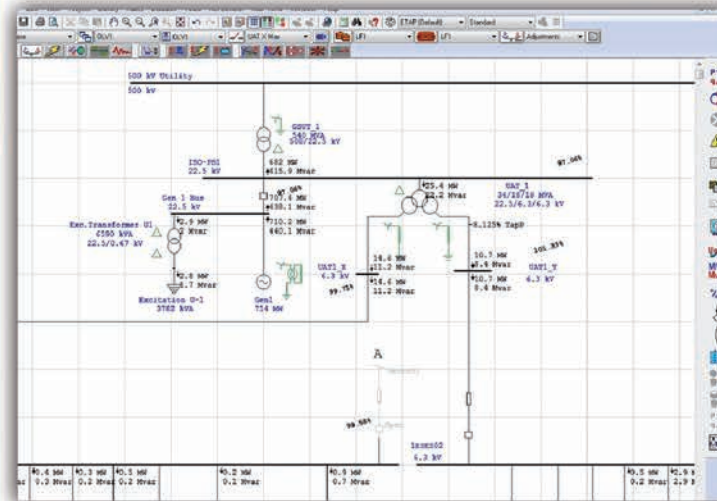
Equipment Modeling, Layout Drawings and Raceway System Design

- Equipment Layout Drawings
- Raceway System Design

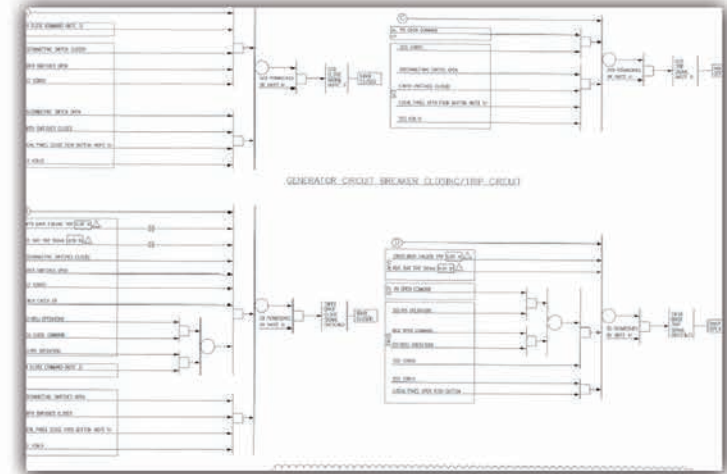
ELECTRICAL ENGINEERING SERVICES

Breaker Logic Diagrams Power System Studies

- Short Circuit Calculations
- Load Flow
- Motor Start Simulations

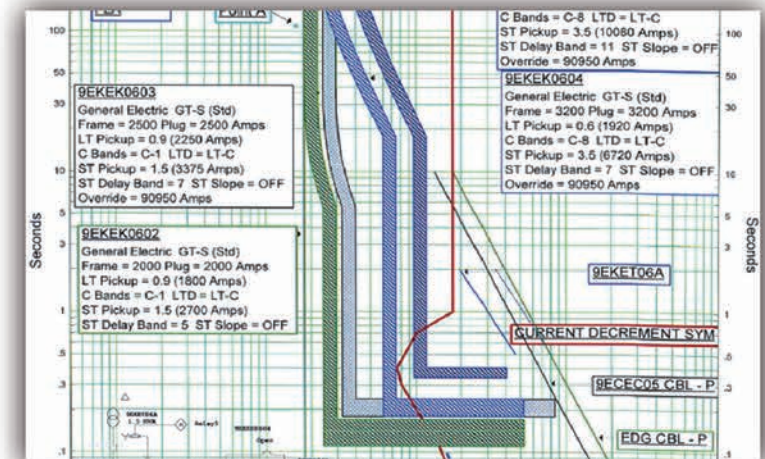


Protection Setting and Relay Coordination Study



Electrical Equipment Sizing and Specification

Sizing and Specification for the Following:
MV and LV Switchgear, Plant Power and LV Transformers, DC and UPS Equipment, Grounding System, Switchyard Equipment and Systems, Generator Circuit Breaker, and Isolated Phase Bus Duct



Mechanical discipline is responsible for the process design and equipment specifications. The discipline has its distinguished expertise in all types of systems and mechanical equipment. Through its crew of mechanical specialists, PGESCO can cover any mechanical Engineering need that may arise.

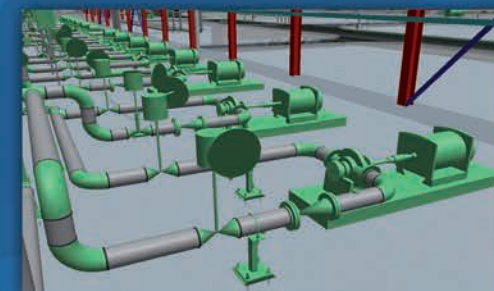
MECHANICAL ENGINEERING SERVICES

Discipline maintains a long list of projects Design Documents, Studies and Drawings:

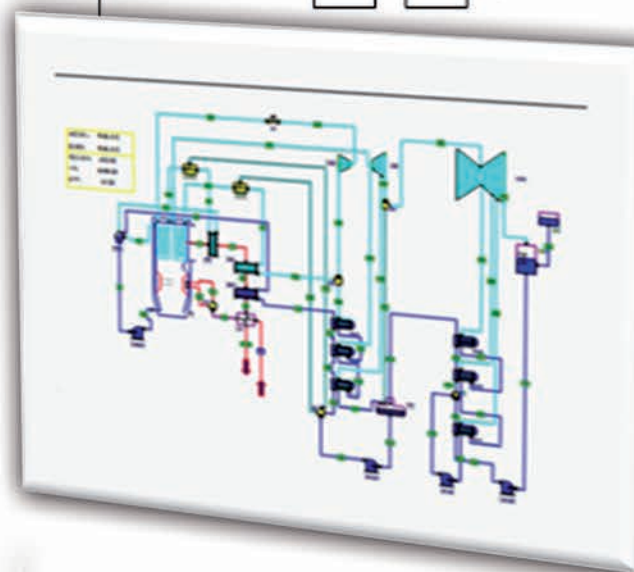
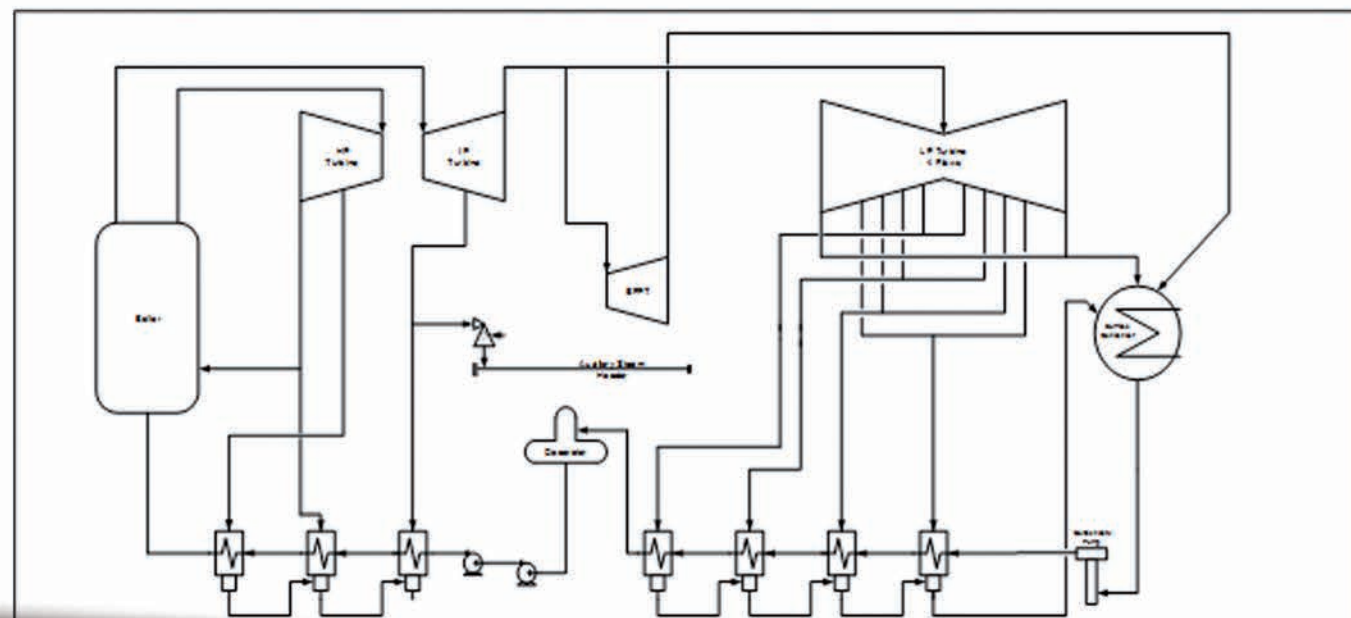
- . Power Plant heat & Mass Balance Conceptual Design
- . Preliminary Design Report
- . Process piping and Instrument diagrams P&IDs
- . Pipe List, Valve List, Equipment List and Specialty List
- . Detail systems design calculation including piping and mechanical sizing
- . Equipment technical specifications
- . Bidders Evaluation Report

MECHANICAL ENGINEERING TECHNICAL SPECIALISTS

- . Fired Heat Transfer Equipment (Boiler/HRSG)
- . Unfired Heat Transfer Equipment (Deaerator/Feedwater Heaters/Heat Exchanger)
- . Rotating Equipment (Compressors/Pumps)
- . Performance Test
- . Firefighting/HVAC
- . Water Treatment Group
- . Environment
- . Heat and Mass Balance



Power Plant heat & Mass Balance Conceptual design



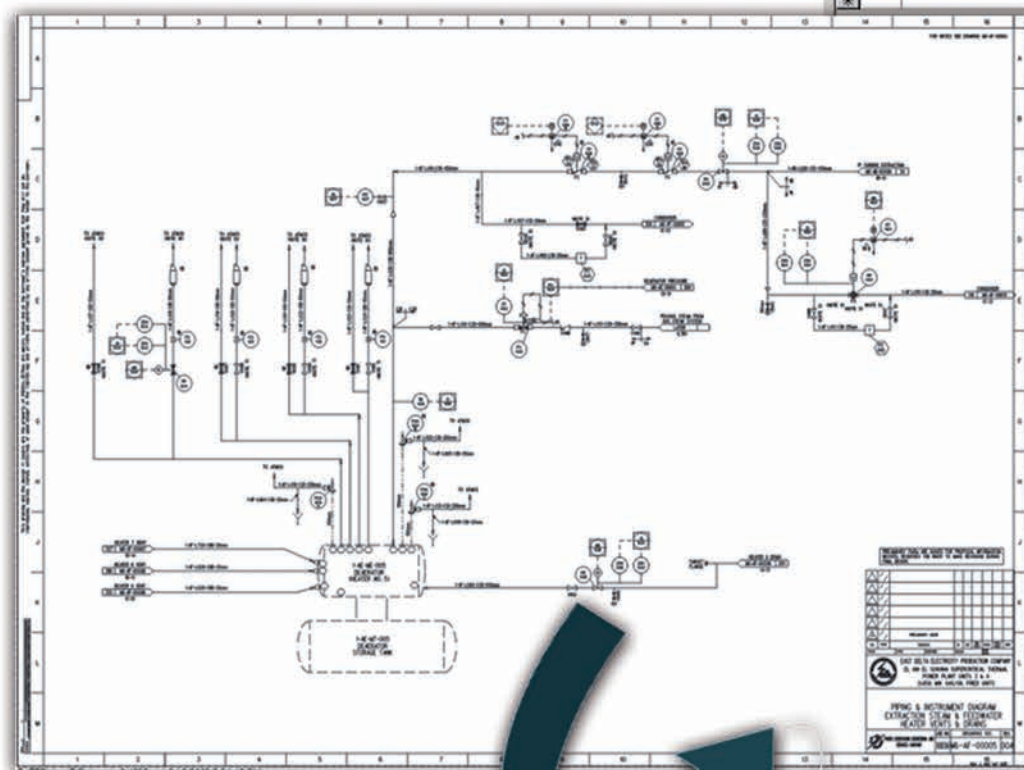
C		Praktikum			
Ran.	Dat.	Coursework	Ry	Eng	for
Power Generation Engineering and Send Gas Company PENGAS					
Upper Epy Electricity Product on Company					
Hehan South Super of Coal Power Plant 2 x 600 MW					
Plant Raw Diagram					
Eng. No.	102711-102-2022-04-2021			Marked	C

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Intelligent Piping & Instrument Program



Through its Intelligent Modelling Platform that is Fully Integrated, PGESCO can Guarantee the Accuracy of all Delivered Lists



Custom View Wizard

View Properties - select the columns to view and how they will be viewed.

Order	Field Name	Field Label	Group By
1	MATERIAL_SPEC_LINE	Material Class	Group By
2	NOMINAL_DIAMETER	Diameter	Group By
3	DESIGN_TEMPERATURE	Max DTemp	Maximum
4	DESIGN_PRESSURE	Max DPress	Maximum

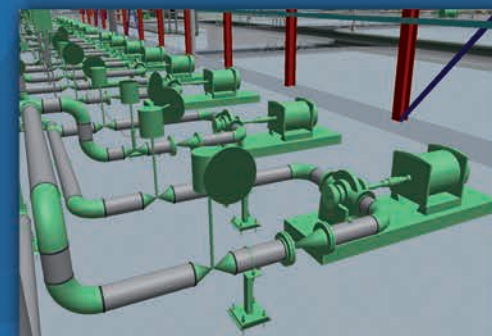
Options: Clear, Add All, Delete Row

Cancel < Back Next > Finish

Piping Class MaxDT,DP

Material Class	Diameter	Max DTemp	Max DPress
150	4	120	10
210	3	120	60
360	8	1065	190
360	20	1065	645
360	2	1065	710
360	4	200	2020
360	6	1065	2020
360	10	1065	2020
360	12	1065	2020
360	16	1065	710
360	0.5	630	50
360	0.75	630	50
360	1	800	50
360	1.5	775	50
360	2	630	50
360	3	630	50
360	4	630	600
360	6	630	600
360	8	775	50
360	10	125	60
360	12	659	50
360	14	125	125
360	16	140	50

MECHANICAL ENGINEERING SERVICES





MECHANICAL ENGINEERING SERVICES

Pipe List, Valve List, Equipment List and Specialty List

CAIRO WEST THERMAL POWER PLANT UNIT 7&8
2X350 MW GAS/OIL FIRED UNITS
Mechanical Specialty List

10051-9-MEX-YA-00005

Tag Number	Line Tag No	Specialty Description	Contract Specification	P&ID	Working P&ID Rev	Remarks	List Rev.
7-AB-PY-001	7-AB-L04B-C90-25mm	Y strainer	CP-118	7-M6-AB-00001	B		0
7-AB-PY-002	7-AB-L04B-C90-25mm	Screen trap	CP-118	7-M6-AB-00001	B		0
7-AB-PY-003	7-AB-L024-46D-25mm	Y strainer	CP-118	7-M6-AB-00001	B		0

CAIRO WEST THERMAL POWER PLANT
UNIT 7&8
2X350 MW GAS/OIL FIRED UNITS
Mechanical Equipment List

SPECIFICATION 10051-9-MEX-YA-00005

TAG	REV	UNIT	DESCRIPTION	QUANTITY	CP NO	SPEC NO	PID	P&ID REV	REMARKS	LIST REV
7-AB-PY-001	0	7	Y STRAINER	1	CP-118	7-M6-AB-00001	7-M6-AB-00001	B		0
7-AB-PY-002	0	7	SCREEN TRAP	1	CP-118	7-M6-AB-00001	7-M6-AB-00001	B		0
7-AB-PY-003	0	7	Y STRAINER	1	CP-118	7-M6-AB-00001	7-M6-AB-00001	B		0

CAIRO WEST THERMAL POWER PLANT
UNIT 7&8
2X350 MW GAS/OIL FIRED UNITS
Mechanical Equipment List

10051-9-MEX-YA-00005

Tag Number	Rev	Unit	Line Tag	Design Pressure (bar)	Service Pressure (bar)	Design Temp. (°C)	Service Temp. (°C)	Heat Temp. (°C)	Leak Service	Insulation	Ins. Mat.	Ins. Thk. (mm)	Remarks	List Rev.
7-AB-L001	0	7	7-AB-L001-9.4-70mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L002	0	7	7-AB-L002-9.4-40mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L003	0	7	7-AB-L003-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L004	0	7	7-AB-L004-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L005	0	7	7-AB-L005-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L006	0	7	7-AB-L006-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L007	0	7	7-AB-L007-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L008	0	7	7-AB-L008-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L009	0	7	7-AB-L009-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L010	0	7	7-AB-L010-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L011	0	7	7-AB-L011-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L012	0	7	7-AB-L012-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L013	0	7	7-AB-L013-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L014	0	7	7-AB-L014-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L015	0	7	7-AB-L015-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L016	0	7	7-AB-L016-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L017	0	7	7-AB-L017-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L018	0	7	7-AB-L018-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L019	0	7	7-AB-L019-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L020	0	7	7-AB-L020-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L021	0	7	7-AB-L021-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L022	0	7	7-AB-L022-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L023	0	7	7-AB-L023-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L024	0	7	7-AB-L024-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L025	0	7	7-AB-L025-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L026	0	7	7-AB-L026-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L027	0	7	7-AB-L027-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L028	0	7	7-AB-L028-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L029	0	7	7-AB-L029-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L030	0	7	7-AB-L030-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L031	0	7	7-AB-L031-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L032	0	7	7-AB-L032-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L033	0	7	7-AB-L033-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L034	0	7	7-AB-L034-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L035	0	7	7-AB-L035-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L036	0	7	7-AB-L036-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L037	0	7	7-AB-L037-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L038	0	7	7-AB-L038-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L039	0	7	7-AB-L039-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L040	0	7	7-AB-L040-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L041	0	7	7-AB-L041-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L042	0	7	7-AB-L042-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L043	0	7	7-AB-L043-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L044	0	7	7-AB-L044-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L045	0	7	7-AB-L045-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L046	0	7	7-AB-L046-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L047	0	7	7-AB-L047-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L048	0	7	7-AB-L048-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L049	0	7	7-AB-L049-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L050	0	7	7-AB-L050-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L051	0	7	7-AB-L051-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
7-AB-L052	0	7	7-AB-L052-9.4-25mm	18.1	18.1	547	541	NT	Y	MMW	140			0
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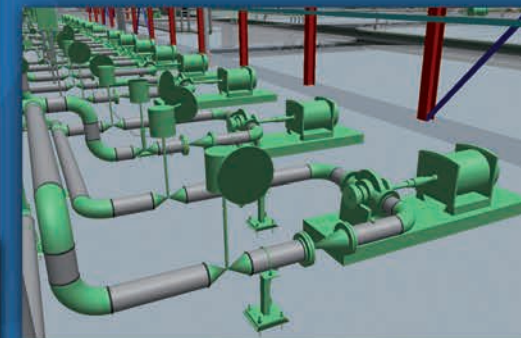
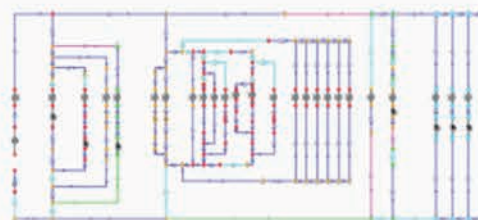
Detail systems design calculation including piping and mechanical sizing

Right tools and long deliberating and checking process that guarantee accurate results and optimized designs

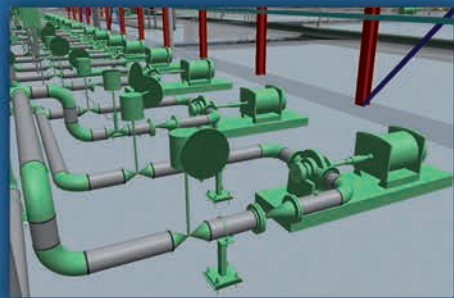
MECHANICAL ENGINEERING SERVICES

CALCULATION COVER SHEET															
PROJECT	Huizen Supercritical Power Plant	JOB NO.	HCPT	CALC NO.	8-MSC-AP-0002	SHEET	1 OF 3								
CALCULATION STATUS	PRELIMINARY	CONFIRMED with PRELIMINARY CALCULATION	CONFIRMED	SUPERSEDED	VOIDED										
SUBJECT	Pressure Steam Lines Sizing and Pressure Drop Calculations														
COMPUTER PROGRAM TYPE	SCP	PROGRAM NO.	PPNET	VERSION/RELEASE	1.7	OPERATING SYSTEM	Windows 7								
<p>Appendices</p> <p>Appendix A: Selection Steam Lines pressure Drop Power 1.7 output report</p> <p>ATTACHMENTS</p> <ol style="list-style-type: none"> 1. MHI Heat Source Diagram; 2. Recommended fluid velocity chart, 1000-MHI-0001 Rev D; 3. Header vents and drain system P&ID 10071-1-MB-AF-00008, 10071-1-MB-AF-00004, 10071-1-MB-AF-00005, 10071-1-MB-AF-00006, 10071-1-MB-AF-00007 and 10071-1-MB-AF-00008 4. AF system start line drawing 5. Cold to hot steam system P&ID 10071-1-MB-AB-00005 and 10071-1-MB-AB-00004 6. Heat balance diagram for heater out of service cases 															
<p>Without attachments</p> <table border="1"> <thead> <tr> <th>REV. NO.</th> <th>REASON FOR REVISION</th> <th>TOTAL NO. OF SHEETS</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>Issued for Review</td> <td>5</td> <td>11/6/2014</td> </tr> </tbody> </table> <p>RECORD OF REVISIONS</p>								REV. NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	DATE	A	Issued for Review	5	11/6/2014
REV. NO.	REASON FOR REVISION	TOTAL NO. OF SHEETS	DATE												
A	Issued for Review	5	11/6/2014												

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MECHANICAL ENGINEERING SERVICES



Equipment technical specifications

PGESCO specifications have been refined and optimized based on tens of projects installations and years of operations

TECHNICAL SPECIFICATION
10051-9-3PS-MUSG-00001



FOR
STEAM TURBINE GENERATOR(S)
AND
AUXILIARIES
FOR
CAIRO ELECTRICITY PRODUCTION COMPANY
CAIRO WEST THERMAL POWER PLANT
UNITS 7 & 8
2X350 MW GAS/OIL FIRED UNITS

POWER GENERATION ENGINEERING AND SERVICES COMPANY (PGESCO)
CAIRO, EGYPT

NO.	DATE	REVISIONS	BY	CHK'D	APPROVALS
A	9/13/06	Issued for Review	SM	MM	MM
B	11/1/06	Issued for Bank Review	MM	SH	PM

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TECHNICAL SPECIFICATION
10049-9-3PS-MBPR-00001

FOR
HEAT RECOVERY STEAM GENERATOR(S)
FOR
WEST DELTA ELECTRICITY PRODUCTION COMPANY
NUBARIA POWER STATION III
750 MW (NOMINAL) COMBINED CYCLE PROJECT

POWER GENERATION ENGINEERING AND SERVICES COMPANY (PGESCO)
CAIRO, EGYPT

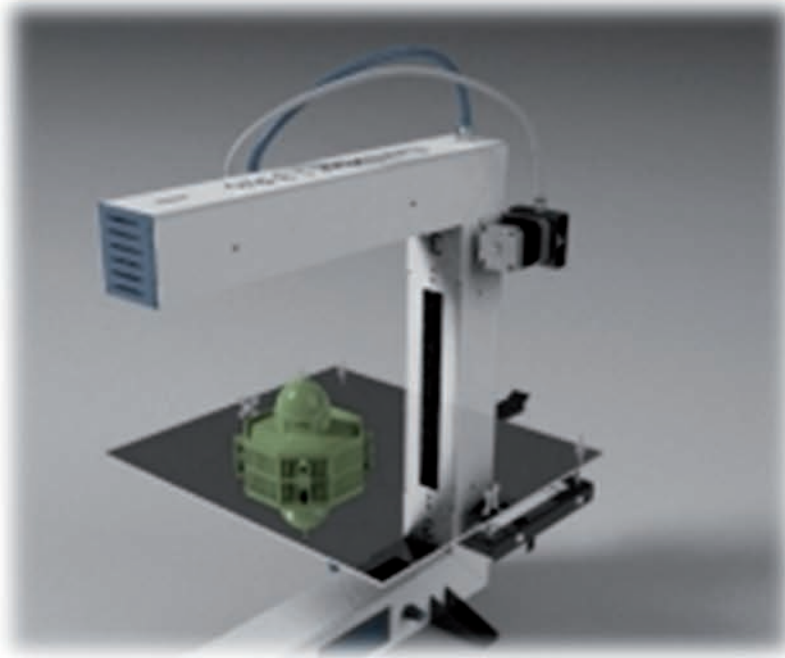
NO.	DATE	REVISION	BY	CHK'D	APPROVAL
0	9/4/06	ISSUED FOR BIDS	MF	SS	SS EA

PGESCO Confidential

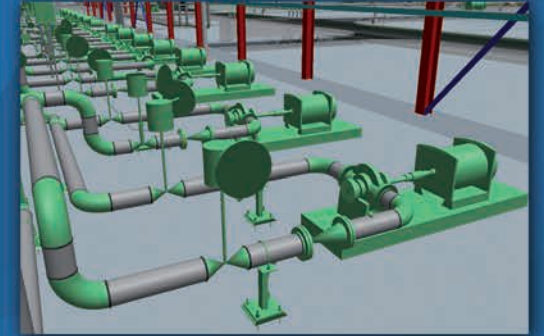
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MECHANICAL ENGINEERING TECHNICAL SPECIALISTS

- . Fired Heat Transfer Equipment (Boiler/HRSG).
- . Unfired Heat Transfer Equipment .
(Deaerator/Feedwater Heaters/Heat Exchanger).
- . Rotating Equipment (Compressors/Pumps).
- . Performance Test.
- . Firefighting/HVAC.
- . Water Treatment Group.
- . Environment.
- . Heat and Mass Balance.

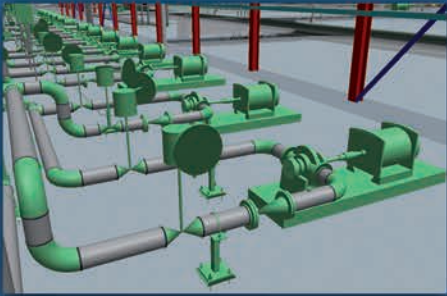


MECHANICAL ENGINEERING SERVICES





MECHANICAL ENGINEERING SERVICES



Unfired Heat Transfer Equipment (Deaerator/Feedwater Heaters/Heat Exchanger)

- . Refine and Optimize Specifications for Unfired Heat Transfer Equipment
- . Review Heat Exchanger Detail Design
- . Review Deaerator Transient Condition Calculation
- . Support Projects Engineers to Review any Technical Issues Related to Unfired Equipment.
- . Prepare Study/Report for Technical Issue.
- . Support Projects During Pre-Award Meeting and Other Technical Meeting
- . Prepare and Issue Design Guide

Fired Heat Transfer Equipment (Boiler/HRSG)

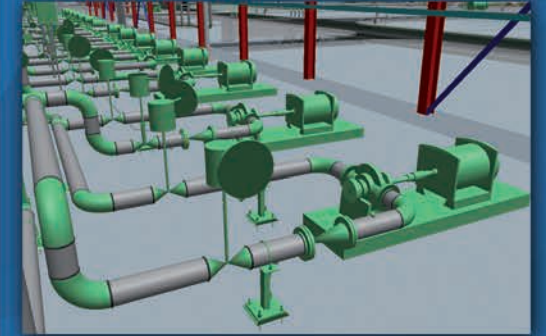
- . Continuously Refine and Optimize Boiler/HRSG Specifications Based on Actual Operation Experience and Continuous Discussions With all the Leading Suppliers.
- . Review the Detail Design of Boilers Components and Systems, Including Air System, Fuel System, Burner Design, Soot Blowing Design and Heat Transfer Section Design.
- . Prepare Studies for Technical Issue Whether During Detail Design or Upon Request for Support from PGESCo Clients.
- . Work with Projects to Evaluate Proposals, Prepare and Negotiate the Technical Aspects of the Contracts
- . Prepare and Maintain Design Guides

Performance Test Group

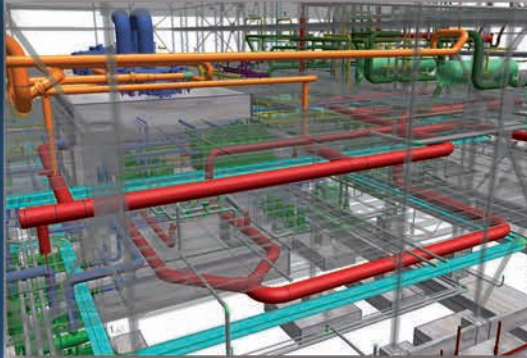
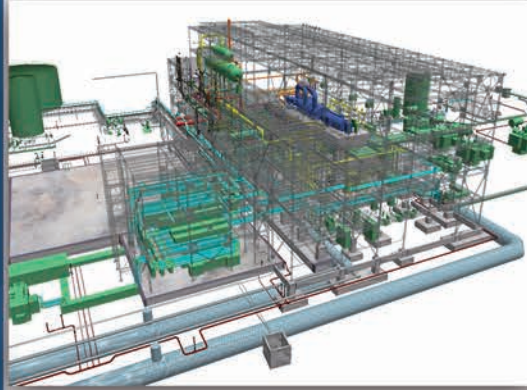
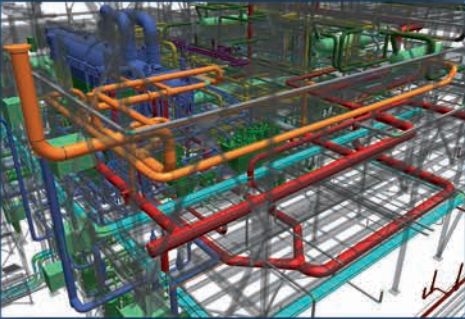
- Prepare Plant Performance Test Protocol Using ASME PTC or Other International Codes.
- Review Performance Test procedure Provided by Contractor.
- Witness units Performance Test.
- Analyze Output Data.
- Prepare and Issue Reports.

Firefighting/HVAC

- Refine and optimize Firefighting/HVAC specifications.
- Establish design basis for HVAC system.
- Detail design of plant wide Firefighting/HVAC.
- Review contractor submittals for Firefighting/HVAC.



PLANT DESIGN



PIPING & VALVES SPECIALITY

- . Issue Piping Material Classes.
- . Prepare Specifications and Material Requisitions for Piping, Valves, and other in-line Components, e.g., Expansion Joints, Traps, Strainers, etc.
- . Prepare Pipe Fabrication and Installation Specifications.
- . Prepare Pipe Insulation Specification.
- . Material Selection for Piping and Valves.

EQUIPMENT & PIPE LAYOUT DESIGN

- . Site layout Optimization.
- . 3D Modeling of Mechanical Equipment and Major Plant Commodities.
- . Design and Routing of Different Plant Piping Systems.
- . 3D Modeling of Piping, Fittings, Valves, Special Devices etc.
- . Ownership of Plant 3D Model and Exchange it with Contractors Models.
- . Run Model Review and Interference Checking of PGESCO Design and Contractors Commodities.

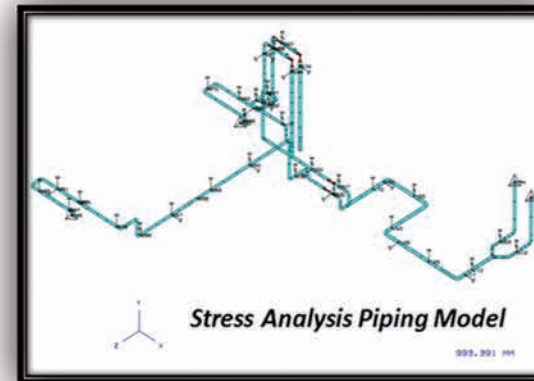
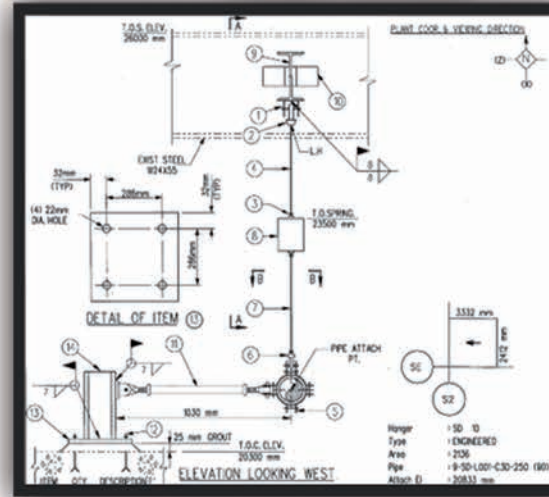
STRESS ANALYSIS

- Perform Computer Stress Analysis of Piping Systems Including:
Weight, Thermal, Wind, Seismic, Time History (Steam Hammer), Dynamic Loadings, and Provide Support Loads and Locations to the Pipe Support Group .
- Perform Transient Analysis .

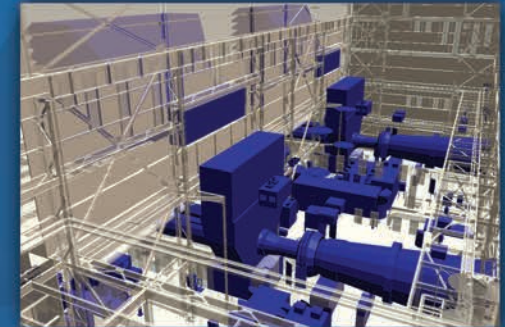
PIPE SUPPORT DESIGN

- Prepare Specifications for Fabrication and Installation of Pipe Supports.
- Prepare Requisitions for Procurement of Pipe Supports.
- Select Feasible Support Locations for Analyzed Systems.
- Select Support Locations and Type for Non-analyzed Systems.
- Pipe Support Design.
- 3D Modeling of Pipe Supports & Hangers.
- Analyzing Engineered Pipe Supports.

PIPING SUPPORT

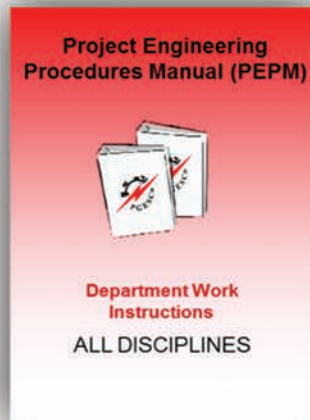
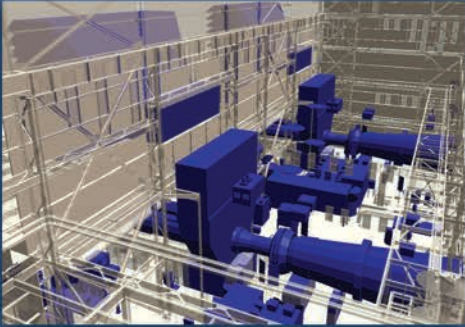


PLANT DESIGN





ENGINEERING QUALITY ASSURANCE & QUALITY



Quality Assurance

Quality Control



QUALITY ASSURANCE

- . Engineering Procedures & Instructions “EDPs, SEIs, GEIs & WPDs”.
- . Codes & Standards.
- . Standard Technical Specifications.
- . Continuous Training and Development of Engineers.
- . Audits Planning “internal & external”.
- . Risk Analysis & Assessment.
- . Documents and Records Numbering System.
- . Lessons Learned.

QUALITY CONTROL

- . Design Checklists
- . Documents & Drawings Register.
- . Calculation Register.
- . 3D Model Review Meeting.
- . Design Checkers.
- . Design Review Notice “DRNs”.
- . Coordination Forms.
- . Standard Drawings.
- . Standard Forms.
- . Risk Register.

ENVIRONMENTAL

- **Technical Specifications.**
- **Develop Project Environmental Impact Assessment.**
- **Coordinating and Managing Environmental Activities Between Financing Agencies such as the World Bank, African Development Bank and Client.**
- **Developing and Maintaining Environmental Monitoring and due Diligence Programs for Air, Surface & Groundwater, Noise, Traffic, Soil and Social Conditions.**
- **Writing Environmental Reports.**
- **Ensuring Project Compliance with Environmental Regulations.**





ENGINEERING SOFTWARE PLATFORM

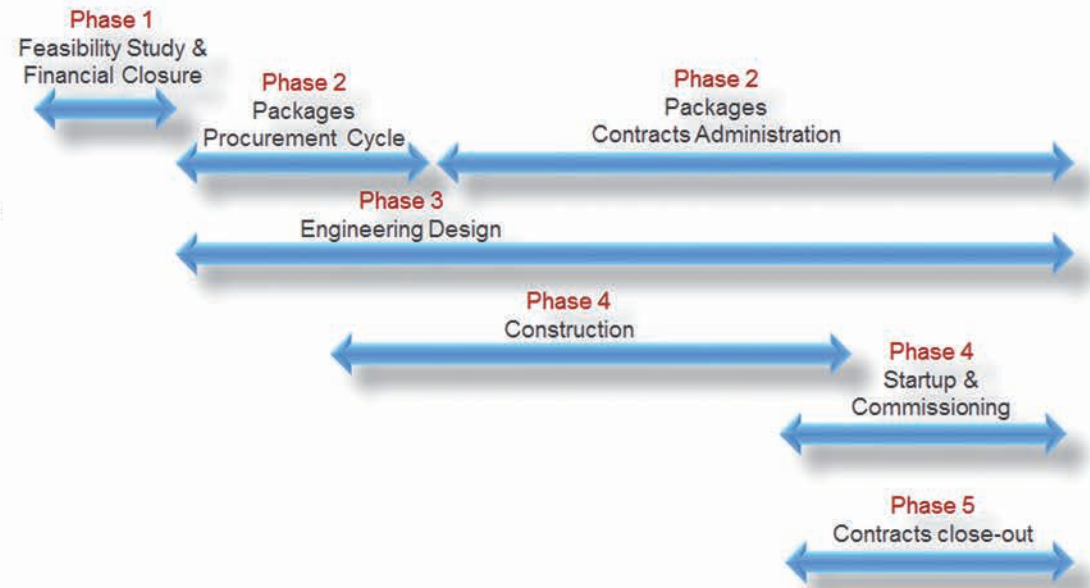
Architecture	ARCHICAD	Control Systems	Project Master
	MICROSTATION		InfoMaker
	Artlantis Studio		WinSteam
Civil / Structural	GT Strudl	Mechanical / Process	PDS2D P&ID
	MATHCAD		Gate Cycle
	ANSYS		PIPNET VISION
	SP MAT		PIPNET VISION (Transient Module)
	SP COL		AFT Arrow 4
	Staad Pro		DFA (PGESCo Developed for Feed Water Heaters Drain Lines Sizing Analysis)
	Tekla Structure	Plant Design	3E Plus
	Plaxis 2D		CAESAR II
	Plaxis 3D 2011		PSD Frames (PGESCo Developed for Piping Supports Supplementary Steel Design and Analysis)
	LPIPLE		PSD Hangers (PGESCo Developed for Piping Hangers and Supports Design & Selection)
Electrical	AUTOCAD	Smart Plant Enterprise Suite	SmartPlant 3D (SP3D)
	MICROSTATION		SmartPlant P&ID (SPPID)
	Staad Advanced Foundation		SmartPlant (SPEL) Import Manager
	Grounding CDEGS		SmartPlant Instrumentation (SPI)
	ETAP		SmartPlant Review (SPR)
	AG Lighting		SmartPlant Electrical (SPEL)
	PSS/E		SmartPlant Reference Data (SPRD)
	PED (PGESCo Developed for Cable Desing)		SmartPlant Foundation (SPF)
	PVSOL Expert		SmartPlant Foundation (SPBI)
	PVSyst		



PROJECT CONTROLS SERVICES:

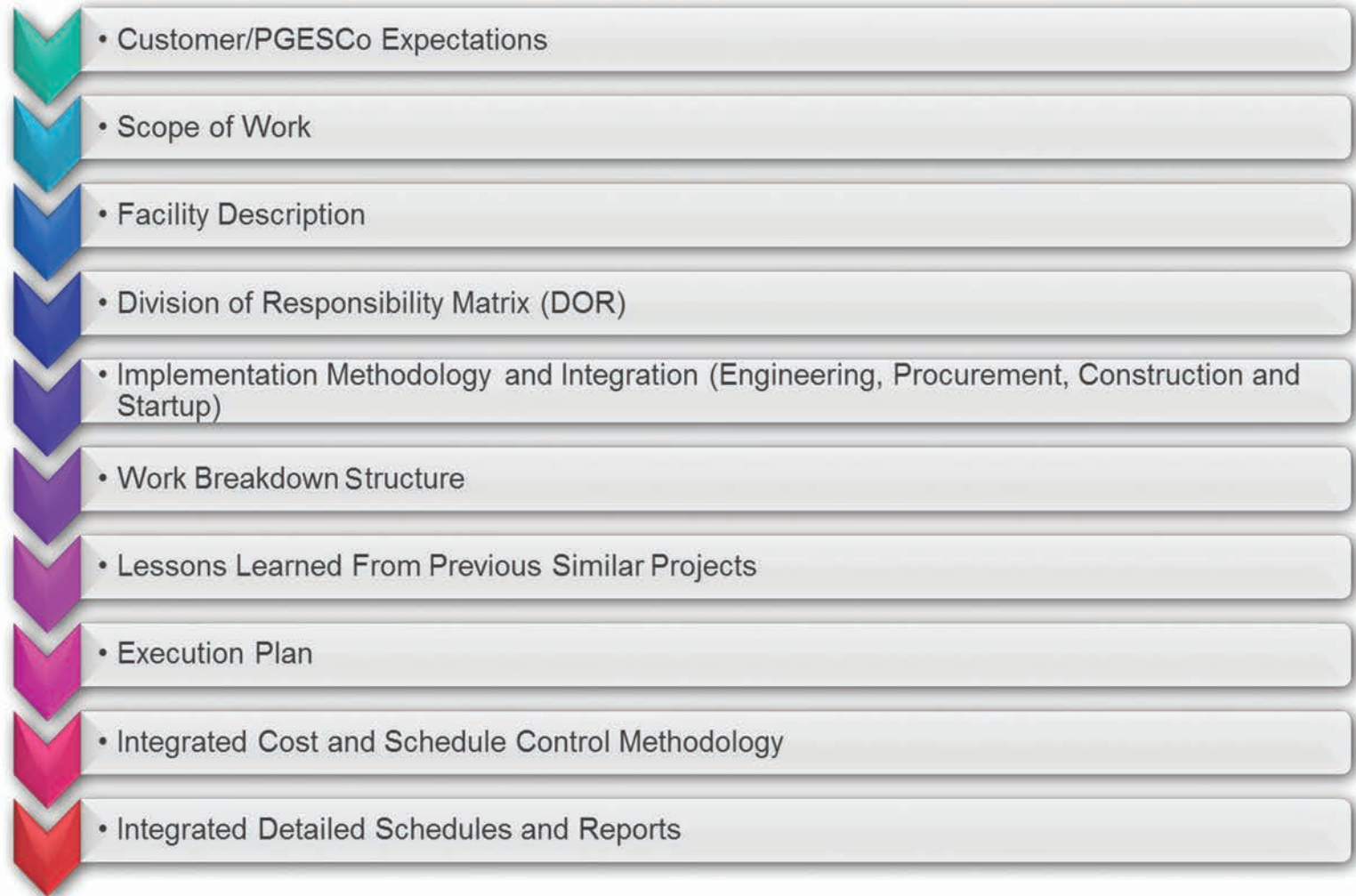
- Planning and Scheduling
- Project Cost
- Estimating
- Monitoring and Reporting

In addition, the Estimating Function Maintains a Historical Cost Database and Skilled Resources to Support the Business Development and Proposal Process

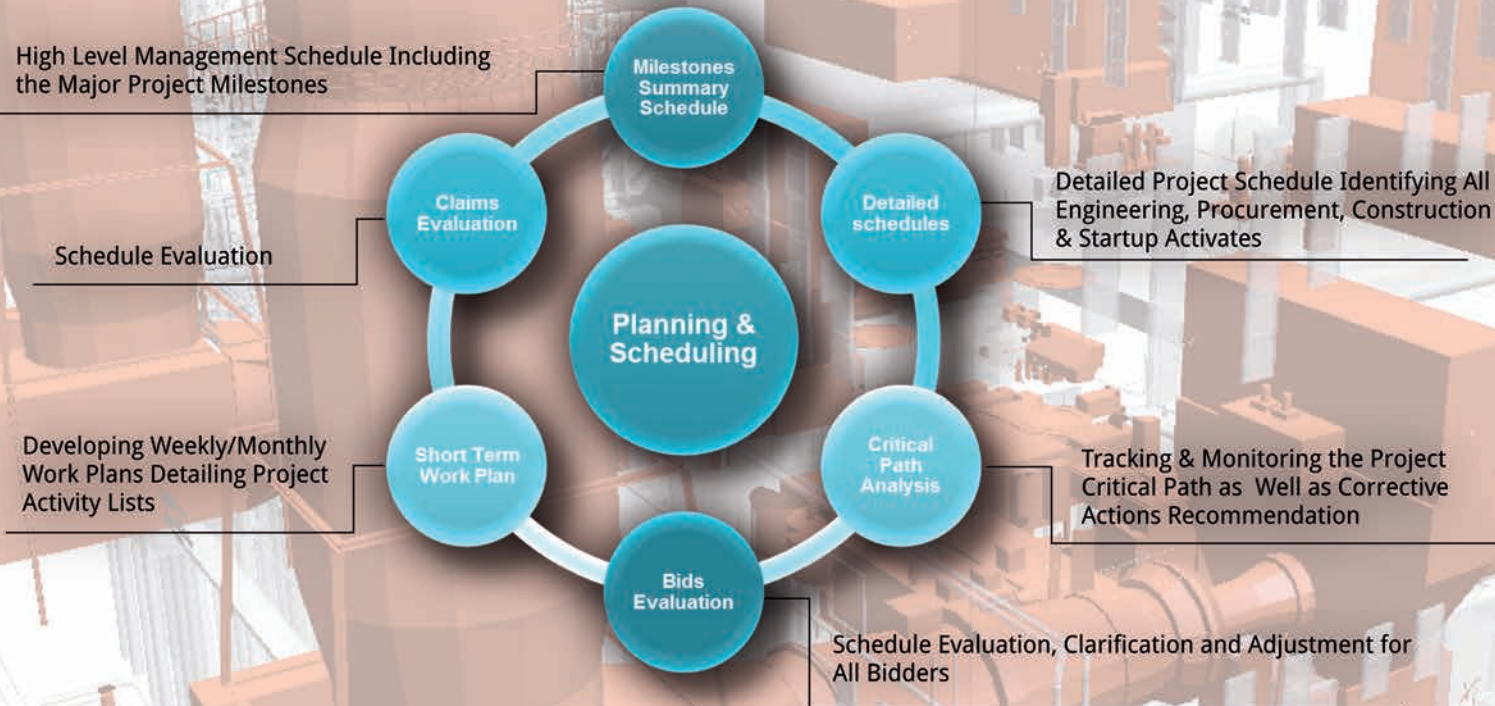




PLANNING PROCESS

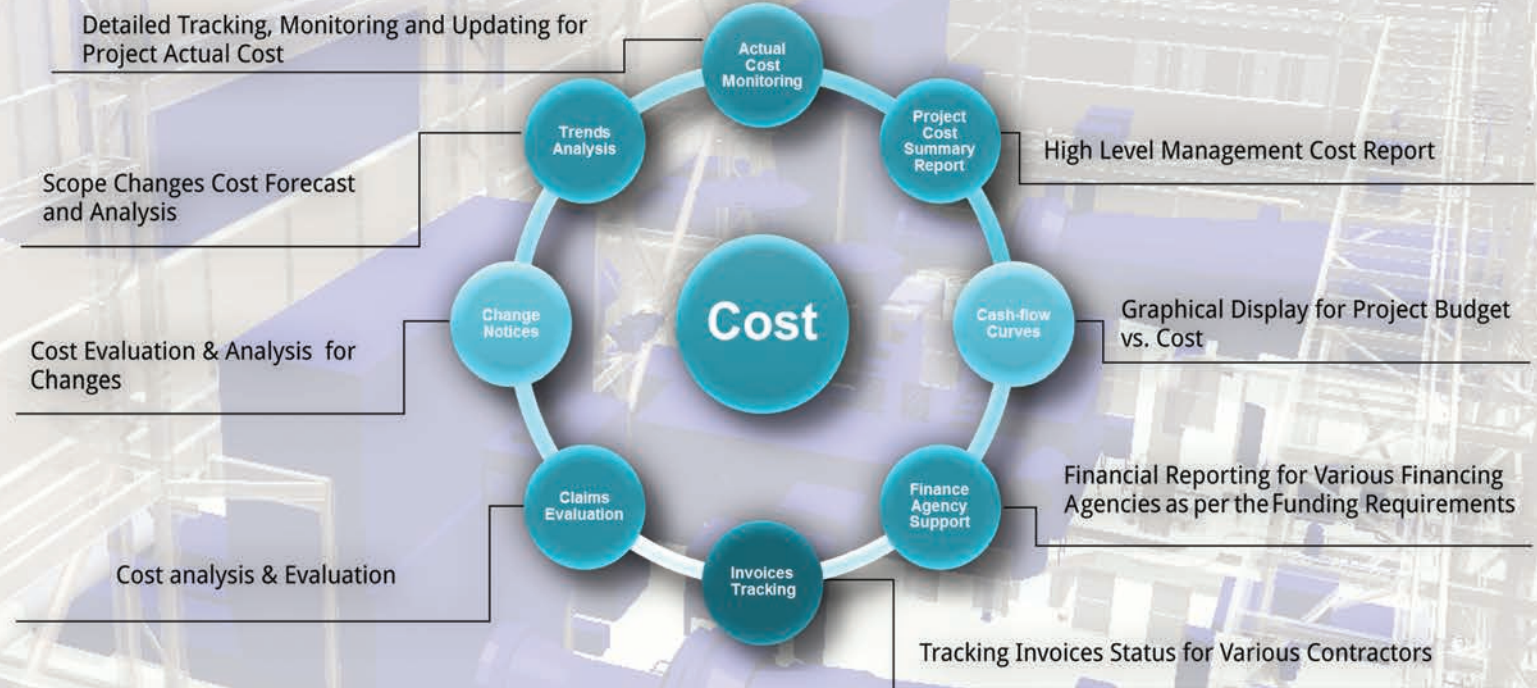


PROJECT CONTROLS PLANNING & SCHEDULING

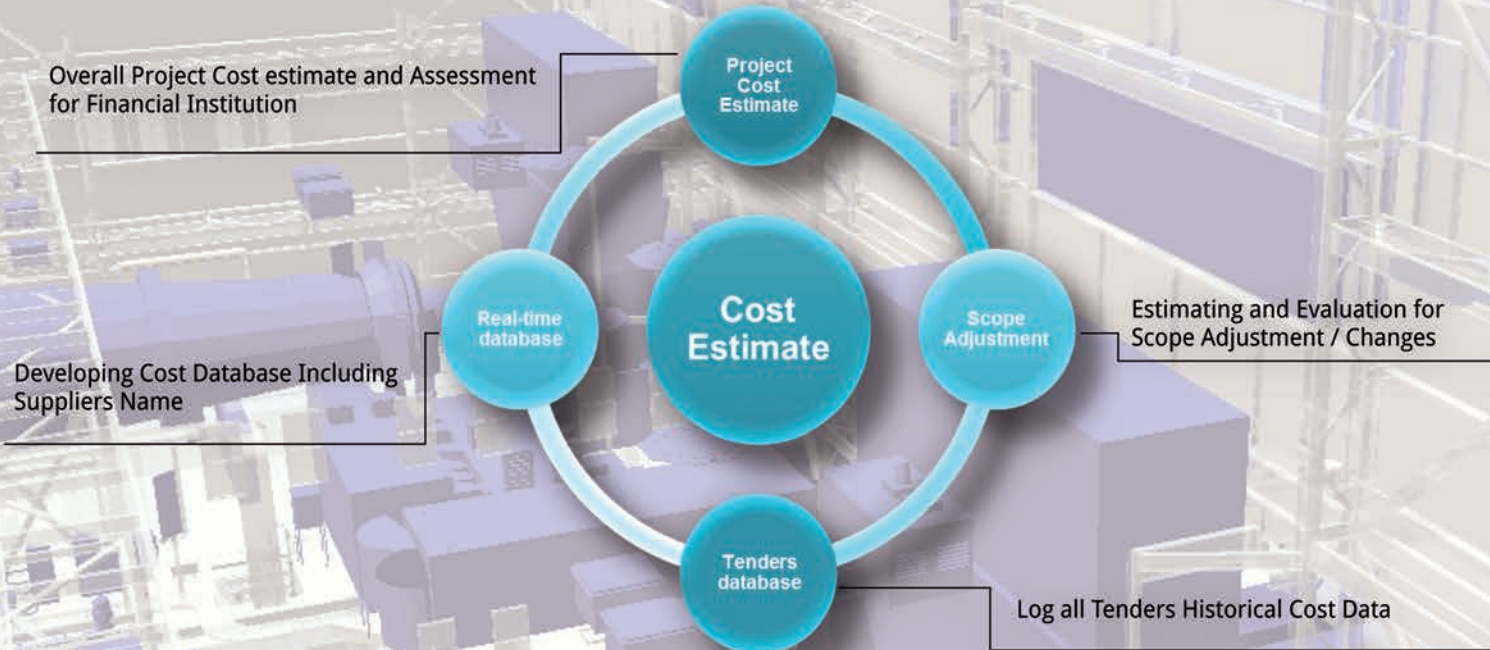




PROJECT CONTROLS COST CONTROL



PROJECT CONTROLS PLANNING & SCHEDULING





PROJECT CONTROLS COST CONTROL

Detailed analysis for the weekly activities as well as providing 3 weeks look ahead forecast for the project

Log all projects chronological events

Reporting the engineering, procurement and construction progress & performance



- Primavera
- Microsoft Office
- Milestones Professional
- Acumen Fuse
- Richardson Cost Estimate
- ROI (Financial model)





JOB SITE MANAGEMENT SERVICES

PGESCo Believes in Safety First, Then We Race to the end. From Site Tests to Contractor Interface, Our Team is on Schedule Rising up to your Highest Expectations Every Step of the Way .

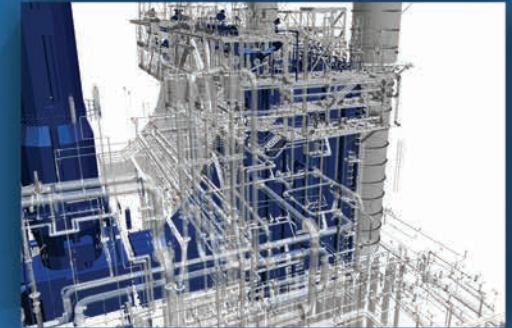
The Integrated Project Jobsite Team can Perform the Hereinafter Tasks During the Job site activities Execution.

CONSTRUCTION MANAGEMENT

- . Receive Contractor at Site via the kick off Meeting and Supervise Contractor Mobilization.
- . Review Contractor Resources Adequacy with Workload in Accordance with Schedule.
- . Review and Approve all Contractors Key Personnel Qualification.
- . Supervise all Material Delivery, Receiving, Storage and Handling in Accordance with Drawings and Specifications.
- . Review and Interpret Contractors' Drawings and Specifications.
- . Carry Out a Schedule-Monitoring Program.
- . Supervise the Construction Work.
- . Review Heavy Equipment Handling/Lifting Plans and Supervise their Execution.
- . Coordinate the Interfaces Among the Contractors and Resolve any Issues Concerning the use of Space (Coordinate and Sequence the Accessibility by the Various Contractors to the Different Work Area).
- . Conduct Periodic Coordination Meetings with the Contractors.
- . Supervise and Attend all Construction Testing Activities and Approve its Results .
- . Conduct Systems Walk Down .
- . Follow up System Punch List Closure and Turn Over to Startup and Commissioning .
- . Determine Construction Progress and Recommend Progress Payments.
- . Monitor Work Progress & Determine Extra Work and Changes.
- . Review Field Modifications and Provide their Disposition.
- . Review Test Procedures and Coordinate Engineering Comments on Field Construction, Field Surveys, Tests, Laboratory Services and Startup Management Activities.

STARTUP AND COMMISSIONING MANAGEMENT

- . Develop/Review Startup Schedules and Prepare an Integrated Startup Master Schedule.
- . Coordinate Contractors' Startup and Testing Activities.
- . Finalize Startup Scoping Drawings in Details after Design Completion.
- . Develop/Review Startup and Testing Procedures.
- . Manage and Authorize Work Permits.
- . Supervise Suppliers/Contractors' Startup and Testing Activities.
- . Establish and Control Work Permit Processes.
- . Review O&M Instructions Submitted by the Contractors.
- . Verify the Performance and Acceptance Testing of Equipment in Accordance With Previously Established Procedures and in Full Compliance With Design Specifications.
- . Prepare Turnover Schedule and Packages.
- . Assist Owner Operating Staff in Becoming Familiar With Operating the Plant, the Performance and Testing Procedures Relating to Performance Testing of Major Mechanical and Electrical Equipment and Overall Station Performance Tests.



ES&H MANAGEMENT

- . Review ES&H Plans for all Contractors During the Tender Evaluation.
- . Issue and Update ES&H Specification and Contract ES&H Requirements as a Minimum Requirements for Contractors ES&H Site Implementation.
- . Ensure Contractors Understand their ES&H Obligations by Participation on Pre-tendering, Procurements, Contract Evaluation & Pre-mobilization.
- . Develop the ES&H Requirements on Execution Plan.
- . Review and Approve Contractors ES&H Staff & Qualifications.
- . Review All Work Permits, Risk Assessments, Lifting Plans, Methods Statements, ES&H Training Programs, Medical Surveillance, Waste Management, Hazard Communications, and Others.
- . Coordinate Site ES&H Construction, Startup & Commissioning Activities.
- . Conduct ES&H Site Inspection and Issue of Corrective Actions / Nonconformance Reports.
- . Coordinate Site Emergency and Evacuation Plan & Drills.
- . Investigate Incidents & Near Misses and Issue of Lesson Learned.
- . Review All Environmental Measurements and Ensure Compliance With Laws and Regulations.
- . Review Licenses and Certifications and Conduct Inspection of Equipment's before Allowing Site Operation.
- . Coordinate, Lead Site ES&H Meetings and Site Walkthroughs.
- . Conduct Several ES&H Training for PGESCo/ Client's Employees.
- . PGESCo is Certified for ISO 14001 & OHSAS 18001.

• **PUNCH LIST PROGRAM**

Program Controls all Punch List Items (ownership Open & Close) for every Contractor Included with severity Category Leveling.

• **IO LIST PROGRAM**

Program Controls all Loop and Functional Checks for every Contractor.

• **DAILY REPORT PROGRAM**

Program Manages all Daily Reports Issued by the Construction Engineers that Shows Daily Activities Attached with Site Photos.

• **BIM PROGRAM**

BIM (Building Information Management) Program Manages the Steel Structure Work Process Starting from Engineering, Purchasing, Fabrication, Delivery, Handling and Erection.

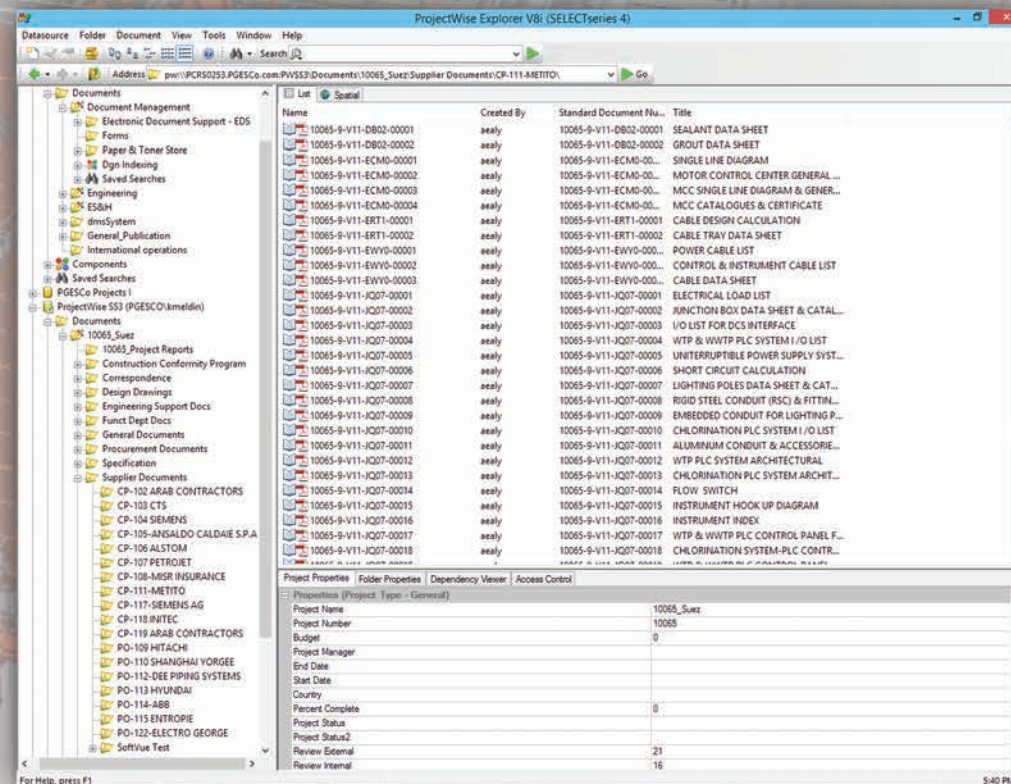
• **LESSON LEARNED PROGRAM**

Program Captures Lessons Learned for Running Jobs to be Utilized in Future Jobs Enhancement and Improvements.



DOCUMENT CONTROL / RECORD MANAGEMENT

- Receipt of all Project Documentation.
- Control and Classify According to Assigned Document Numbering System as Per PGESCo Standard Numbering System or Client Specific System.
- Logging and add all Project Documentation to the Project Data Base (ProjectWise).
- Log Out for the Project Documents & Issue Transmittals.
- Distribute all Project Document Types Distributed as the Project Distribution Matrix.
- Maintain Project Retention Plan.





PRIME CONTRACTS & PROCUREMENT

PGESCo Uses Multi-Package and Turnkey Contracting Systems Depending on The Client Requirements and Costs Optimization opportunities.
Also Uses Competitive Tenders, Setting All Technical Terms and Commercial Conditions to Evaluate Bids.

SCOPE

Prime Contracts (Formation and administration of contracts between PGESCo and Clients).
 Project Procurement.
 Contract/Purchase Order Administration.

PRIME CONTRACTS MAIN TASKS

Contractual Risk Identification & Assessment
 Preparation of Different Types of Agreements such as:

- Non-Disclosure Agreements.
- Memoranda of Understanding.
- Joint Venture Agreements.

Review Terms and Conditions Provided by Clients and Identification of Required Changes.
 Contract Negotiations and Conforming Contract Documents to Incorporate Agreement Between Parties.
 Prime Contract Administration (Invoices/Changes/Amendments, etc.)

PROJECT PROCUREMENT PRE-AWARD

- Development of Contracting Plan Depending on Client needs .
- Pre-qualification of Tenderers and Evaluation of their Capabilities Based on Previous Experience, Financial Standing, Technical Capabilities and Safety Records etc.
- Development, Review and Issuance of Tender Documents in Accordance with Owner and Financing Requirements and Procedures.
- Coordinate Tendering Period Activities such as Conducting Pre-tender Meetings, Issuance of Addenda, etc.
- Evaluation of Tenders Received and Issuance of Recommendations of Award to Owner.
- Conducting Pre-award Negotiations with Successful Tenderer/Conforming Contracts.





PGESCO EPCM MODEL OF MULTI-PACKAGE CONTRACTING PLAN FOR POWER PLANTS

Typical Range: 17-22 Contract and Purchase Order Packages
(Client is Electricity Utility)

Contract Packages – Supply & Installation Scope

- Combustion Turbine Generator.
- Civil Works.
- Environmental Monitoring .
- Switchyard.
- Heat Recovery Steam Generator/Boiler .
- Steam Turbine Generator.
- Yard Tanks.
- Wrap-Up Insurance.
- Water And Waste Water Treatment.
- Elec. Equip./Instrument. Install.
- Mech. Equip./Pipe Install.
- Intake And Discharge Off-Shore.
- Site Services.

Purchase Orders – Supply only

- Pumps And Drives.
- Feed Water Heater.
- Critical Piping And Valve.
- Power Transformers.
- Distributed Control System.
- Desalination Plant.
- Medium And Low Voltage Switchgears.



EPC MODEL OF MULTI-PACKAGE CONTRACTING PLAN FOR POWER PLANTS

Typical Range: 50 Material Requisitions
(Client is EPC Contractor)

List of Material Requisitions

List of Material Requisitions		
<ul style="list-style-type: none"> * Overhead Bridge Cranes and Gantry Crane CTG. * Overhead Bridge Cranes and Gantry Crane STG. * Water and Wastewater Treatment Package. * Hoists, lifting Devices and Monorails. * HVAC For GIS (Switch GEAR and Control Room). * HVAC For CTG. * HVAC For STG Buildings and Control Building. * HVAC for Balance of Plant. * All field Erected Tanks. * Non Metallic Tank. * Fire Water Pumps, Drives and Controllers. * Sump and Vertical Pumps. * Fire Protection Systems and Equipment (GIS , GIS Control , Central Control Building and Gas Station). * Fire Protection Systems and Equipment (BOP). * Compressed Air Plant Package. * Service Water Pumps. 	<ul style="list-style-type: none"> * Water pumps. * Emergency Shower and Eye/ Face Wash Stations. * Conical and Wye Strainers. * Valves. * Nitrogen Bottle Gas Distribution System. * Hydrogen Bottle Gas Distribution System. * Carbon Dioxide or Argon Bottle Gas Distribution System. * Hydro-Pneumatic Tank * Sanitary Sewage Lift Station Equipment/Pumps. * Elevators. * A/G Supports / Pipe Rack . * GIS and GIS Control. Buildings: Telecommunication system. * CTG and Central Control Buildings: Telecommunication system. * Others Buildings: Telecommunication System. * GIS, GIS Control, CTG and Central Control Buildings: Lighting Panels. * Others Buildings :Lighting Panels. 	<ul style="list-style-type: none"> * UPS & DC System. * Distribution Transformers and LV Switchgear (Load Center). * Cathodic Protection System (Tanks). * Cathodic Protection System (U/G Piping). * Flow Elements. * Temperature Elements. * Pressure Gauges. * Level and P/DP Transmitters. * General Service Control Valves. * Tubing & Racks. * Tanks Accessories.

- . Issuance of Contractual Correspondence.
- . Change Management: Issuance/Tracking of Change Notices and Preparation of Contract Amendments.
- . Claims Management and Settlement.
- . Review/Processing of Invoices.
- . Follow-up and Monitoring of Submittals, Documentation, Guarantees, Insurance Coverage, Back Charges.
- . Administration of Supplier Quality Program/Plan and Manufacturing Inspection.
- . Support of Owner During Arbitration Procedures.
- . Processing and Negotiation of Insurance Claims.
- . Assessment of Contractual Liquidated Damages for Performance and/or Delays.
- . Issuance of Completion Certificates.
- . Contract Closeout Activities.
- . Local and international Expediting.

EXPEDITING SERVICES

Expediting Services

- Material Tracking Systems
- Integration with other Project schedules and Deliverable

Item Description	Vendor/Country	Procurement									
		Placing Order					Receiving at Workshop				
		Planned	Forecast	Variance Forecast	Actual	Variance Actual	Planned	Forecast	Variance Forecast	Actual	Variance Actual
Equipment/Material Furnished by Supplier											
Vertical can-type condensate pumps complete with electric motor drives and accessories											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/29	16/2/29	0	16/2/29	0
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/29	16/2/29	0	16/2/29	0
Motor driven HP/LP feedwater pumps complete with electric motor drives, accessories and individual automatic recirculation system											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/5/9	16/5/9	0	16/5/9	0
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/6/6	16/6/6	0		
Anchor Bolts and Embedded Items(LP/HP FP)											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/4	16/2/4	0	16/2/4	0
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/4	16/2/4	0	16/2/4	0
Startup & Commissioning Spare Parts and Special Tools(LP/HP FP)											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/6/23	16/6/23	0		
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/6/23	16/6/23	0		
Anchor Bolts and Embedded Items(CEP)											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/4	16/2/4	0	16/2/4	0
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/2/4	16/2/4	0	16/2/4	0
Startup & Commissioning Spare Parts and Special Tools(CEP)											
Unit 1	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/6/3	16/6/3	0		
Unit 2	South Korea	15/12/31	15/12/31	0	15/12/31	0	16/6/3	16/6/3	0		

Extensive Experience in Interface with Multiple Financing Agencies in:

- Preparation of Bid Documents in Accordance with Guidelines
- Coordination of Bidding Process
- Coordination of Reviews and Approvals of Tender Documents, Contract Documents, Amendments, etc.

INTERFACE WITH FINANCING AGENCIES



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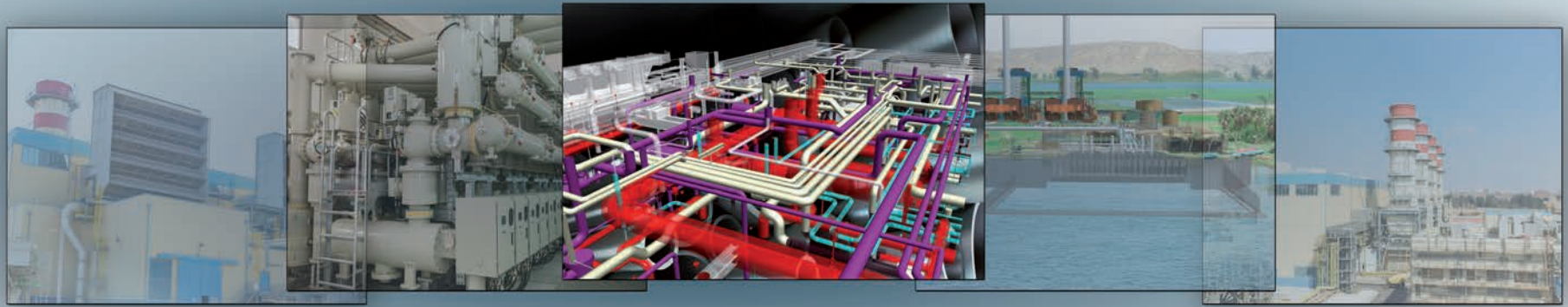
European
Investment
Bank



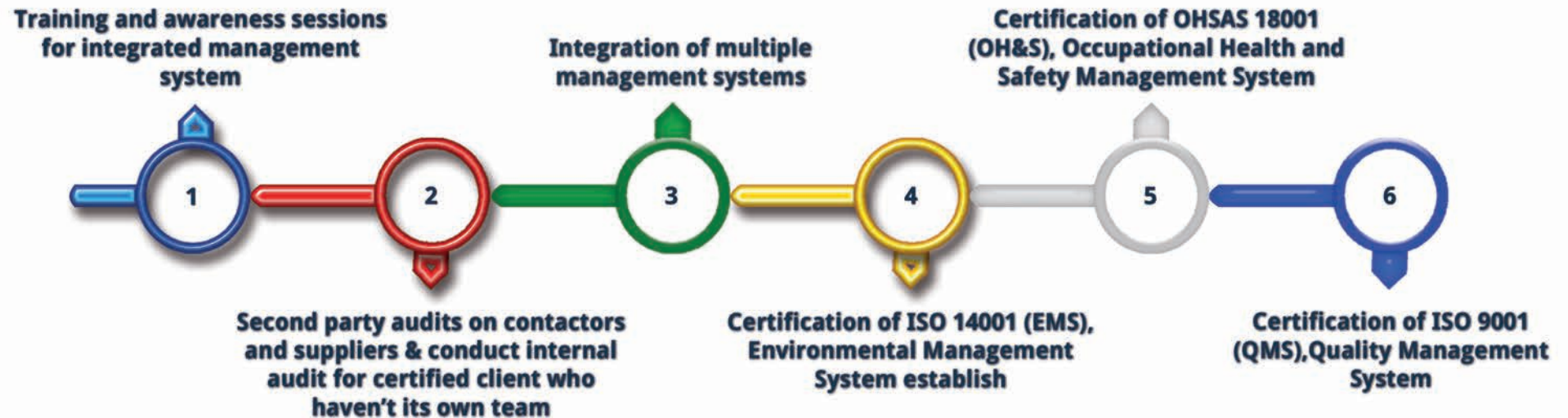
صندوق أبوظبي للتنمية
ABU DHABI FUND FOR DEVELOPMENT



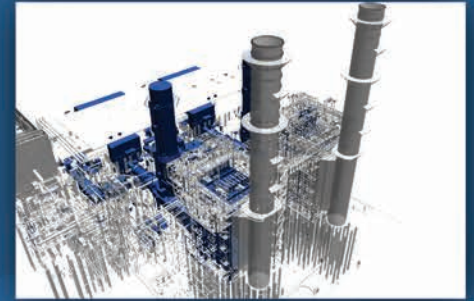
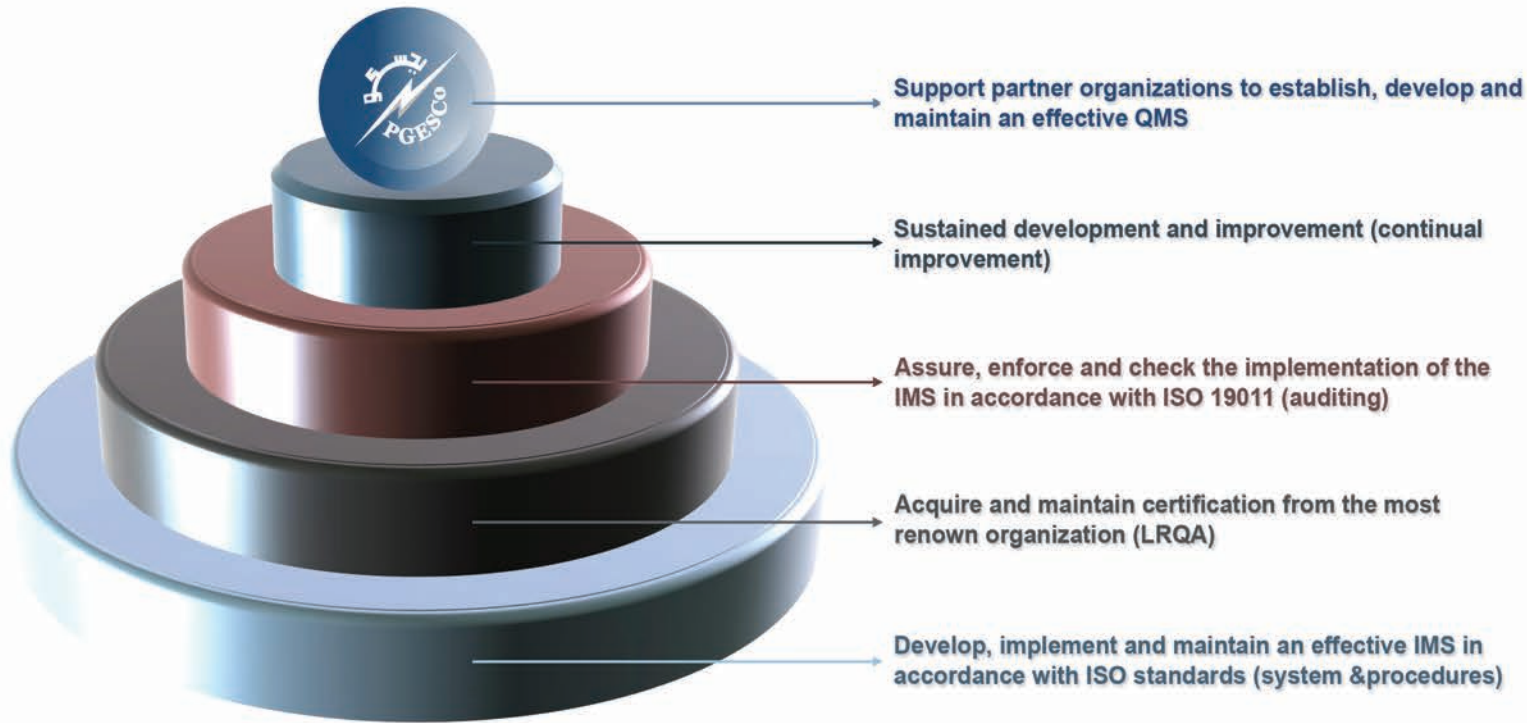
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QUALITY MANAGEMENT

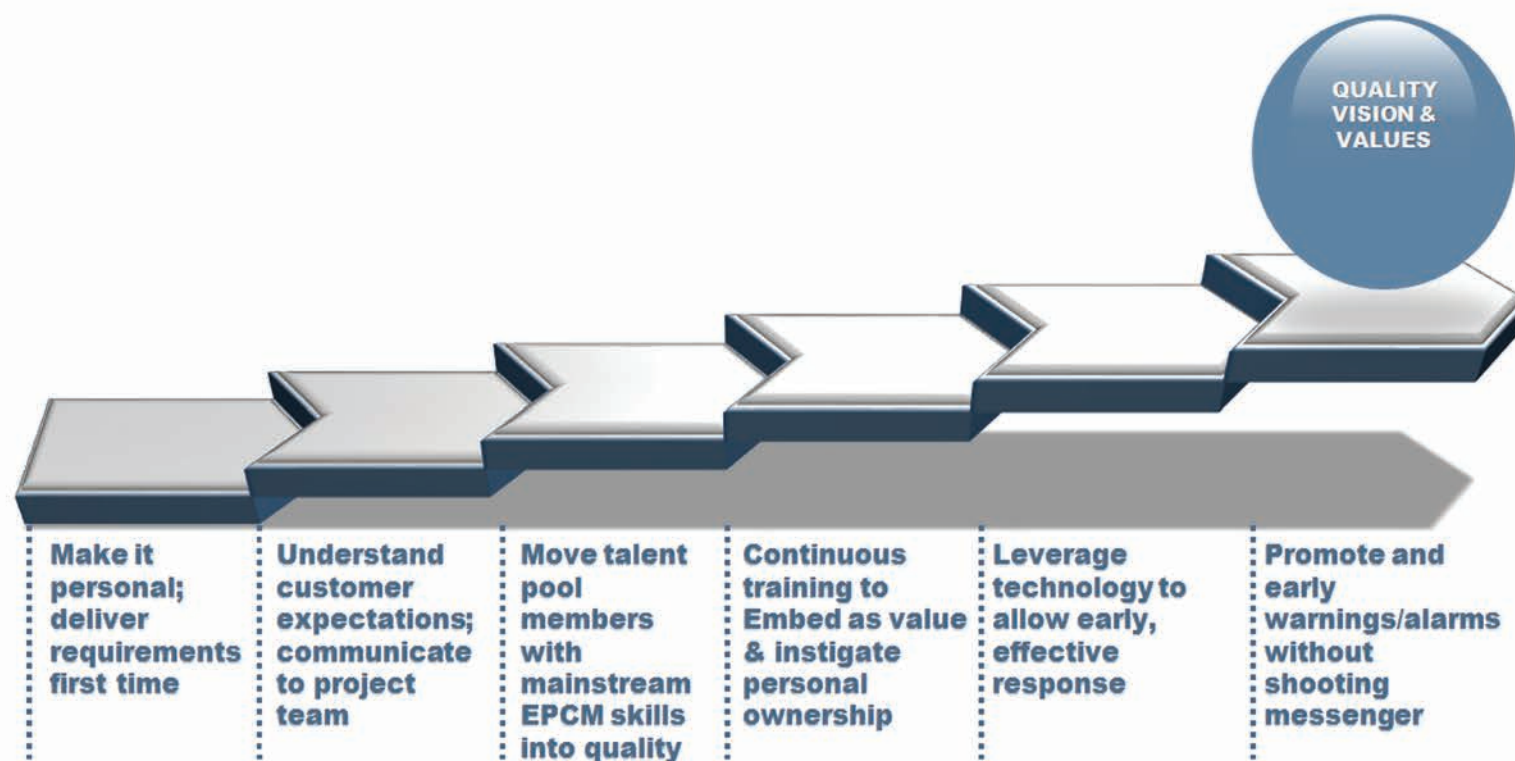


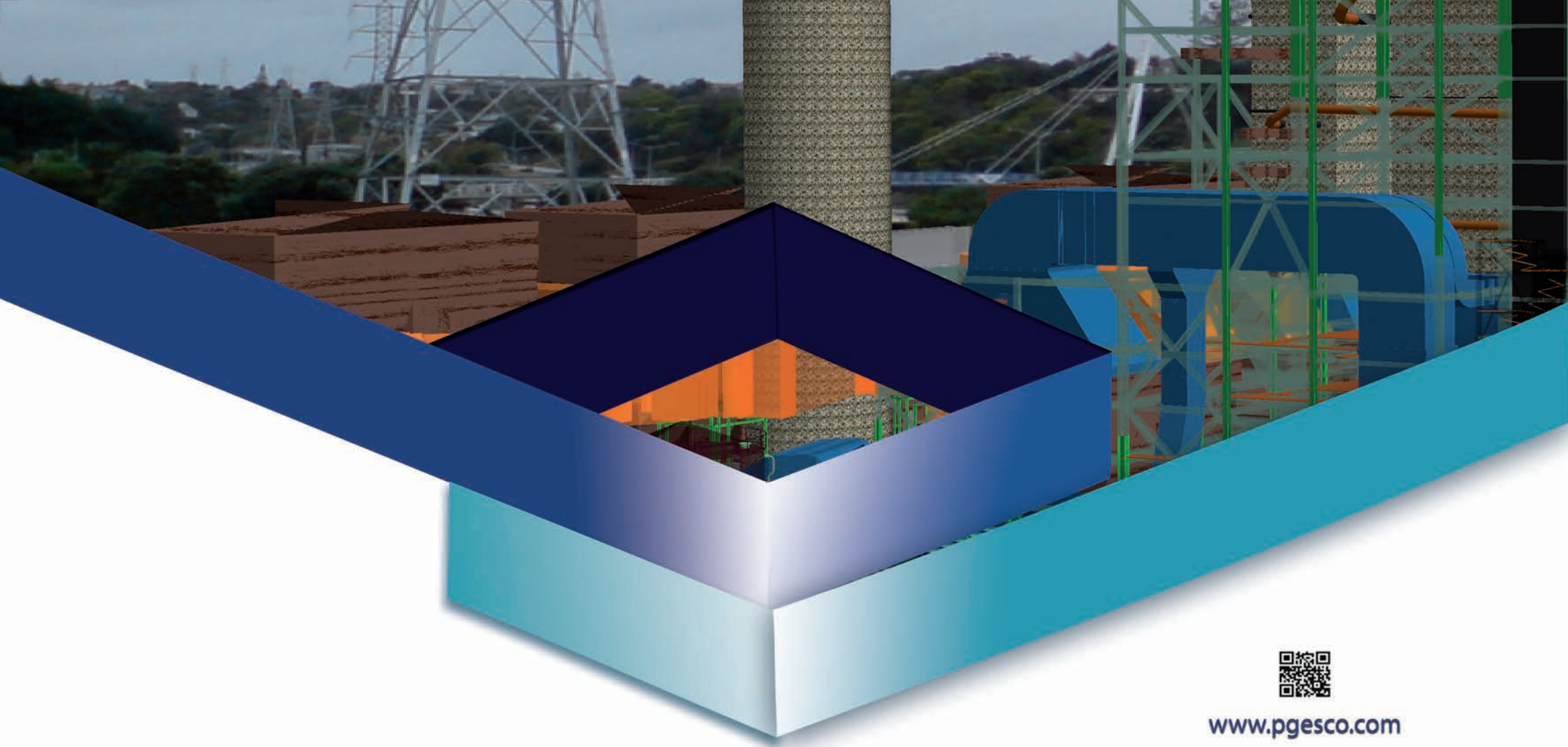
QUALITY MANAGEMENT MISSION







QUALITY MANAGEMENT VISION & VALUES





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