

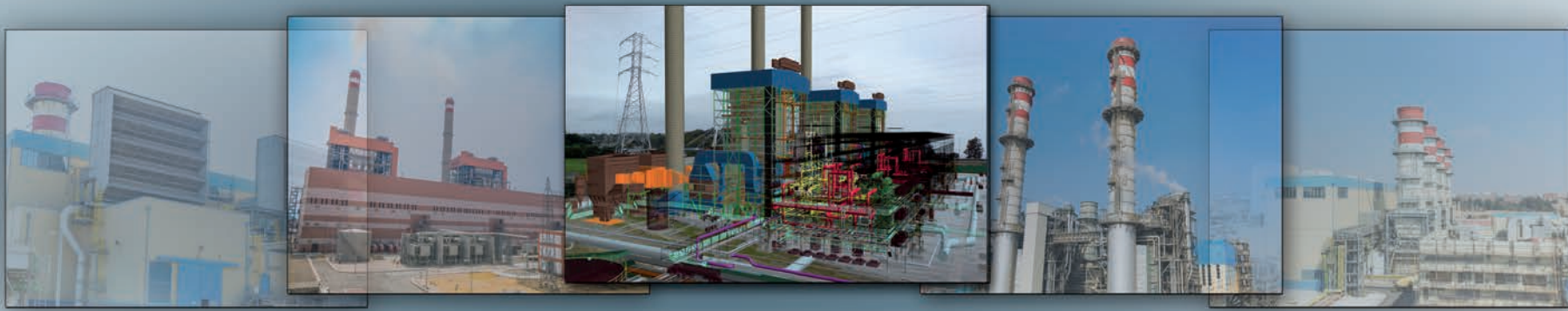


**PGESCO**



**SERVICES PORTFOLIO**

FUTURE@FINGERTIPS



## PGESCo SERVICES PORTFOLIO TABLE OF CONTENT

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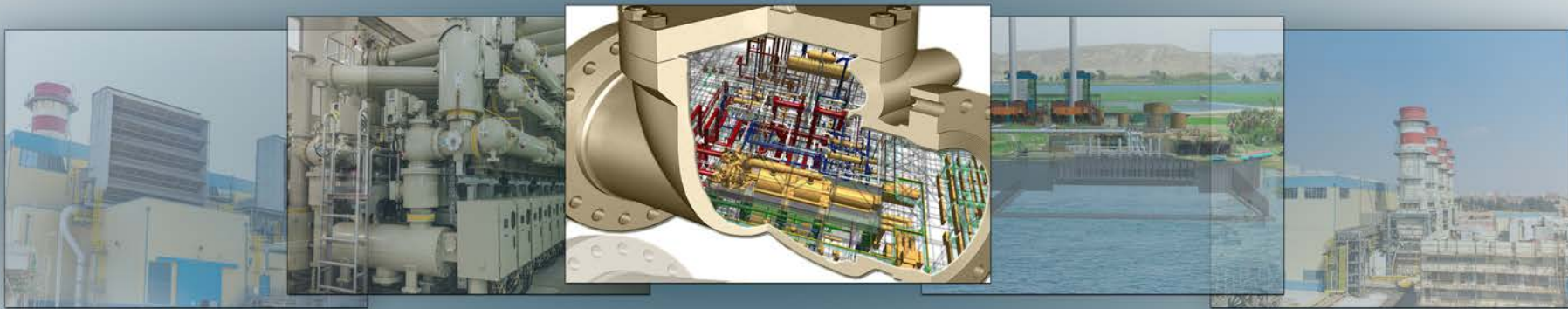
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## **PGESCo Records**

**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.**

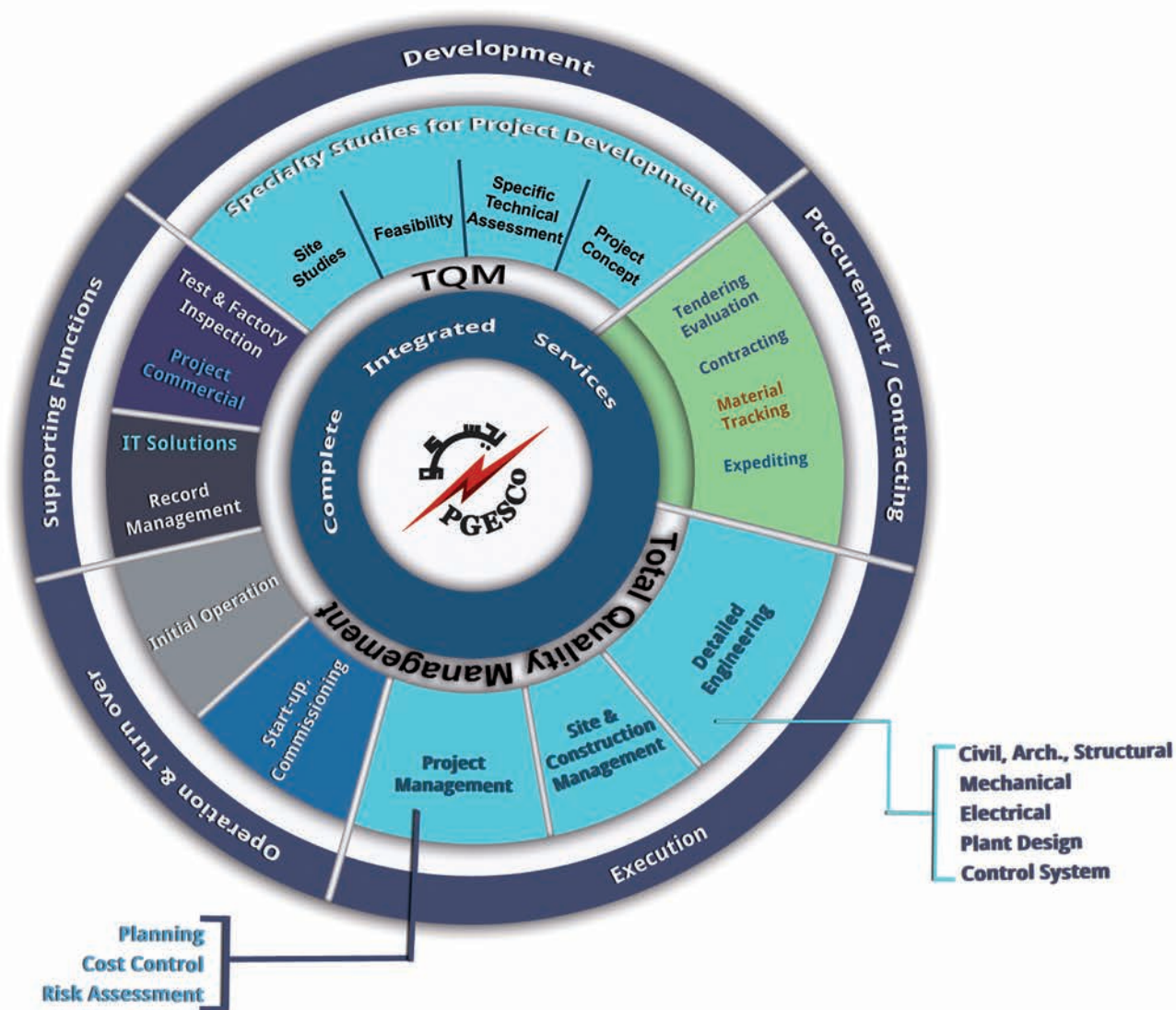


## Engineering Design of



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.**

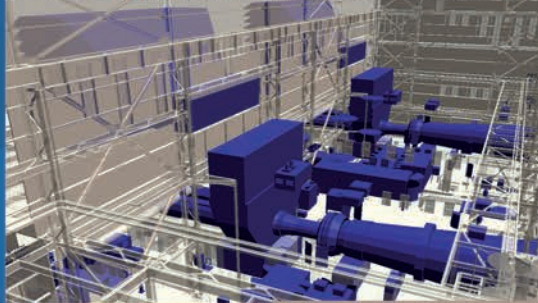
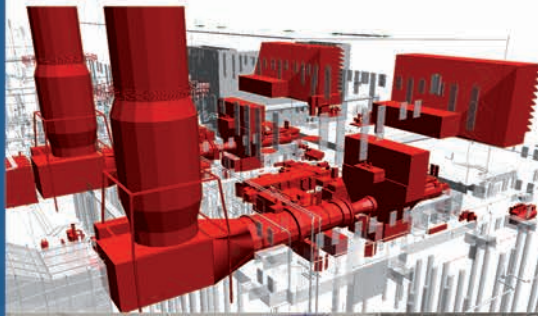
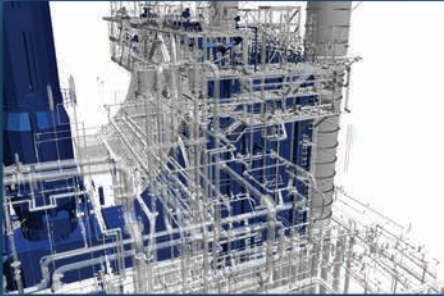
**Our skills include structural steel design, foundations design such as large rotating equipment foundations design, architectural design, electrical engineering design, equipment management and process design, Piping Stress analysis, layout, load analysis and piping supports design.**

**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



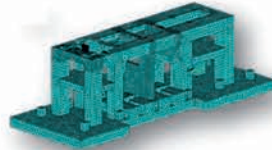
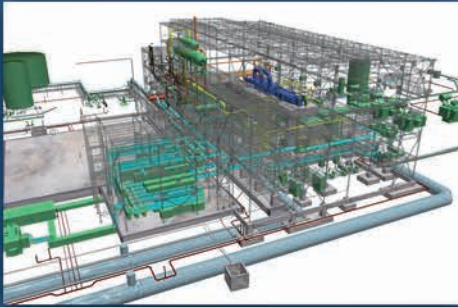
**KUREIMAT ADMINISTRATION BUILDING**

## FULL RANGE OF ARCHITECTURAL DESIGN INCLUDING:

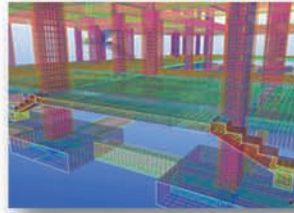
- . Power Plant / Buildings
- . Auxiliary Buildings
- . Ancillary Buildings and Colony

## 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

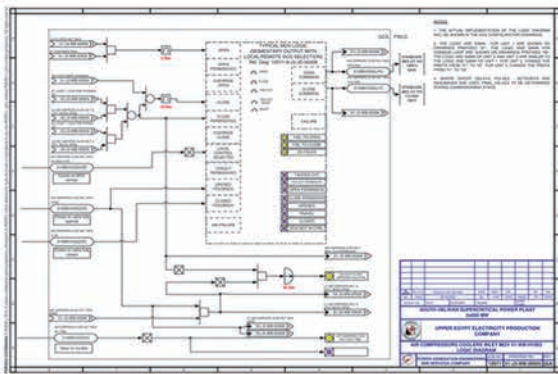
Control Valve Sizing and Selection

Instrument Location Plans

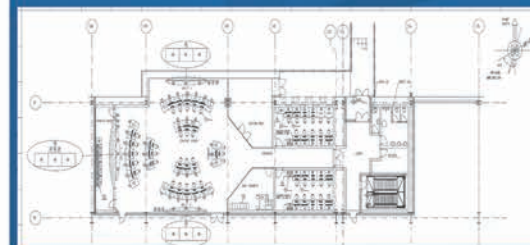
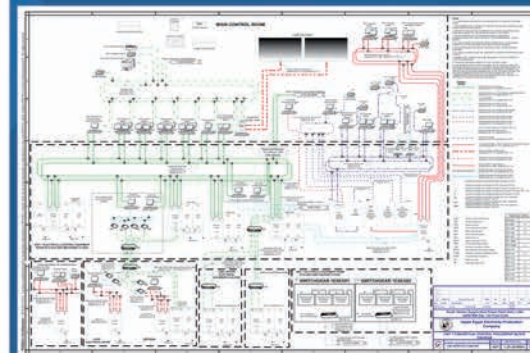
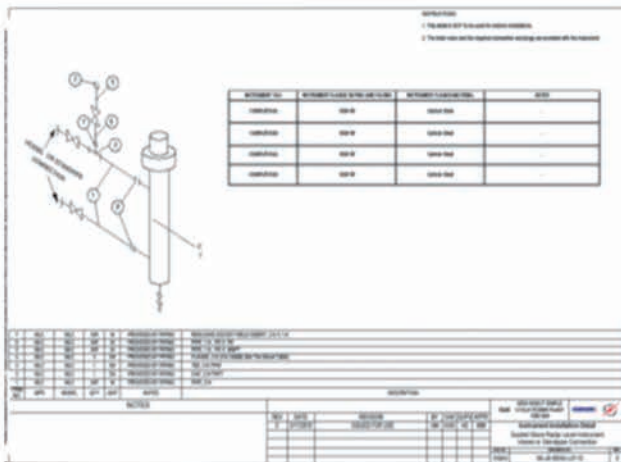
Instrument Installation Details (IID)

Continuous Emissions Monitoring System (CEMS)

Steam & Water Analysis System (SWAS)

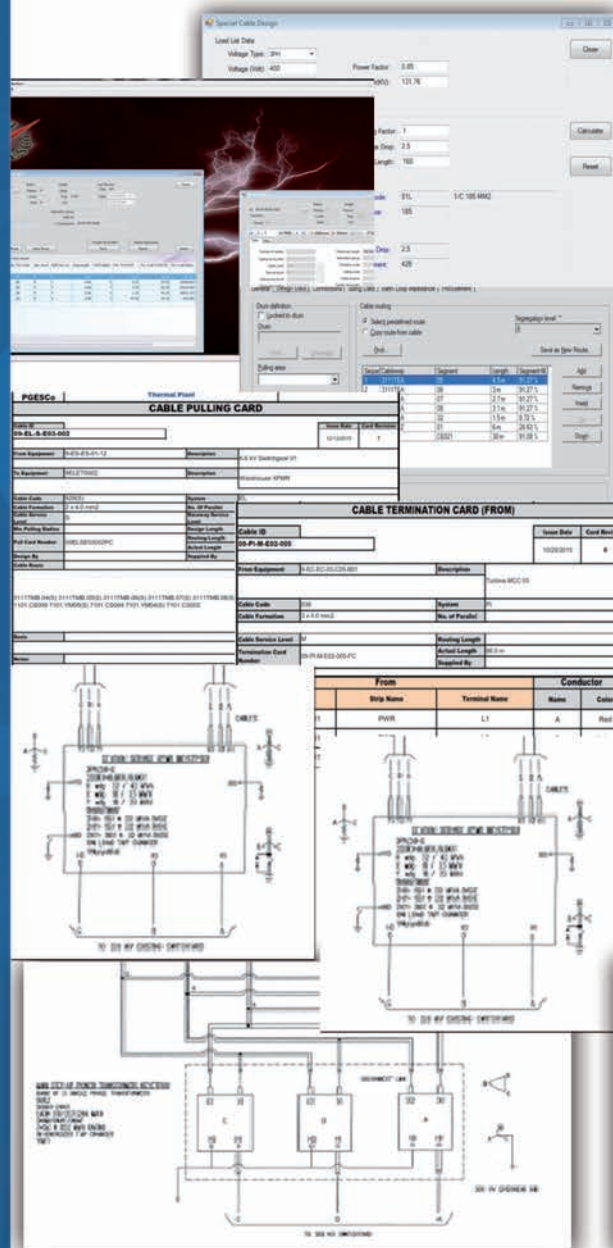


NO.	DESCRIPTION	UNIT	INSTRUMENT SYMBOL	INSTRUMENT TAG	INSTRUMENT FUNCTION	INSTRUMENT SPECIFICATION	INSTRUMENT DATA SHEET
1	TEMPERATURE	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
2	PRESSURE	PRESS	PRESS	PRESS	PRESS	PRESS	PRESS
3	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL	LEVEL
4	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
5	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS	ANALYSIS





## ELECTRICAL ENGINEERING SERVICES

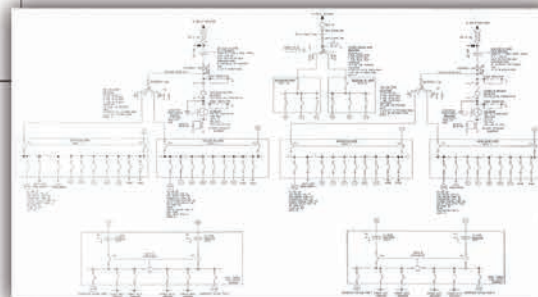


### Single-line and Phasing Diagrams

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

### Plant Cabling

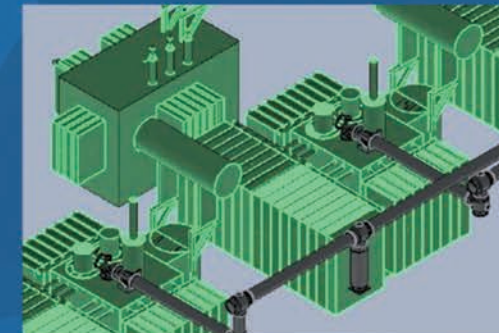
- Cable Design that Includes Cable Type and Size Selection Using PGESCO Proprietary Software.
- Cable Routing that Includes Cable Pathway Selection, Cable Filling and Length Calculations, and Cable Pulling Cards Using Both PGESCO Proprietary and International Software.
- Cable Termination that Includes 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

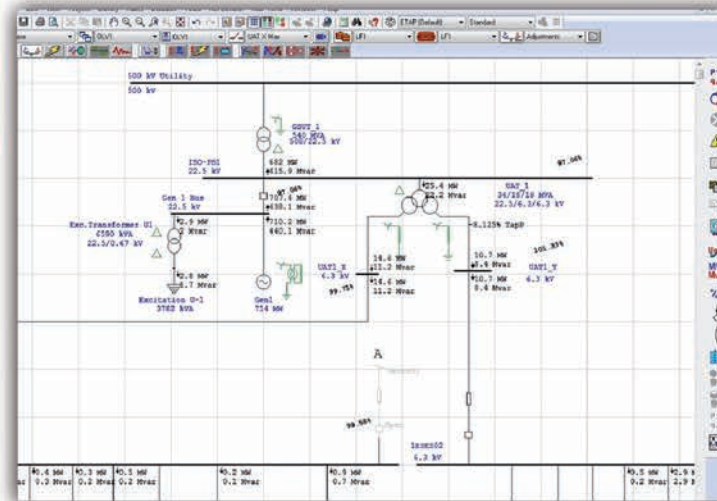


- Equipment Layout Drawings
- Raceway System Design

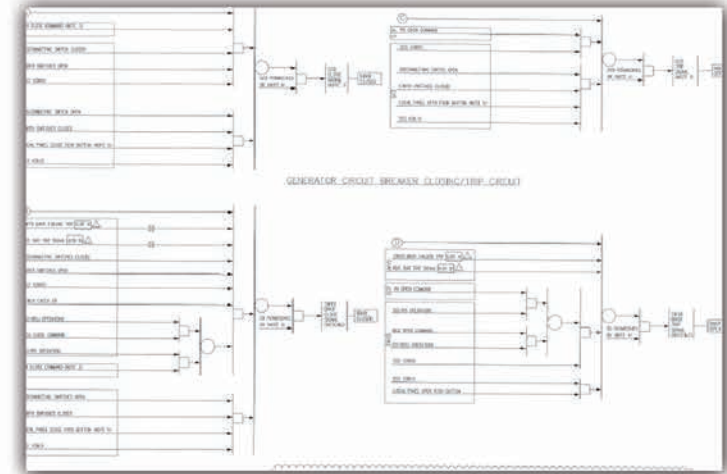
## ELECTRICAL ENGINEERING SERVICES

### Breaker Logic Diagrams Power System Studies

- Short Circuit Calculations
- Load Flow
- Motor Start Simulations

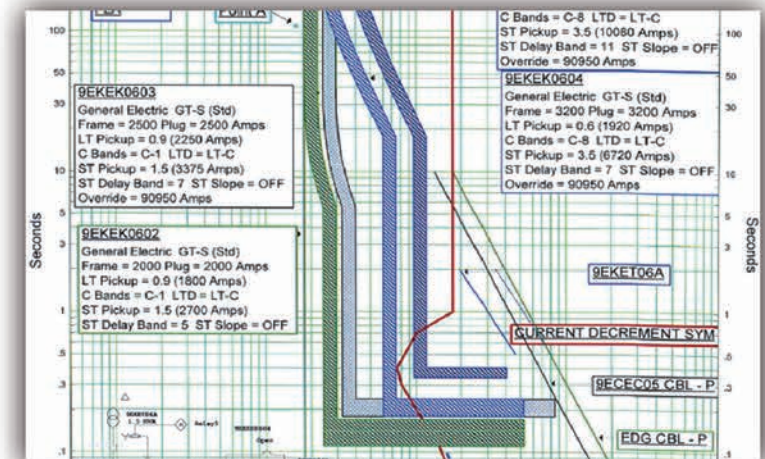


### Protection Setting and Relay Coordination Study



### 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.**

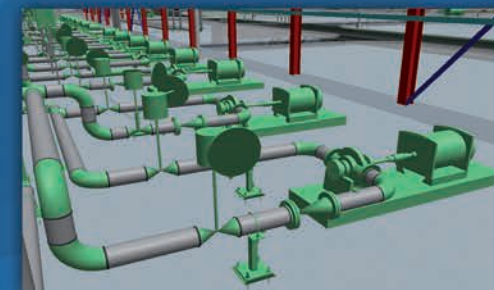
## MECHANICAL ENGINEERING SERVICES

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

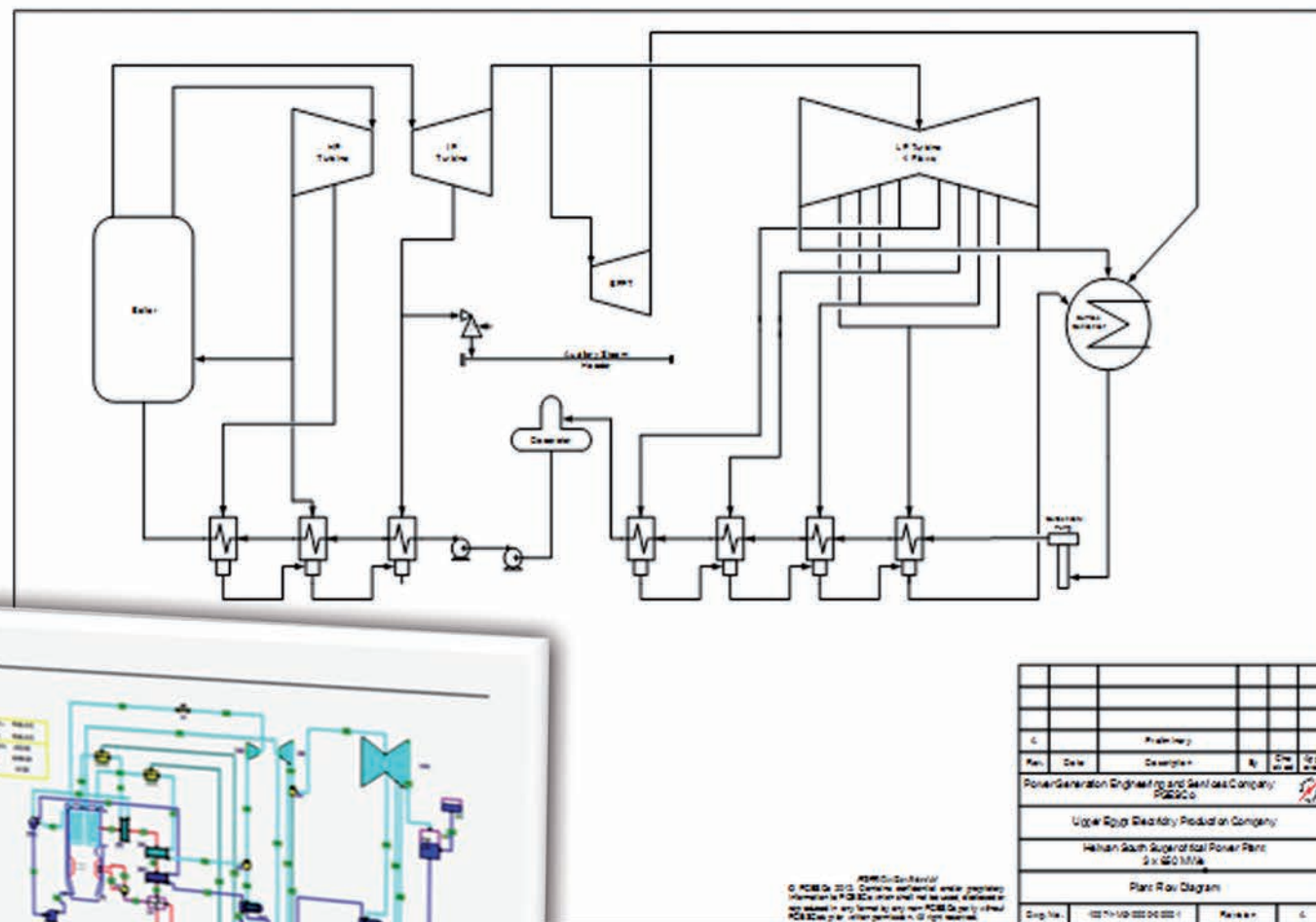
- . Power Plant heat & Mass Balance Conceptual Design
- . Preliminary Design Report
- . Process piping and Instrument diagrams P&IDs
- . Pipe List, Valve List, Equipment List and Specialty List
- . Detail systems design calculation including piping and mechanical sizing
- . Equipment technical specifications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

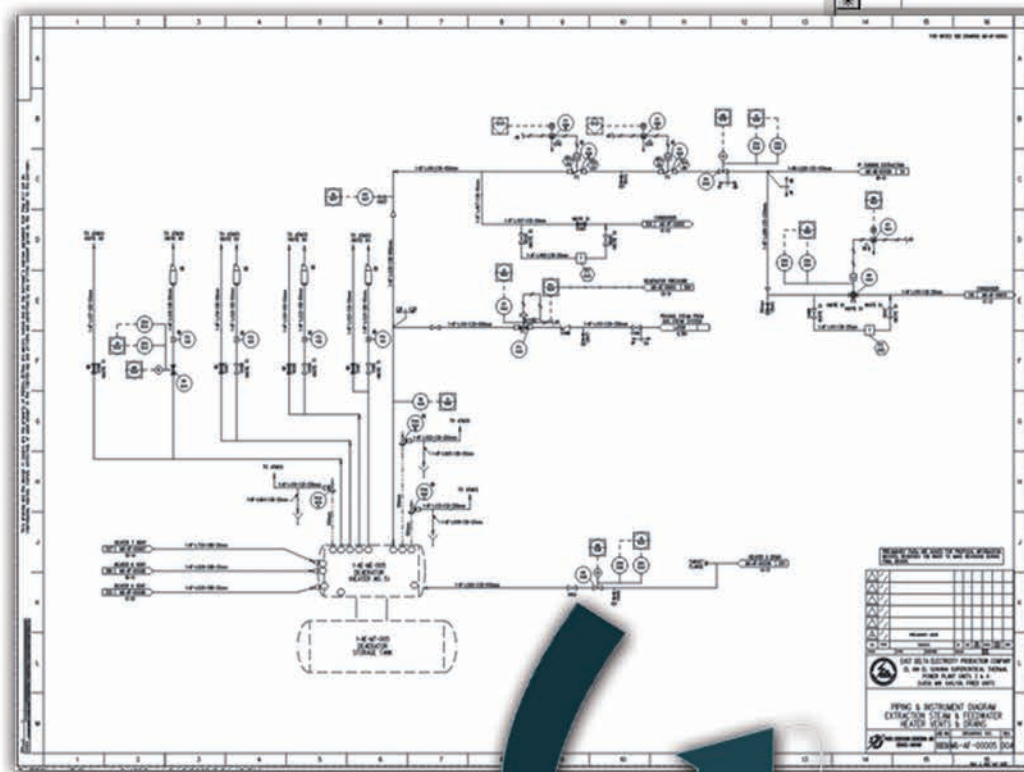




# Intelligent Piping & Instrument Program



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

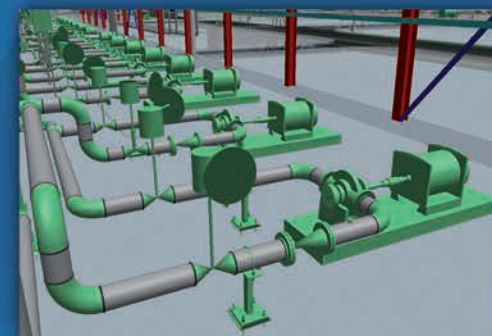
Options: Clear, Add All, Delete Row

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-L040-C90-25mm	Y strainer	CP-118	7-M6-AB-00001	B		0
7-AB-PY-002	7-AB-L040-C90-25mm	Strain trap	CP-118	7-M6-AB-00001	B		0
7-AB-PY-003	7-AB-L024-460-25mm	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	P&ID	UNIT	DESCRIPTION	QUANTITY	CP NO	SPEC NO	P&ID	P&ID REV	REMARKS	LIST REV
7-AB-PY-001	B	7	Y STRAINER	1	CP-118	7-M6-AB-00001	7-M6-AB-00001	B		0
7-AB-PY-002	B	7	STRAIN TRAP	1	CP-118	7-M6-AB-00001	7-M6-AB-00001	B		0
7-AB-PY-003	B	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	Site Area	Valve Type	Stream Code	Service Application	Process Description	Design Pressure (bar)	Service Pressure (bar)	Design Temp. (°C)	Service Temp. (°C)	LAIR Service	Final Material	Life Cycle	Insulation	Remarks
7-AB-L001	7-AB	Gate	ProcessWater	12-12	Process Water (12-12) to 12-12 (12-12) (12-									



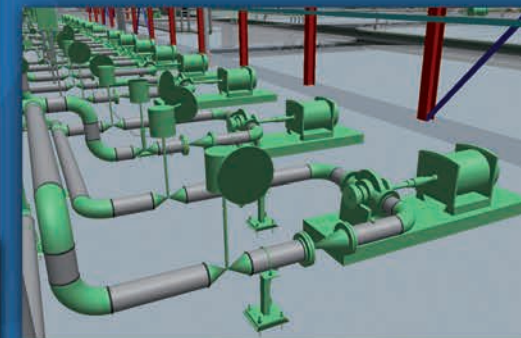
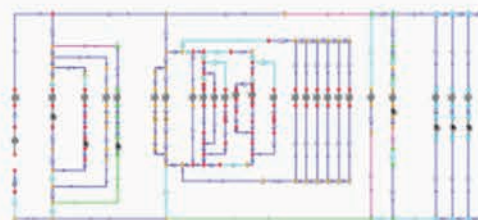
# Detail systems design calculation including piping and mechanical sizing

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

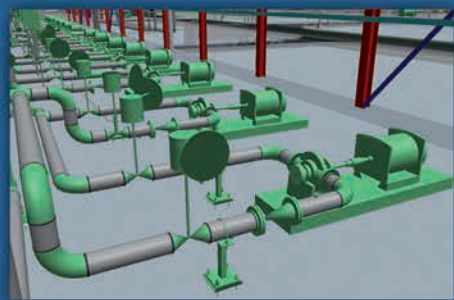
## MECHANICAL ENGINEERING SERVICES

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><b>Appendices</b></p> <p>Appendix A: Selection Steam Lines pressure Drop Power 1.7 output report</p> <p><b>ATTACHMENTS</b></p> <ol style="list-style-type: none"> <li>1. MHI Heat Source Diagram;</li> <li>2. Recommended End velocity chart, 1000-MHI-0001 Rev D;</li> <li>3. Header vents and drain system P&amp;ID 10071-1-MB-AP-0003, 10071-1-MB-AP-0004, 10071-1-MB-AP-0005, 10071-1-MB-AP-0006, 10071-1-MB-AP-0007 and 10071-1-MB-AP-0008</li> <li>4. AP system start line drawing</li> <li>5. Cold to hot steam system P&amp;ID 10071-1-MB-AB-0003 and 10071-1-MB-AB-0004</li> <li>6. Heat balance diagram for heater out of service cases</li> </ol>															
<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	CHKD	APPROVALS	
A	9/13/06	Issued for Review	SM	MM	MM	SM
B	11/1/06	Issued for Bank Review	MM	SH	PM	SM

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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	CHKD	APPROVAL	
0	9/4/06	ISSUED FOR BIDS	MF	SS	SS	EA

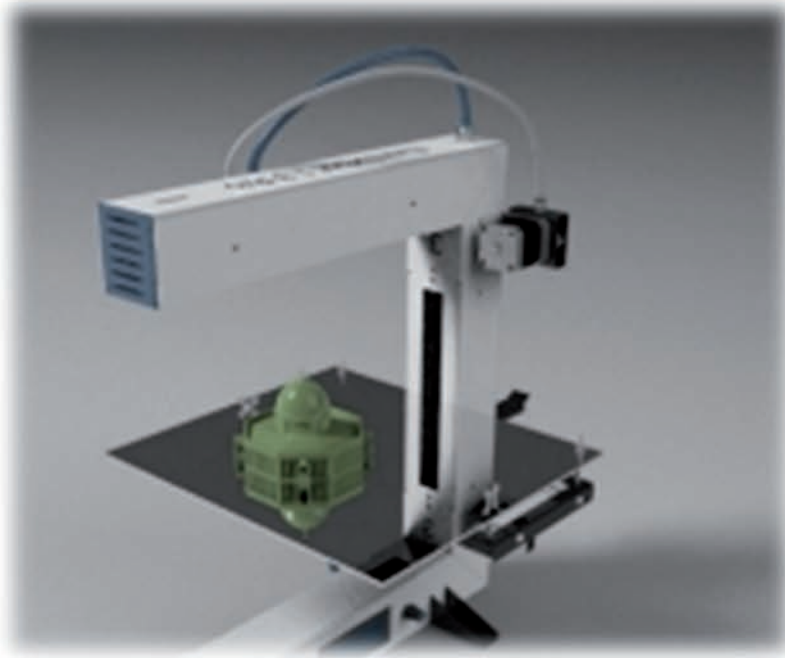
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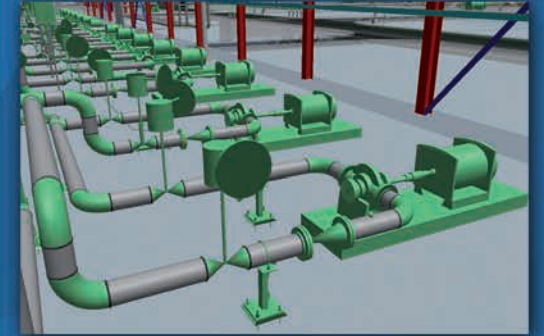


## MECHANICAL ENGINEERING TECHNICAL SPECIALISTS

- . 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.

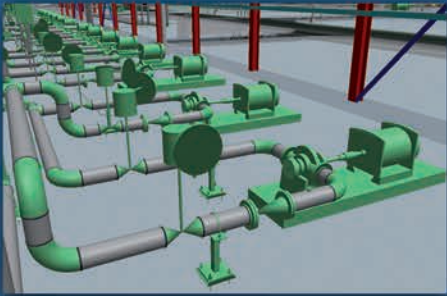


## MECHANICAL ENGINEERING SERVICES





## 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

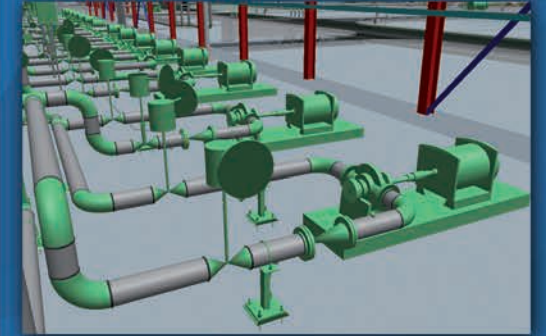


### **Performance Test Group**

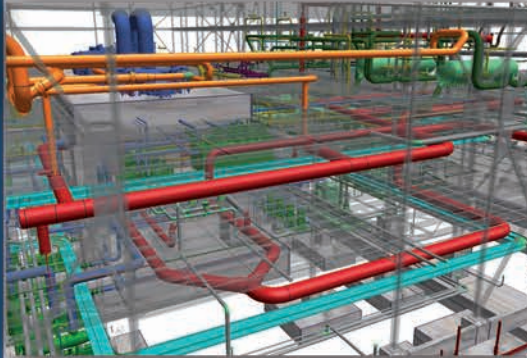
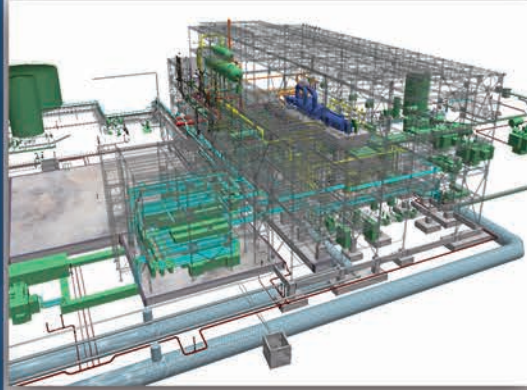
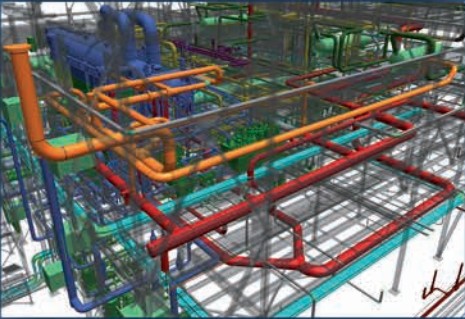
- Prepare Plant Performance Test Protocol Using ASME PTC or Other International Codes.
- Review Performance Test procedure Provided by Contractor.
- Witness units Performance Test.
- Analyze Output Data.
- Prepare and Issue Reports.

### **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.



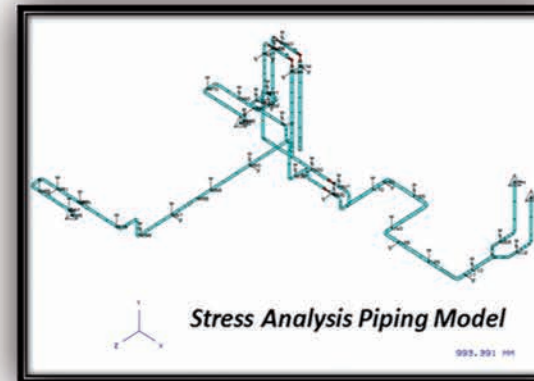
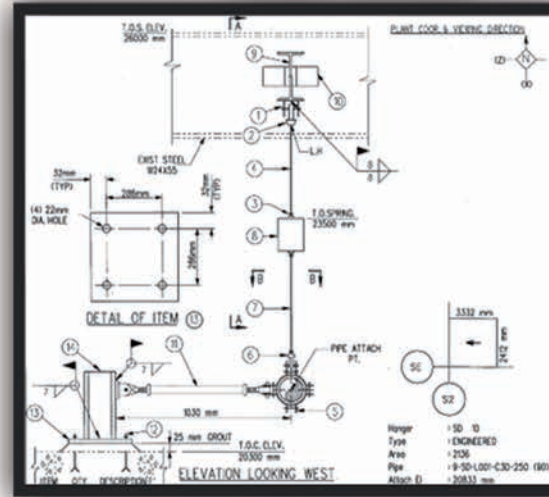
## STRESS ANALYSIS

- 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 .

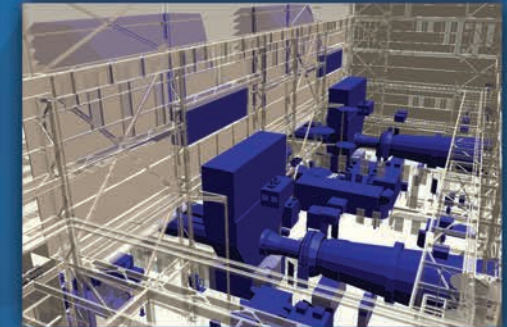
## PIPE SUPPORT DESIGN

- 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

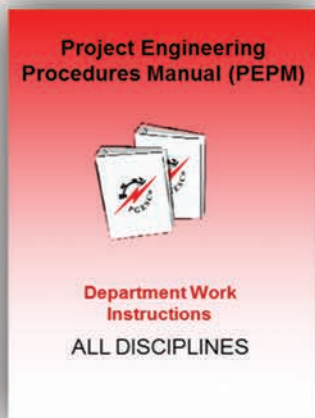
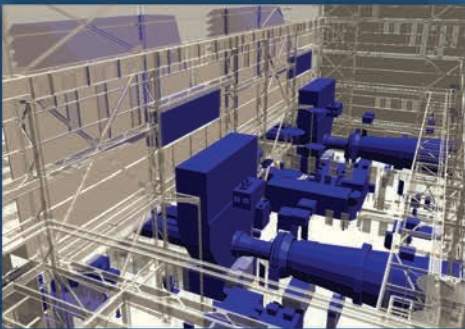


## PLANT DESIGN





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

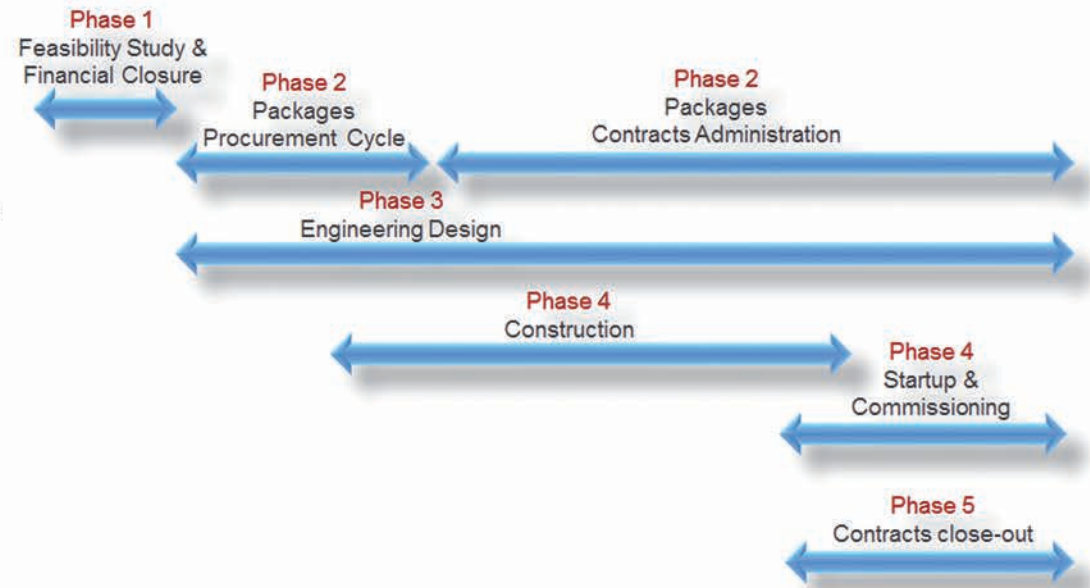




## PROJECT CONTROLS SERVICES:

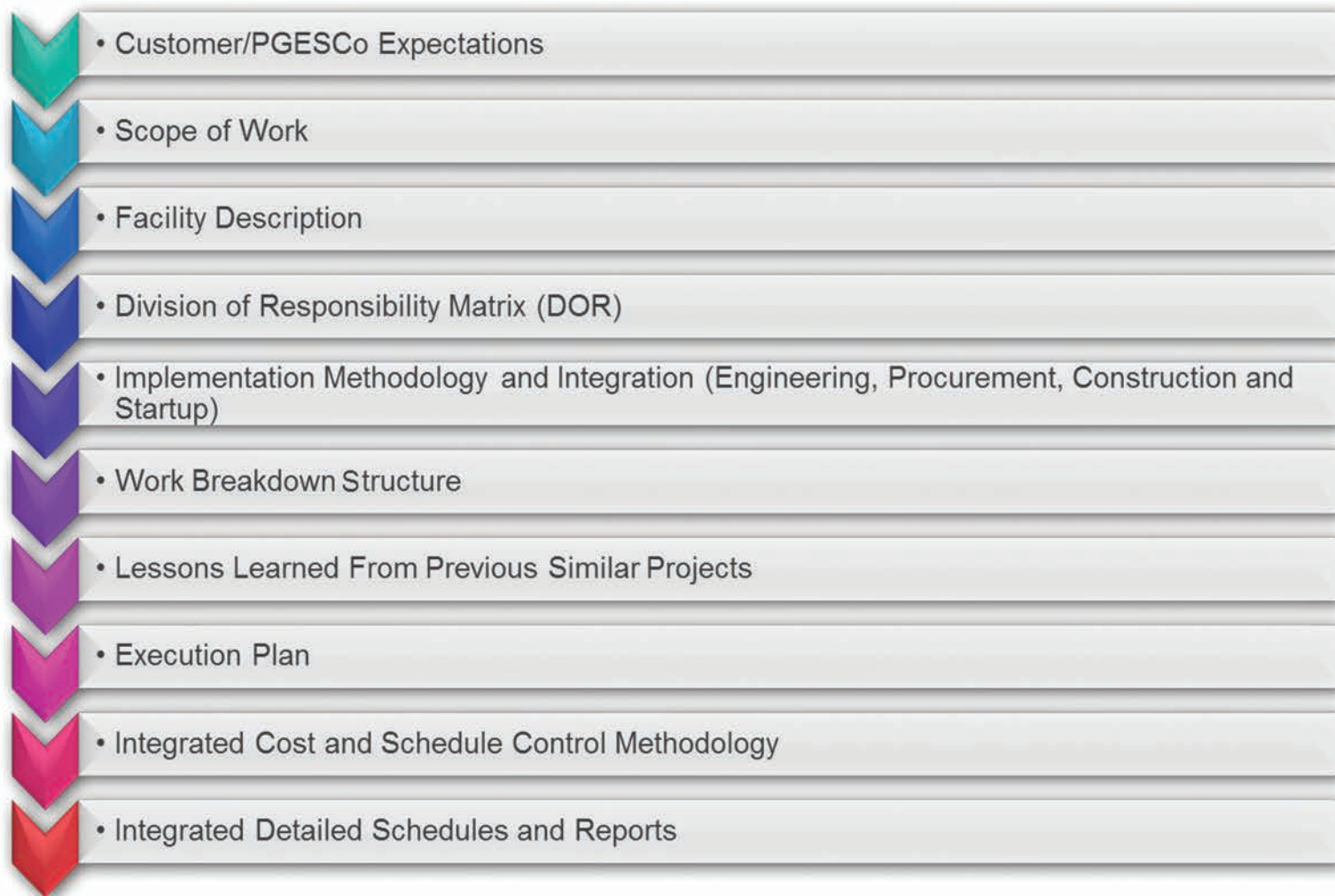
- Planning and Scheduling
- Project Cost
- Estimating
- Monitoring and Reporting

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



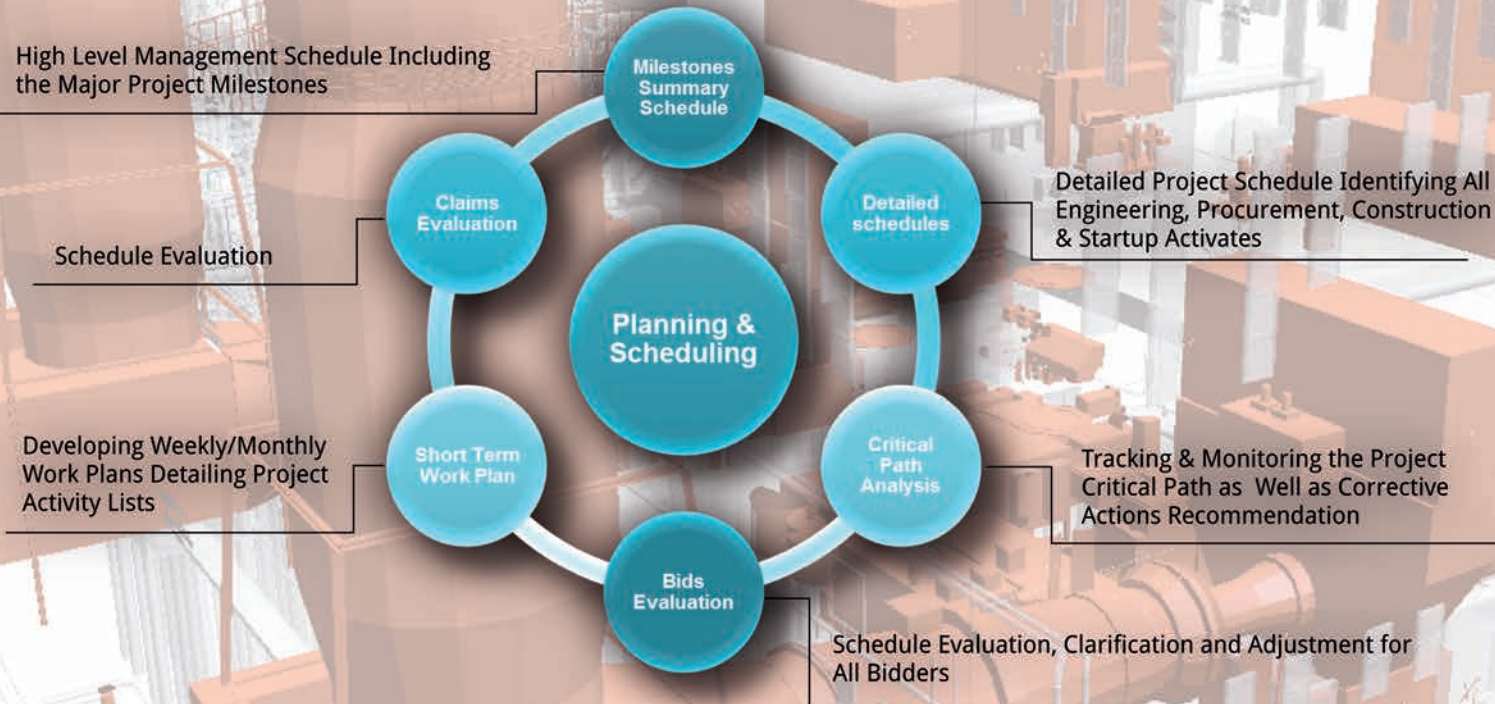


## PLANNING PROCESS



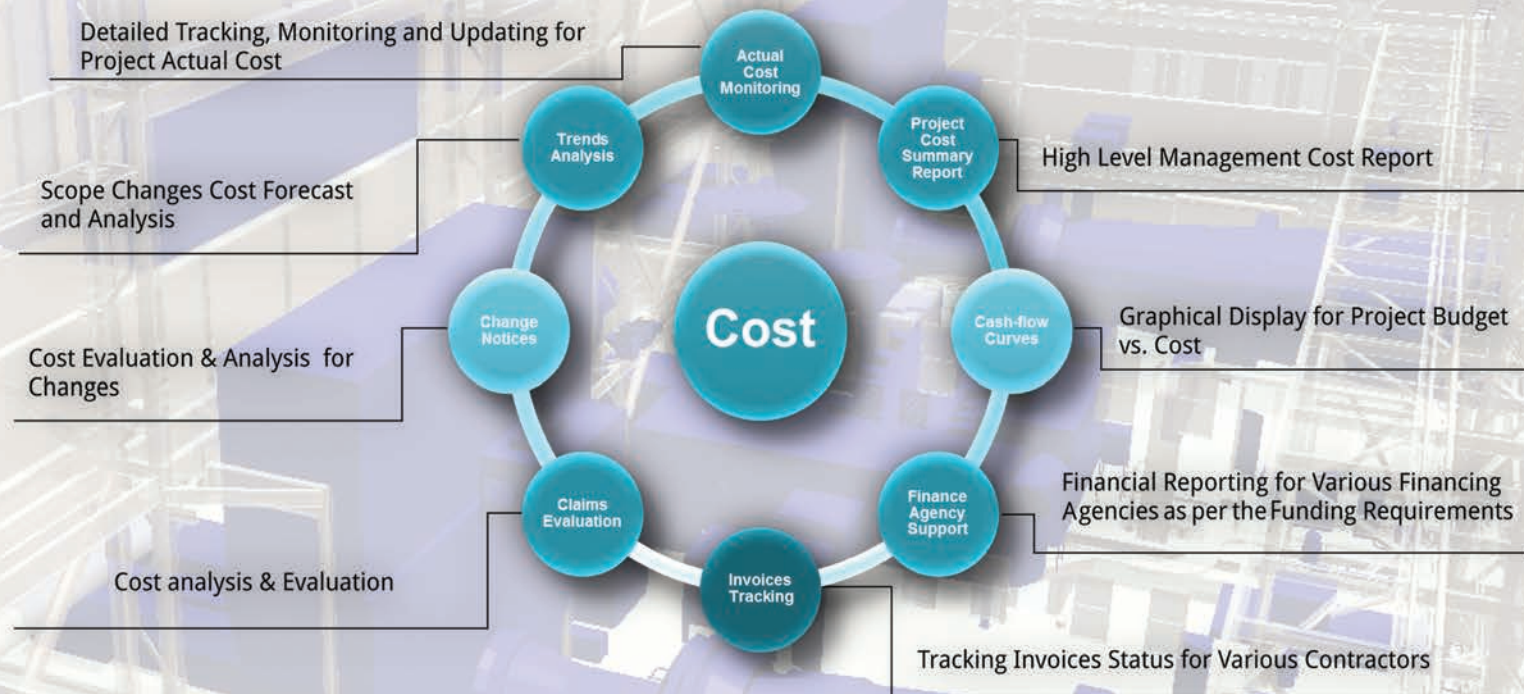


## PROJECT CONTROLS PLANNING & SCHEDULING



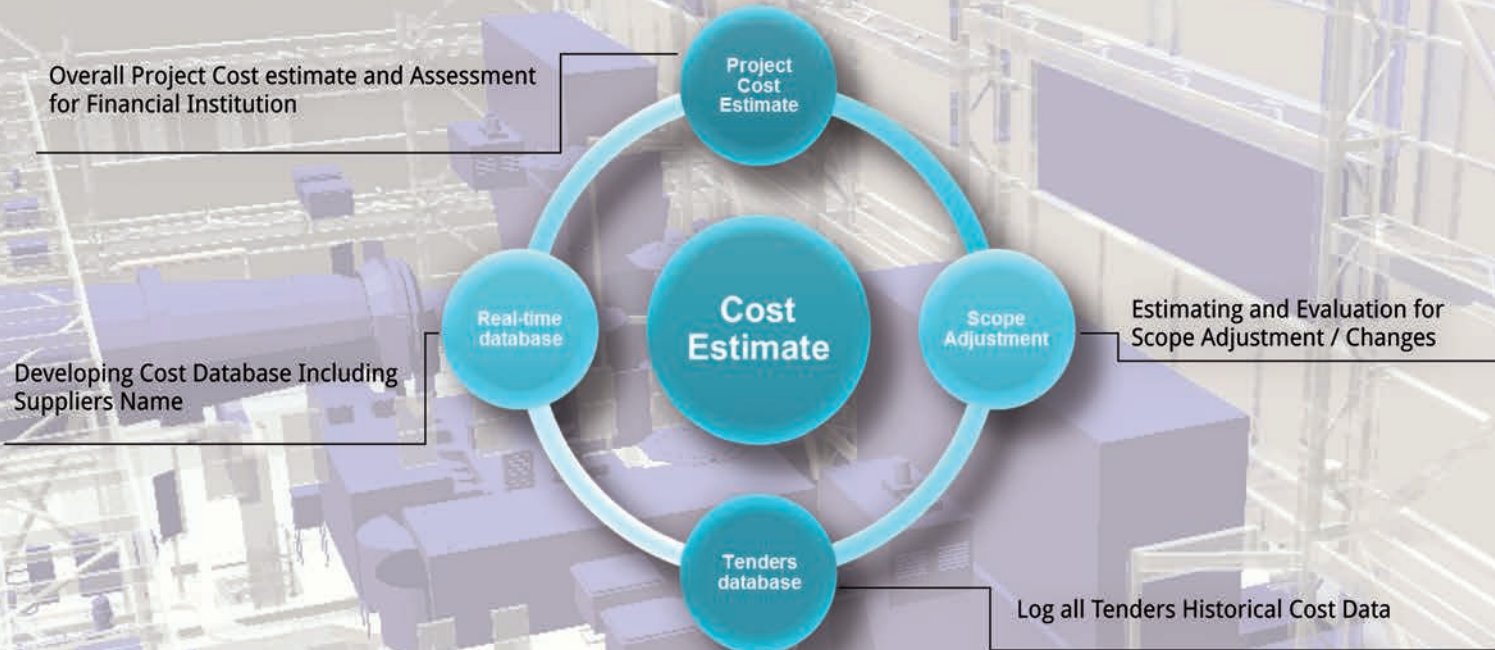


## PROJECT CONTROLS COST CONTROL





## 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.**

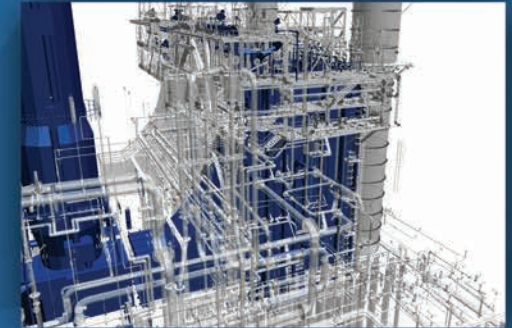
### CONSTRUCTION MANAGEMENT

- . 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**

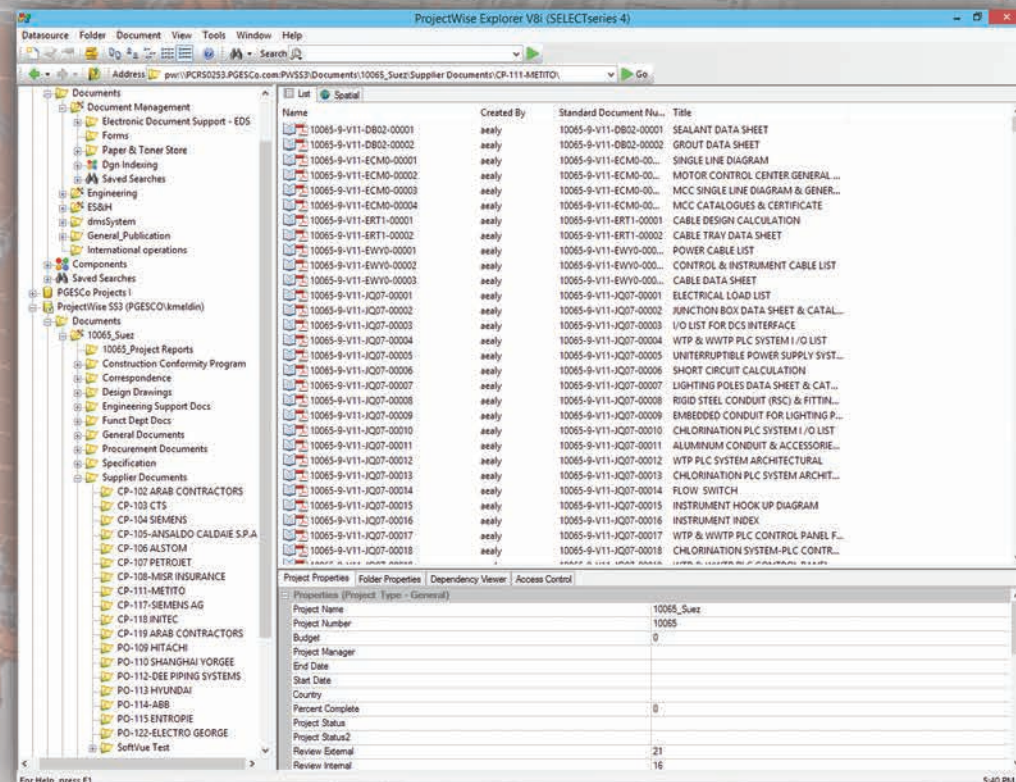
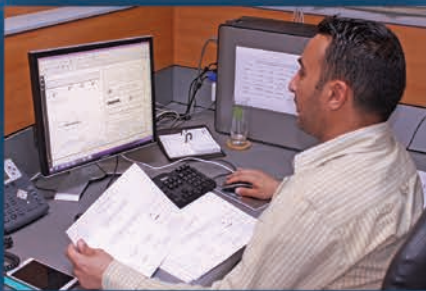
Program Captures Lessons Learned for Running Jobs to be Utilized in Future Jobs Enhancement and Improvements.





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



- . 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



AFRICAN DEVELOPMENT  
BANK GROUP



THE WORLD BANK  
Working for a World Free of Poverty



European  
Investment  
Bank



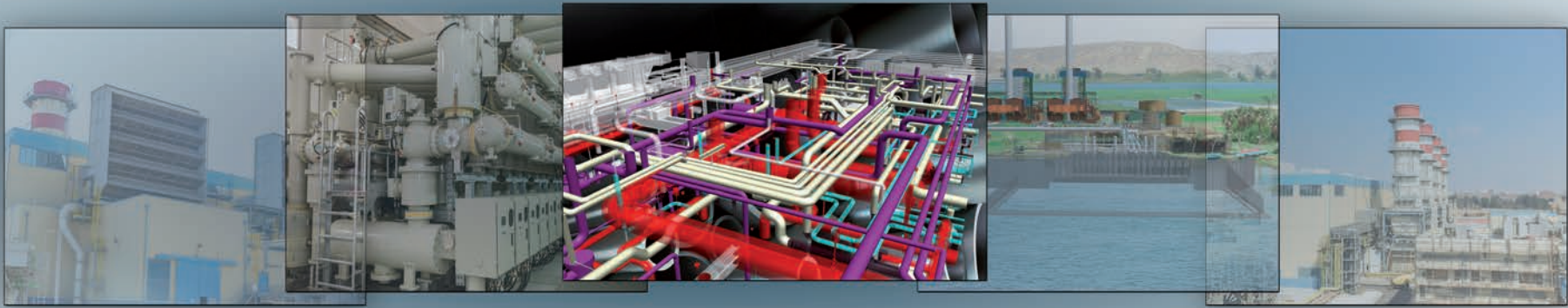
صندوق أبوظبي للتنمية  
ABU DHABI FUND FOR DEVELOPMENT



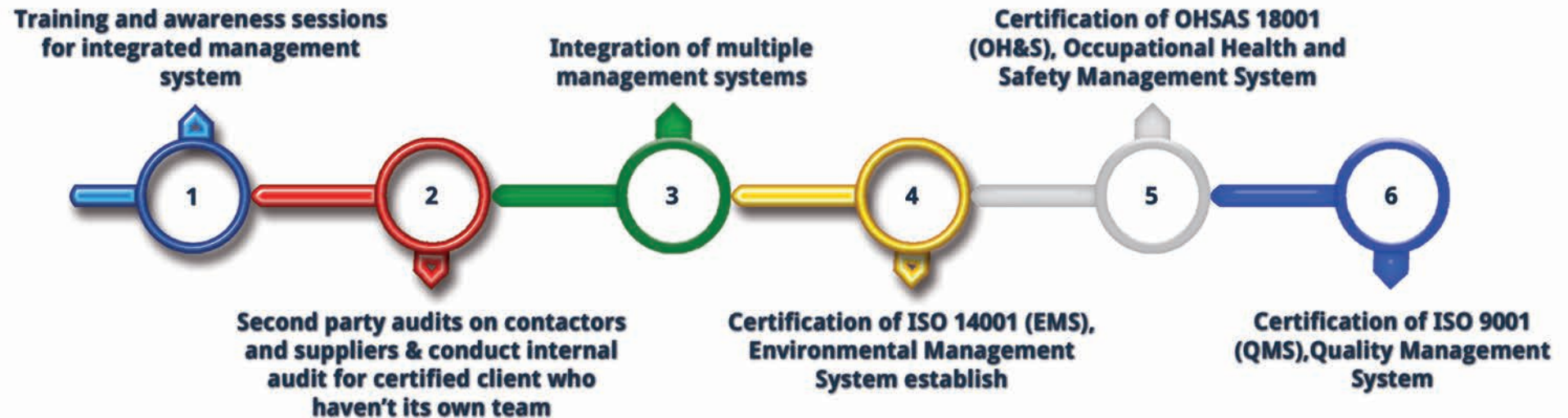
Islamic Development Bank  
Together We Build A Better Future



ARAB FUND FOR ECONOMIC  
& SOCIAL DEVELOPMENT

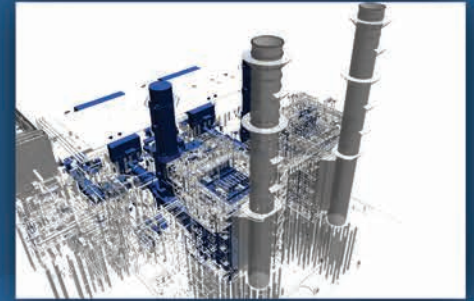
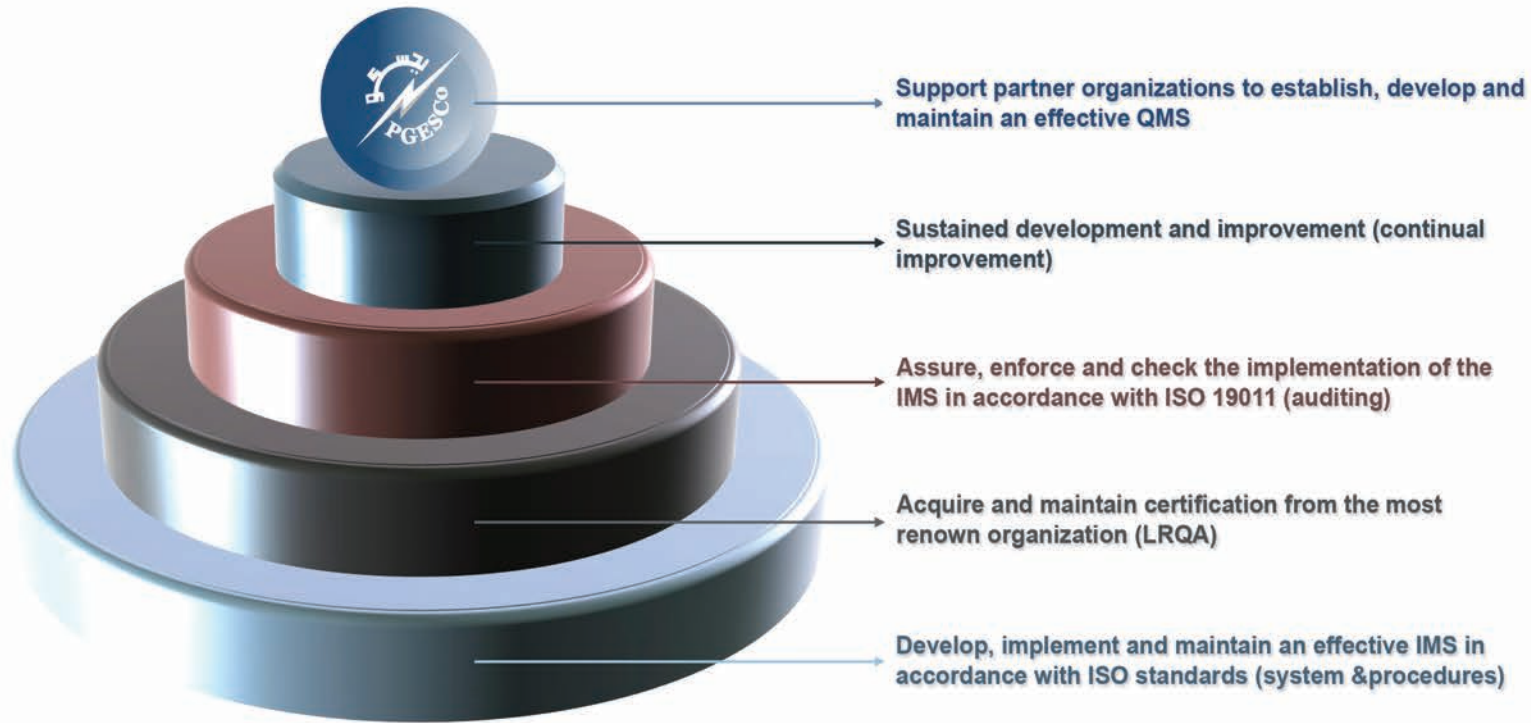


## QUALITY MANAGEMENT



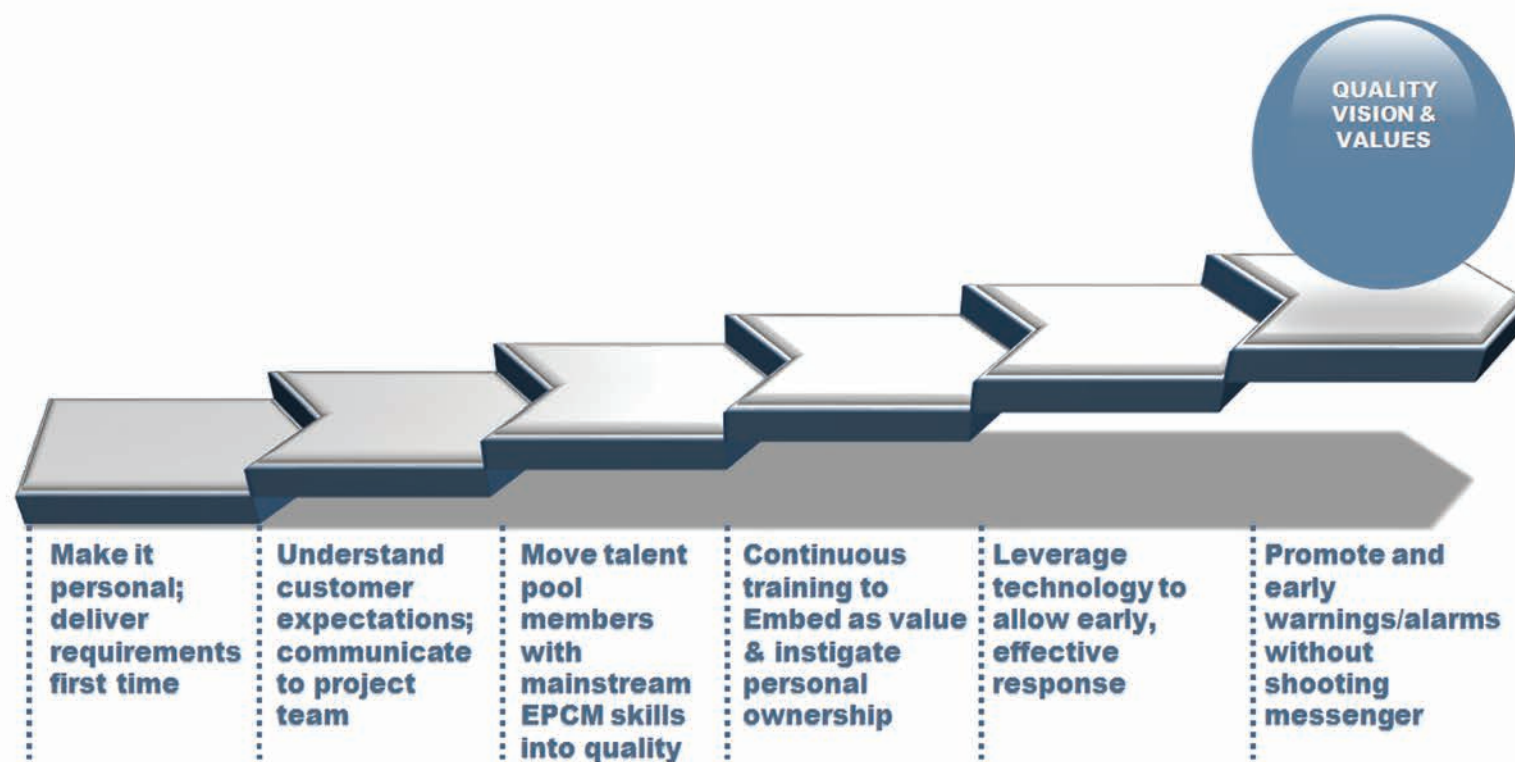


## QUALITY MANAGEMENT MISSION

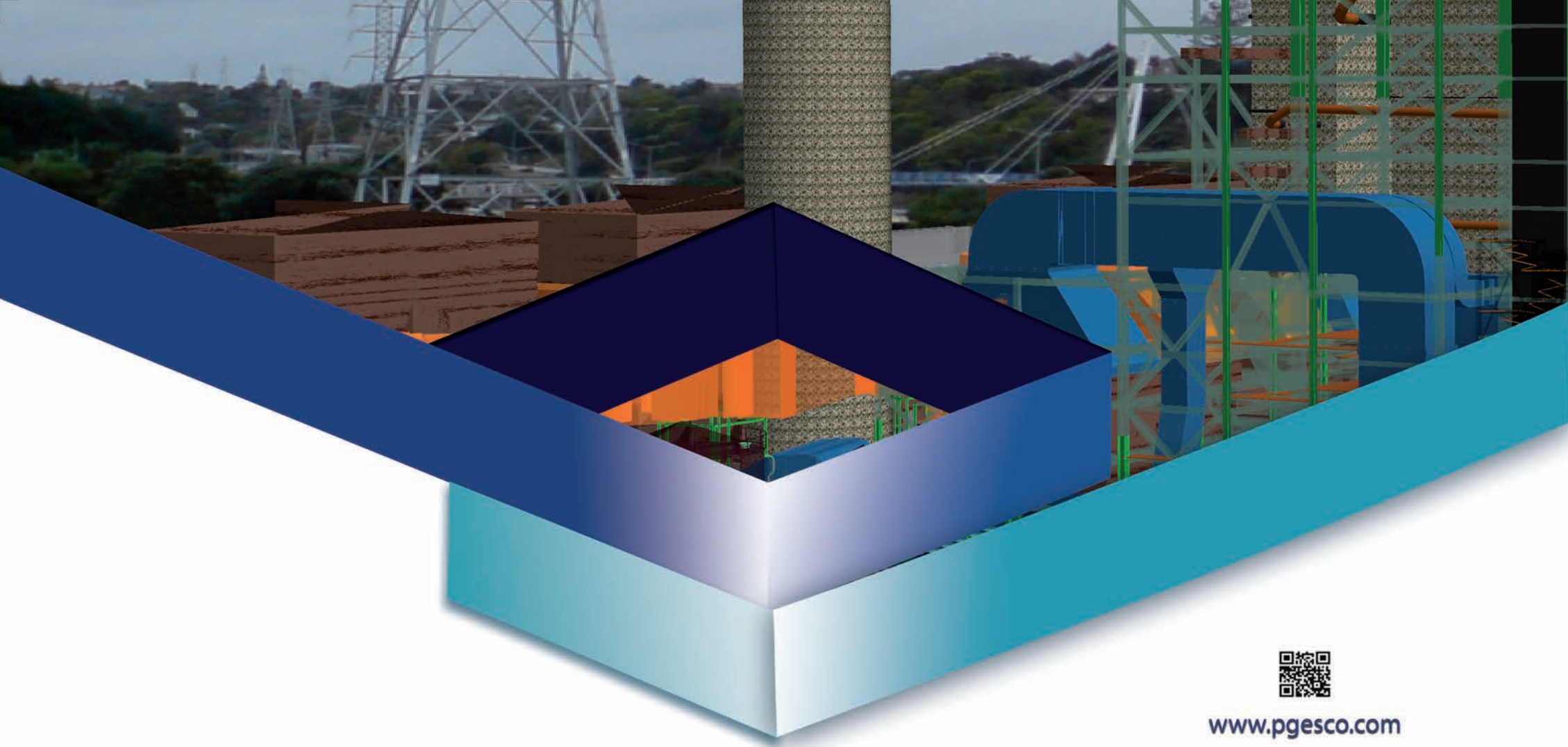






## QUALITY MANAGEMENT VISION & VALUES







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