



COMPANY PROFILE

CAZ (Thailand) Co., Ltd.

MAY. 2018



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1

Intro Introduction



As of **February 2014**, CAZ (Construction A to Z) Company has established from executives and managerial **staffs who has extensive experiences and has completed numerous project as a well recognized EPC contractor in Oil & Gas, Petrochemical, Chemical, Energy, Power plants segments.**

Focusing on EPC and Fabrication works, we certainly would have an edge over other competitors since we have being executed and achieved successfully in many project in Thailand as by a delivery in-time management and program to minimize all losses but maximize quality **at a shortest period concerned.**

With our extensive experience, **CAZ (Thailand) Co., Ltd. has been launched since February 2014 as the company name represent for "CONSTRUCTION A TO Z"**



CONSTRUCTION A TO Z 's major business range is Construction Total Service & Management System (Procurement ,Construction and Shop Fabrication) to provide clients with the best possible service in all phases of project from A to Z including Civil & Architectural, Structural, Tank & Vessel and Heaters Fabrication work, Piping & Mechanical erection, Electrical, Instrument work regardless of project amount.

Company Name	CAZ (Thailand) Co., LTD.
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CEO	Hong, Chung Sik
Established Date	06. Feb. 2014
Area	Land : 172,000m ²
	Shop : 30,000m ²

No. of Staff	
EPC Biz Div.	206
Shop Biz Div.	23
Supporting Div.	19
Marketing	3
Total	251

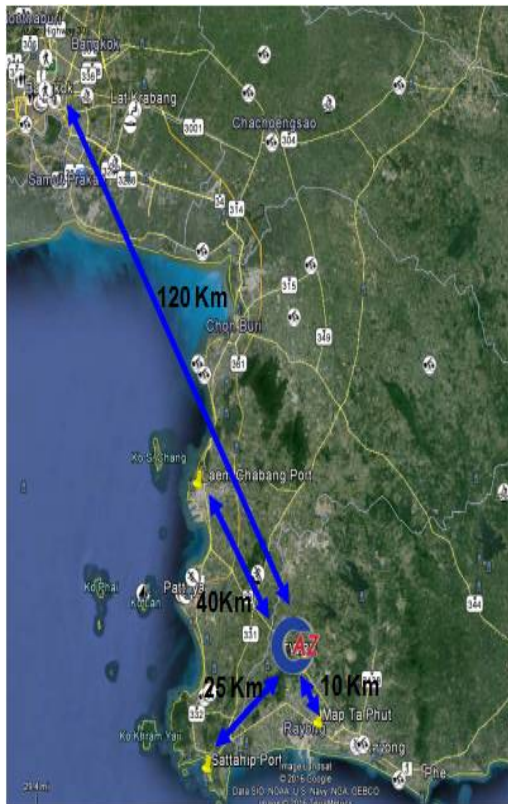
Office & Fabrication Shop

239 Huaypong-Nongbon Road, T. Huaypong A. Muangrayong 21150, Thailand.
 Tel : +66(0)38-606-242, Fax : +66(0)38-606-166

Intro Introduction

LaemChaBang	Sattahip	MapTaPhut
40 Km	25 Km	10 Km

- Office & Fabrication Shop
: Total Area(172,000 m²), Shop (30,000 m²)



2

Business



Business Area & Management System

2. Business Area & Management System



EPC Project

Engineering

Construction

Procurement

Business
Portfolio

Shop Manufacturing

Shop Fab.

- Piping & Steel Structure
- Furnace & Heater

**Vessel & H/Ex
Fabrication**

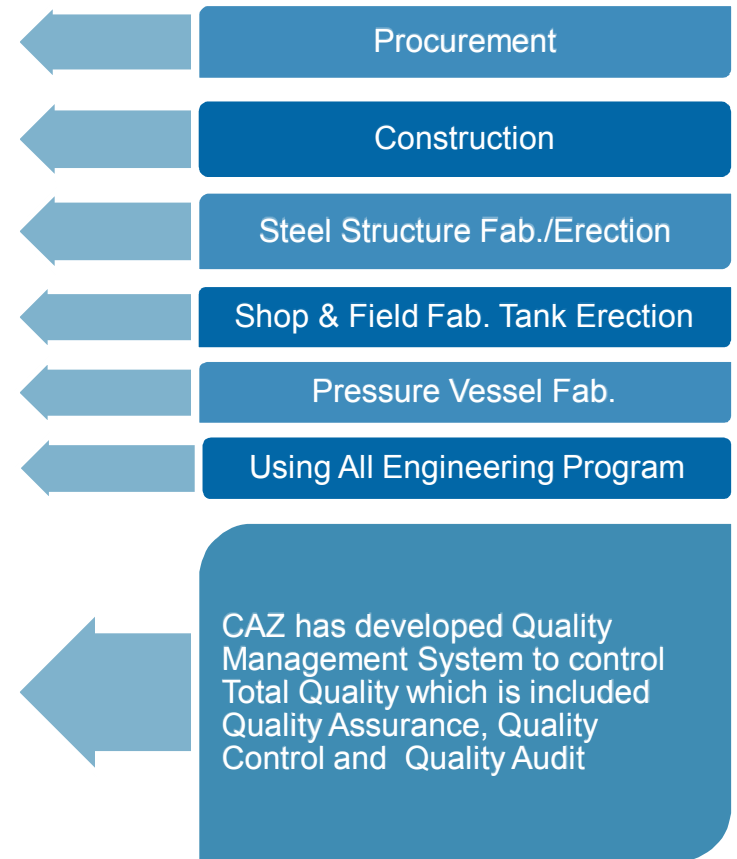
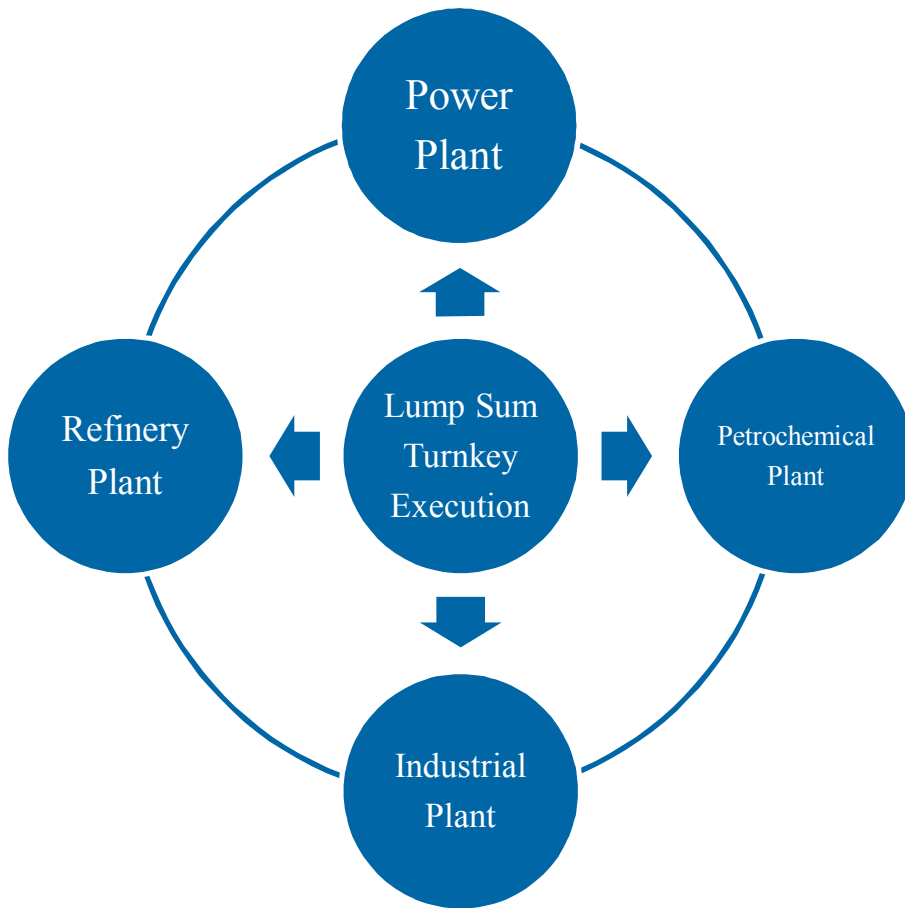
**Tank
Fab & Erection**

- CRT, DRT, FRT
- SPHERICAL

2. Business Area & Management System



CAZ's Market and Services



2. Business Area & Management System



Total Construction Service

CAZ's unique Construction(Construction & Procurement & Shop Fabrication) system was created to provide clients with the best possible service in all phases of project planning, feasibility studies, procurement, construction management, shop fabrication, commissioning, operation and maintenance.

Project Management System

Our company provides clients with flexibility in project organization and custom-tailors services to the requirement of each individual project. The most efficient organization is designed and mobilized with a team of qualified experts for each task and discipline.

All key staffs possesses specialized knowledge and expertise and has been specially trained to understand clients' needs and to communicate with clients effectively to achieve the best possible results.



2. Business Area & Management System



Team Work for Quality Management

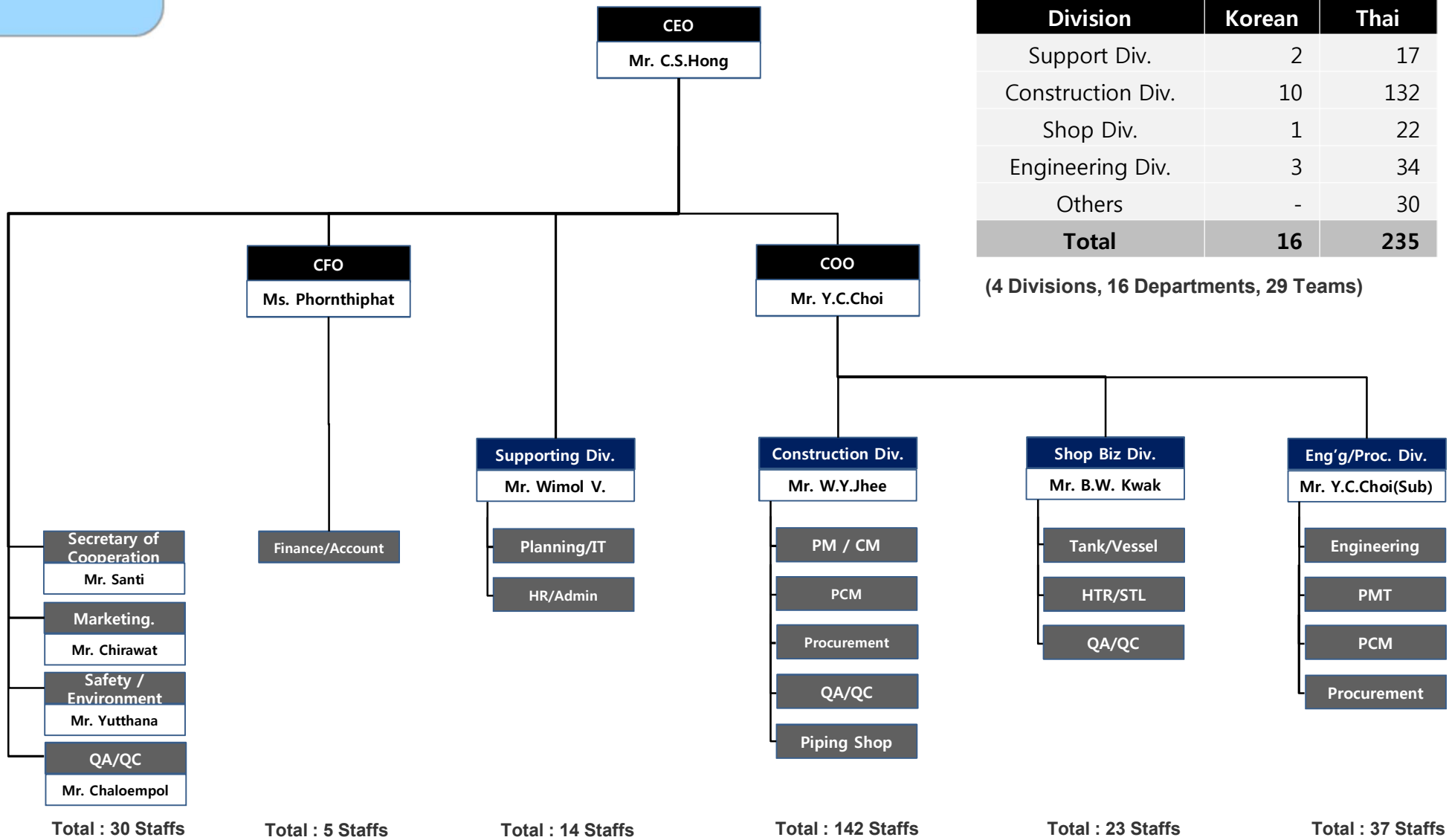
The team work strategy is the one of CAZ's management methods which focuses every resources of the company on each project.

TEAM stands for **T**ogether **E**veryone **A**chieves **M**ore. Therefore, TEAM Building with the clients is the most important aspect for every projects. CAZ instigates, assists and monitors each project with Quality Management Policy.

- ✓ **“CAZ” plan, do for client satisfaction.**
- ✓ **“CAZ” always deliver quality on time.**
- ✓ **“CAZ” are the best on Quality, Service and Price.**



Organization Chart



Total : 30 Staffs

Total : 5 Staffs

Total : 14 Staffs

Total : 142 Staffs

Total : 23 Staffs

Total : 37 Staffs

Division	Korean	Thai
Support Div.	2	17
Construction Div.	10	132
Shop Div.	1	22
Engineering Div.	3	34
Others	-	30
Total	16	235

(4 Divisions, 16 Departments, 29 Teams)

Man Power Mobilization Capacity

DICIPLINE	MAX. MOB. CAPABILITY
CIVIL / ARCH.	1,100
STRUCTURE FAB.	500
PIPING	800
STRUCTURE / MECH . INSTALLATION	400
ELEC. / INSTRUMENT	700
PAINT / SCAFFOLDING	300
TOTAL	3,800



5

Experience



Project Experience

of CAZ(Thailand) Co., Ltd.

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
Thai Oil LAB PJT	Thai Oil Company Limited / Hyundai Eng'g Co., Ltd. / Sriracha	Building Work (Recycle and Make Up Gas Compressor Shelter, Recycle Compressor Shelter, Air Compressor Shelter, Chemical Injection Package Shelter, Substation, Field Auxiliary Room, Gantry Shelter, NG Metering Station Shelter, Expansion of Flow Computer Building) Civil Work (Duct Bank and etc) Structure Fabrication & Field Erection Pipe Rack, Equipment Structure, Compressor Shelter (2,000 tons) Platform & Ladder Fabrication for Vessel & Tower (305 tons)	S May. '14 F Aug. '15	313 M
GSP#5 PJT WHRS Unit	PTT Public Co., Ltd. / Samsung Eng'g Co., Ltd. / Map Tha Phut	Structure & Mechanical & Piping Work For WHRS Unit	S May. '14 F Sep. '14	31 M
KHAO BO YA LPG TERMINAL PJT E&I Work	PTT Public Co., Ltd. / Samsung C&T Co., Ltd. / Khao Bo Ya	Electrical & Instrument Work of Refrigerated Tank Facilities	S Sep. '14 F Jan. '16	198 M
PLE Purple Line Building Facade	Power Line Engineering /BKK	Building Façade Work Structure Fabrication & Field Erection	S Sep. '14 F Apr. '15	22 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
TOP 202MW Small Power Producer PJT Building Package	Thai Oil SPP Co., Ltd.(TOP) / CTCI(Thailand) Co., Ltd. / Sriracha	Building Work , Substation, GTG Control Building, STG Control Building	S Sep. '14 F Jan. '16	197.0 M
PTT LNG Receiving Terminal Expansion PJT Phase II	PTT LNG Co., Ltd. / IHI Corporation / POSCO Engineering Co., Ltd. / Map Ta Phut	Civil Work , Equipment Foundation, Pipe Rack Pre-casting, Road Paving, Drainage Work Structure Fabrication & Field Erection Pipe Rack, Shelter, Platform (2,100 tons)	S Nov. '14 F Dec. '16	382 M
PTTGC Aromatic Debottlenecking Project	PTT Global Chemical / PTT ME / Map Ta Phut	Field Piping Work (20,000 DB) & Structure Work	S Apr. '15 F Oct. '15	62 M
PTTME Annapurna Project	Vencorex Chemicals / PTTME / Map Ta Phut	Steel Structure Installation Work (400 Tons)	S May. '15 F Jul. '15	6 M
PTT ASAHI SAR Project	PTT ASHAI / Map Ta Phut	Civil, Structure, Equipment Erection & Piping work	S Jul. '15 F Dec. '15	EPC 19 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Remark
TSE ATV Project	Samsung Electronic / Samsung Engineering / Sriracha	Civil, Structure Work	S Feb.'16 F Jun.'16	113 M
IRPC PPE Project	IRPC / Rayong	Civil and Electric Work	S Feb.'16 F Dec. '16	83 M
PTT Midline compressor project	PTT / CPP / Khao hin son	Civil,Structure, Equipment Erection & Piping, E&I , Pre-comm. & Commissioning Work	S Apr. '16 F Apr. '17	480 M
PTTGC TA Project	PTTGC / Rayong	Piping Hot (PPH) and Piping Cold (PPC) Repair Work	S May.'16 F Jun. '16	15 M
PTT Tank Terminal	PTT Tank / Map Ta Phut	4,000 Ton Propylene Spherical Tank and Facilities (EPC Project)	S Dec.'16 F Aug.'18	EPC 332 M
PTT LNG 1.5 MTPA	PTT LNG / POSCO / Map Ta Phut	Civil Work	S Jan.'17 F Jun.'17	31.1 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Contract Amount
PTT LNG Cold Water Facilities	PTT LNG / Map Ta Phut	Procurement, Construction and Commissioning of Cold water Facilities Project (Procurement, Construction & Commissioning)	S May.'17 F June.'18	EPC 721 M
Wangnoi Compressor Station Project	PTT / Samsung Eng'g / Wangnoi, Ayutthaya	Civil, Structure, Mechanical and Piping at Wangnoi Gas Compressor Station	S June.'17 F Oct. '18	372 M
PTT GC Site Preparation work Project	PTT GC / Samsung Eng'g / Map Ta Phut	Site Preparation Work	S Sep.'17 F Jant. '18	58 M
PTT LNG IPG Project	PTT LNG / Samsung Eng'g /Map Ta Phut	General Contractor (Civil, BLDG, Structure, Mechanical, Piping, Electric & Instrument, Painting Work)	S Feb.'18 F Jan. '19	220 M
PTT GC PO Project	PTT GC / Samsung Eng'g / Map Ta Phut	Civil Work	S Feb.'18 F Dec. '19	456 M
Enclosed Ground Flare (EGF) Installation Project	Bangchak Petroleum / Zeeco / Bangchak	Ground Flare and Facilities Project	S Apr. '18 F Jun. '20	EPC 272 M

5. Project Experience



Figure : Project Amount in million THB

Project	Owner/Client /Location	Description	Period	Contract Amount
PTT GC Olefin Reconfiguration Project	PTT GC/ Samsung Eng'g / Map Ta Phut	Structure Fabrication Work (6,060 tons)	S Mar.'18 F Feb.19	297 M
PTT GC Olefin Reconfiguration Project	PTT GC/ Samsung Eng'g / Map Ta Phut	Structure Erection (6,320 tons) , Equipment Erection (9,750 tons) and Piping Work (397,000 DB) including Pipe rack Module work (33 sets, 2,890 tons)	S Mar.'18 F Apr. '20	823 M

5. Project Experience

- TLAB PJT Build / Civil Work



Contract Amount : 313 Mil THB



- Substation BLDG
- FAR BLDG
- Recycle and Make Up Gas Compressor Shelter
- Recycle Compressor Shelter
- Air Compressor Shelter
- Chemical Injection Package Shelter
- Field Auxiliary Room Gantry Shelter
- NG Metering Station Shelter
- Expansion of Flow Computer Building
- **Work Period : May. '14 ~ Aug. '16**

Major Work Volume

- Excavation : 9,637 m³
- Form Work : 14,921 m²
- Rebar Work : 713 Tons
- Concrete Work : 5,523 m³
- PVC Pipe Work : 9,000 m³
- Masonry Work : 2,502 m²
- Painting Work : 8,200 m²
- Tile Work : 1,230 m²
- Roofing Work : 2,082 m²



5. Project Experience - TLAB PJT Structure Fab. & Erection / Platform & Ladder Fab.



Contract Amount : 313 Mil THB



Total : 1,400 Tons

- Pipe Rack(Unit 58300) : 720 Tons
- Pipe Rack(Unit 58200) : 670 Tons
- Shelter Structure : 500 Tons
- **Work Period : May. '14 ~ Aug. '16**

Sets of Platform/Ladder 36 sets for Column, Reactor and Vessel (Total : 305 Tons)

- Platform : 136 Tons
- Handrail & Ladder : 96 Tons
- Grating : 73 Tons
- **Work Period : Jun. '14 ~ Jan. '15**



5. Project Experience



- GSP#5 PJT WHRS Unit

Contract Amount : 31.1 Mil THB



Installation of Waste Heat Recovery

- Heater : Total 620 Tons
- Include Fuel Gas Skid, Blowers

Fabrication & Erection of Piping

- Total 3,000 DB

Painting Works

Work Period : May. '14 ~ Sep. '14

5. Project Experience

- KHAO BO YA LPG Terminal PJT E&I work



Contract Amount : 200 Mil THB



Total : 285,781 M

- Electrical : 310,000 M (Cable length)
- Instrument : 320,000 M (Cable length)
- **Work Period : Sep. '14 ~ Jan. '16**

Electrical

- Electrical Construction Management
- Supply labors, Consumables, equipment and tools for Construction Works
- Electrical Equipment Installation Works
- Cable Tray Works
- Lighting Fixture Installation Work
- Support Fabrication and Installation
- Cable Laying
- Cable Test and Termination
- Pre-Commissioning Work

Instrument

- Electrical Construction Management
- Supply labors, Consumables, equipment and tools for Construction Works
- Instrument System Installation Works
- Cable Tray Works
- Instrument Calibration Works
- Instrument Installation Works
- Support Fabrication and Installation
- Cable Laying
- Cable Test and Termination
- Pre-Commissioning Work



5. Project Experience

- PLE Purple Line Building Facade

Contract Amount : 21.6 Mil THB



Total : 390 Tons

Work Period : Sep. '14 ~ Apr. '15

PR1

- Bang Yai Park & Ride
- 146 Tons

PR2

- Tha It Park & Ride
- 117 Tons

PR3

- Yeak Nonthaburi Park & Ride
- 46 Tons



5. Project Experience

- TOP 202MW Small Power Producer PJT Building Package

Contract Amount : 197.0 Mil THB



- Substation 80
- Substation 81
- GTG Control BLDG 2EA
- STG Control BLDG 2EA
- **Work Period : Sep. '14 ~ Jan. '16**

Major Work Volume

- Pile Cutting : 471 ea
- Excavation : 1,014.00 m³
- Back Fill : 537.00 m³
- Rebar : 375.04 Tons
- Form Work : 19,050.50 m²
- Concrete Work : 2,181.00 m³
- Demolition Work : 175.09 m³
- Masonry Work : 4,288.50 m²



5. Project Experience- PTT LNG Receiving Terminal Expansion PJT Civil & STR. Work



Contract Amount : 382 Mil THB



- BOG Compressor Shelter
- HP LNG Shelter
- Send-Out Compressor Shelter
- BOG Operation Station
- Utility Station
- **Work Period : Nov. '14 ~ Mar. '16**

Major Work Volume

Civil Work

- Excavation : 16,852.98 m³
- Back Fill : 13,460.01 m³
- Concrete : 5,991.78 m³
- Rebar : 950.55 Tons
- Form Work : 21,324.44 m²
- Pile Head Cut : 611 ea
- Asphalt Paving : 493.90 m³
- Concrete Paving : 1,799.52 m³
- Demolition Work : 175.09 m³
- Painting Work : 2,924.96 m²

5. Project Experience- PTT LNG Receiving Terminal Expansion PJT Civil & STR. Work



Contract Amount : 382 Mil THB



STR. Work : Total 2,000 Tons

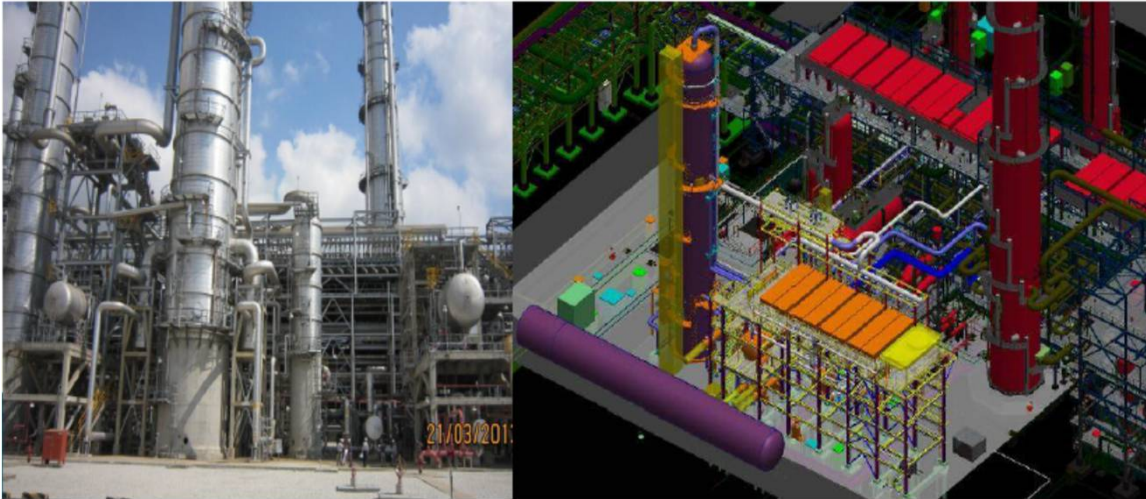
- Process Structure : 1,500 Tons
- Cable Tray Support : 500 Tons



5. Project Experience

- PTT GC Aromatic Debottlenecking PJT Piping Work

Contract Amount : 61.7 Mil THB



Major Work Volume

- Field Piping Work 20,000 DB
- Piping Support 37 Tons
- Field Painting
- **Work Period : Apr. '15 ~ Oct. '15**



5. Project Experience

- PTT ME Annapurna PJT STR Work

Contract Amount : 5.9 Mil THB



Total : 400 Tons

- Equipment Structure : 350 Tons
- Stair Tower : 40 Tons
- **Work Period : May. '15 ~ Jul. '15**



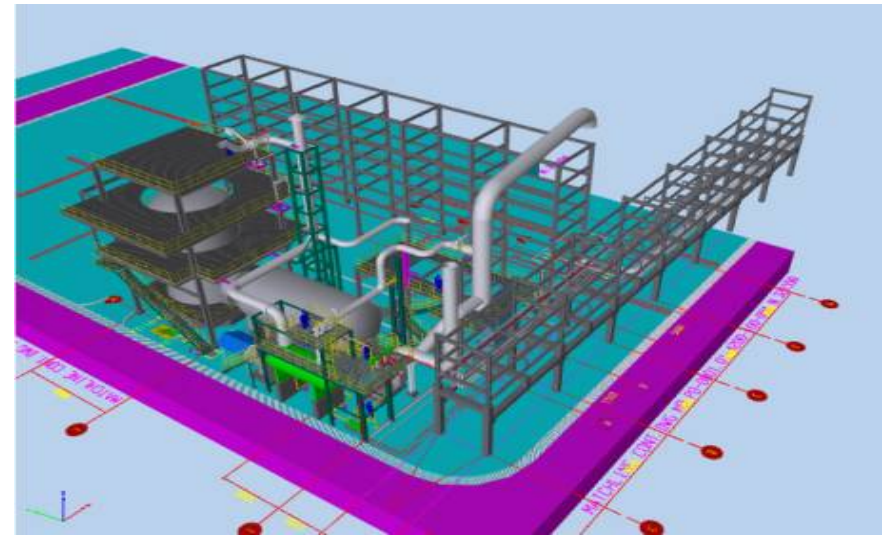
5. Project Experience

- PTT ASHAI SAR Emergency Vent Gas Project

Contract Amount : 18.6 Mil THB



- Civil, Structure, Equipment Work, Piping, Painting & Insulation
- **Work Period : Jul. '15 ~ Dec. '15**



5. Project Experience

- TSE ATV Project
Contract Amount : 112.6 Mil THB



Major Work Volume

- Civil
 - Excavation : 4,361 M3
 - Concrete : 4,483 M3
 - Re-bar : 300 Ton
- Structure
 - Total Volume : 726 Ton
 - Steel Structure : 604 Ton
- Work Period : Feb. '16 ~ Apr. '16



5. Project Experience

- IRPC PPE Civil & Electric Work



Contract Amount : 83.4 Mil THB



Major Work Volume :

Civil Work

- Excavation : 4,240 m³
- Form Work : 8,678 m²
- Rebar Work : 480 Tons
- Concrete Work : 2,458 m³
- **Work Period : Feb. '16 ~ Dec. '16**

Electrical Work

- 12,000 M (Cable Length)



5. Project Experience

- PTT Midline Compressor Station



Contract Amount : 480 Mil THB

Structure Fabrication & Erection



- Structure : 800 tons for Equip. STR, Pipe Rack & Platform, Ladder
- Equipment Work :
 - Turbine compressor 4 sets
 - Fire fighting system
 - Air compressor, flare stack, Gas filter, Pig launcher & Receiver, Slop Oil Tank and Nitrogen Package & etc.
- Piping (110,000 DB)
 - Heavy wall (18"~ 46"), General piping
- Painting, Insulation
- Electric & Instrument Work
 - Electric Cable 120,000 M, Instrument Cable 140,000 M



5. Project Experience

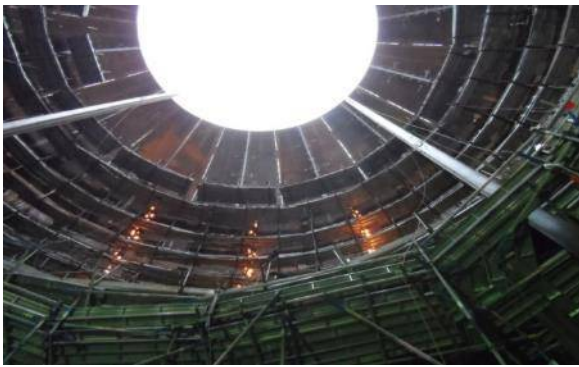
- PTT Midline Compressor Station Contract Amount : 480 Mil THB



5. Project Experience

- PTT Tank Terminal PP Spherical Tank and Facilities

Contract Amount : 332 Mil THB



- EPC Project for Propylene 4,000 ton capacity Tank (10,000m³, Dia 26.76 Meter, erection weight 1,482 ton, U2 Stamp), transfer pump and Ground flare
- Civil, Tank Fab & erection, Piping , Electric & Instrument Work

5. Project Experience

- PTT Tank Terminal PP Spherical Tank and Facilities

Contract Amount : 332 Mil THB



5. Project Experience



- PTT LNG Cold Water Facilities



Contract Amount : 729 Mil THB

- EPC Project for Cold Water Facilities (NG Heater, NG Vaporizer, Transfer Pumps, Tanks & F/F System)
- Civil, Structure, Piping, Electric & Instrument, Painting & Insulation Work



5. Project Experience

- PTT LNG Cold Water Facilities



Contract Amount : 729 Mil THB



5. Project Experience

- PTT Wangnoi Compressor Station

Contract Amount : 340 Mil THB



- Civil, Steel Structure, Piping, Mechanical Work, Painting & Insulation Work
 - Civil : Concrete 11,000m³
 - Steel Structure : 610 Tons
 - Piping : 56,000 DB
 - Mechanical Work : GTG Compressors, Ground Flare, Gas & Lube Oil Coolers, Inlet filters, fire fighting pumps, Air compressor station, fuel Gas Skid

5. Project Experience

- PTT Wangnoi Compressor Station

Contract Amount : 340 Mil THB



6

Execution
Capacity



Execution

Capacity of each Disciplines

6-1

Execution
Capacity



Civil & Building Discipline



6-1. Execution Capacity of **Civil & Building Discipline**



Civil Work

- Piling (Bored / Driven / Non-Pollution Pile)
- Equipment Foundation
- Tank Foundation (Concrete Type)
- Tank Foundation (Earth Type)
- Pre-Casting Concrete Pipe Rack
- Concrete Fire Proofing
- Water Storage Pond & Pit
- Concrete Dike & Earth Bund-wall
- U/G Drainage Manhole & Box
- Trench & U-Ditch with Grating Cover
- Pipe Support & Pipe Sleeper
- Cooling Tower (4 Cell Basin & Con'c structure)

Building Work

- Central Control Building
- Pelletizing Building
- Compressor Building
- Sub-Station Building

Manpower Mob. Capability : 1,100 Workers (Current 400 Workers)

6-1. Team Experience for **Civil & Building**



Year	Project Name	Volume
2013	Thai Oil EIPSA3 Project	Concrete : 5,500 m ³
2013	PTT SAIYOK Compressor Station 4 Project	Concrete : 1,350 m ³
2013	BangChak TGTU Project	Concrete : 1,020 m ³
2012	PTT Onshore Compressor Station #4 Project	Concrete : 15,020 m ³
2011	BST NB Latex Project	Concrete : 9,200 m ³
2010	PTT Tank Terminal Project	Concrete : 14,700 m ³
2009	PTT Chem EPS Power Plant	Concrete : 13,010 m ³
2009	PTTAR Clean Fuel Project	Concrete : 11,160 m ³
2008	PTT FRT Tank Project	Concrete : 1,520 m ³
2008	SCG THPP #3 Project	Concrete : 21,300 m ³
2008	MOC ARU Project	Concrete : 10,100 m ³
2008	PTT Chem Furnace, EOT & GHU Project	Concrete : 410 m ³
2008	PTT Chem Diversion Pit Project	Concrete : 990 m ³
2007	PTTAR Complex #2 Project	Concrete : 6,900 m ³
2007	PTTAR Diesel Tank Project	Concrete : 2,700 m ³
2006	PTTAR Condensate Tank Project	Concrete : 11,300 m ³

6-2

Execution
Capacity



Structure Discipline



6-2. Execution Capacity of “Structure Discipline”



Major Work

- Pipe rack, Equipment Structure & Shelter Structure Work
- Furnace & Heater Fabrication Work
- Platform & Ladder Fabrication Work
- Flare Stack Fabrication Work

Structure Production Capability : 50~60 ton/Day

Manpower Mob. Capability

- Total 500 Workers (Current 190 Workers)



6-2. Execution Capacity of “Structure Discipline”



- Automation Line for Structure Fab.



6-2. Team Experience for **Structure**



Year	Project Name	Volume
2013	PTT GSP 5 PJT	400 tons
2013	PTT Saiyok compressor Station Unit 4 PJT	350 tons
2012	BANGCHAK TGTU PJT	850 tons
2011	PTT Onshore compressor Station 4 PJT	1600 tons
2011	BST NB Latex PJT	1350 tons
2010	PTT Tank Terminal PJT	350 tons
2009	PTTAR Clean Fuel PJT	1,800 tons
2008	MOC Furnace Cracker PJT	9,800 tons
2008	SCG THPP #3 PJT	2,800 tons
2008	MOC ARU PJT	600 tons
2008	RRC Upgrading	1,600 tons
2007	PTT Chem Furnace	600 tons
2007	PTTAR Complex #2 PJT	450 tons
2006	ATC FRC Project	340 tons

6-3

Execution
Capacity



Piping Discipline



6-3. Execution Capacity of “Piping Discipline”



General Welding

- Carbon Steel Pipe
- A333 Gr. 1 & 6
- A335 P11 & P22/P91
- A312 TP304/304L, A312 TP316/316L
- A312 TP321H, A312 TP347H

Special Welding

- Carbon Steel Pipe
- KHR32C (Kubota Steel)
- 35Cr-45Ni
- 25Cr-35Ni
- 20Cr-32Ni

Piping Work Capability

- Shop Fabrication Work : 2000 DB/Day
- Field Erection Work : 2000 DB/Day

Manpower Mob. Capability

- Welders : 300 workers(Current 70 workers)
- Workers : 1200 workers(Current 240 workers)

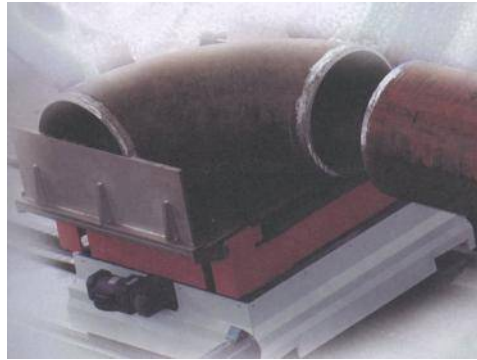
Dissimilar Welding

- A351-CF8C + SA 312 TP321H
- SA 312 TP321H + A335 Gr.P22
- KHR32C + Alloy 800H
- 35Cr-45Ni + 25Cr-35Ni
- SA 312 TP321H + 25Cr-35Ni
- 35Cr-45Ni + 20Cr-32Ni
- GX10NiCrNb3220 + 20Cr-32Ni
- 20Cr-10NiCb + SA 312 TP321H,347H

6-3. Execution Capacity of “Piping Discipline”



- Automation for Piping Fab.



Piping Cutting/ Beveling
MC : 12”~46” (5 sets)

Piping Fit up MC : 18”~46”

Piping Auto Welding MC
: 18”~46” (3 sets)

Hydraulic Bolt Torque MC
: 4 sets

6-3. Team Experience for Piping

Year	Project Name	Volume
2017	PTT Wangnoi Compressor Station	56,000 DB
2017	PTT LNG Cold Water Facilities Project	51,000 DB
2017	PTT Tank Propylene Tank Facilities Project	12,000 DB
2016	PTT Midline Compressor Station Project	124,000 DB
2015	PTT GC Debottlenecking Project	22,000 DB (Field Only)
2013	PTT GSP 5 PJT	42,000 DB
2013	PTT Saiyok compressor Station Unit 4 PJT	22,000 DB
2012	BANGCHAK TGTU PJT	38,000 DB
2011	PTT Onshore compressor Station 4 PJT	48,000 DB
2011	BST NB Latex PJT	90,000 DB
2010	PTT Tank Terminal Project	128,000 DB
2009	PTTAR Clean Fuel Project	180,000 DB
2009	PTT Chem. Power Plan	86,000 DB
2009	DOW Offsite Pipeline Project	120,000 DB
2008	MOC ARU Project	196,000 DB
2008	THPP#3	195,000 DB
2008	MOC Furnace Cracker Unit	65,000 DB

Total 900,000 DB for 2 year

6-3. Team Experience for Piping



Year	Project Name	Volume
2007	PTTAR Complex #2 Project	98,000 DB
2007	ROC Furnace Q Project	20,000 DB
2006	ATC FRC Project	55,000 DB
2005	ROC M4 Project	28,000 DB
2004	ATC Debottlenecking Stage 2 Project	45,000 DB

6-4

Execution
Capacity



Equipment Discipline



6-5. Execution Capacity of **Equipment**



Equipment Shut Down Work

- Replacement of Air Fan Cooler
- Re-tray work (UOP 3 to 4 tray, Packing tray & etc.)
- Heater Modification Work
(Burner replacement, Radiant Coil replacement Work)
- Heat Exchanger & Bundle Replacement Work
- Pump Modification Work
(Impeller, Motor, Pump replacement)

Special Equipment Work

- Reciprocating Compressor, Centrifugal Compressor Installation work
- Heater, Furnace Installation Work
- Rotating Pump Installation Work
- Cooling Tower, Clarifier Installation Work
- Air Fan Cooler assembly and Installation Work

Manpower Mob. Capability

- Workers : 400 workers

6-4. Team Experience for **Equipment**



Year	Project Name	Volume
2013	PTT GSP 5 PJT	29 sets/ 620 tons
2013	PTT Saiyok compressor Station Unit 4 PJT	10 sets/ 350 tons
2012	BANGCHAK TGTU PJT	45 sets/ 1,130 tons
2011	PTT Onshore compressor Station 4 PJT	50 sets/ 930 tons
2011	BST NB Latex PJT	483 sets/ 10,075 tons
2010	PTT Tank Terminal PJT	70 sets/ 2,470 tons
2009	PTTAR Clean Fuel PJT	90 sets/ 3,558 tons
2008	SCG THPP #3 PJT	12 sets/ 1,080 tons
2008	MOC ARU PJT	10 sets/ 1,200 tons
2008	MOC Furnace Cracker Unit	48 sets/ 4,300 tons
2007	PTTAR Complex #2 PJT	4 sets/ 320 tons
2007	ROC Furnace Q	1 sets/ 20 tons
2006	ATC FRC Project	4 sets/ 340 tons
2005	ROC M4 PJT	20 sets/ 450 tons
2004	ATC Bottlenecking Stage 2	11 sets/ 920 tons

6-5

Execution
Capacity



Electrical & Instrument Discipline



6-5. Execution Capacity of **Electrical & Instrument**



Electrical Work

- Motor Solo Run Test
- Grounding / Cathodic Work & Testing
- Cable Tray & Conduit Work
- Electrical Equipment Installation
- SWGR / MCC Trouble Shooting



E&I Work Capability

- Instruments Calibration & Loop Testing
- Electrical Installation; i.e. HV & LV SWGR, MCC, TR, cabling work, etc., Motor Solo Run Testing



Manpower Mob. Capability

- 700 Manpower (Currently 350 MP)



6-5. Team Experience for **Electrical & Instrument**



Year	Project Name	Volume
2013	PTT OCS4 Project	Cable : 164,000 m
2012	BST NB Latex Project	Cable : 190,000 m
2010	PTT Tank Terminal Project	Cable : 197,000 m
2009	PTTAR Clean Fuel Project	Cable : 227,523 m
2009	SCG THPP #3 Project	Cable : 368,380 m
2008	MOC ARU Project	Cable : 219,410 m
2008	MOC Furnace Cracker Unit	Cable : 18,410 m
2007	PTTAR Complex #2 Project	Cable : 202,758 m
2007	ROC Furnace Q Project	Cable : 48,451 m
2006	ATC FRC Project	Cable : 12,941 m
2005	MOC M4 Project	Cable : 6,478 m
2004	ATC Debottlenecking Stage 2 Project	Cable : 46,785 m

6-6

Execution
Capacity



Painting & Scaffolding Discipline



6-6. Execution Capacity of **Painting & Scaffolding**



Metal Grid Blasting Work

- 600 m²/ day

Pipe Blasting Machine (1"~ 32")

- 1,000 m²/ day

Painting Manpower Mob. Capability

- Total 150 painters

Scaffolding Manpower Mob. Capability

- Total 150 Workers



6-7

Execution
Capacity



EPC Project Experience



6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client /Location	Description	Period	Remark
ROC M4 Phase II	Rayong Olefins Co., Ltd. / Map Ta Phut	• EPC Lump sum work for Turn around 2005 of Olefin Plant (45 days)	S Nov. '05 F Dec. '05	LSTK 2.7
TPI Crude Facilities System Project	Thai Petrochemical Industry Public Co., Ltd. / Rayong	• EPC Lump Sum Work for Crude Piping Modification Work	S Jul. '05 F Jun. '06	LSTK 2.6
ROC Furnace Q Project	Rayong Olefins Co., Ltd. / Map Ta Phut	• EPC Lump sum work for Ethylene Cracking Furnace (EPC Consortium with ABB (Licensor))	S Sep. '05 F Mar. '07	LSTK 11.0
Plant 2 Bottleneck Project Cracking Furnace Unit	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• EPC Lump Sum for Cracking Furnace Unit (EPC Consortium with Linde)	S Dec. '06 F Nov. '08	LSTK 7.8
RRC Condensate and Drain Tanks Design and Construction	Rayong Refinery (Public) Co., Ltd. / Map Ta Phut	• Design and Construction Lump Sum for Civil Work for 3 Condensate Tanks and 2 Drain Tanks including Bund wall and Drainage System	S Dec. '06 F Feb. '08	LSTK 8.4

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
RRC Condensate and Drain Tanks Phase 3	Rayong Refinery (Public) Co., Ltd./ Map Ta Phut	• Construction Lump Sum for Civil, Structure, Piping & Equipment, E&I Work	S Sep. '07 F Feb. '08	LSTK 4.3
PTT Chem GHU Spare Reactor	PTT Chemical (Public) Co., Ltd./ Map Ta Phut	• EPC Lump Sum for Spare 2 Reactor	S Sep. '06 F Jan. '09	LSTK 4.5
Ethylene Off Spec. Tank	PTT Chemical (Public) Co., Ltd./ Map Ta Phut	• EPC Lump Sum for Ethylene Off Spec. Tank System	S Sep. '07 F Aug. '08	LSTK 4.2
THPP #3 Project	Thai Polypropylene Co., Ltd. / Map Ta Phut	• Construction Lump Sum (Consortium with SKEC) (Largest PP plant in the World)	S Oct. '07 F Oct. '09	LSTK 28.3
MOC Aromatic Recovery Unit	MOC / Map Ta Phut	• Construction Lump Sum (Consortium with HEC)	S Oct. '07 F Oct. '08	LSTK 19.5

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
PTT Sriracha Terminal Expansion Project (IFRT Tank)	PTT Public Co., Ltd. / Sriracha Chonburi	• EPC Lump Sum for FRT Tank (Capacity: 70,000 m ³ X 1 set)	S Oct. '08 F Sep. '09	LSTK 11.2
PSA Unit Project	PTT AR (Public) Co., Ltd. & SKEC / Map Ta Phut	• Construction Lump Sum for Civil, Structure, Mechanical, Piping and E&I Work	S Dec. '08 F Sep. '09	LSTK 3.1
PTT Chem EPS Power Plant Project	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	• 114 MW Cogeneration Power Plant Construction for Civil/Building, Mechanical, Piping and Paint/Insulation Work	S Jan. '09 F Sep. '10	LSTK 14.4
Thai Growth Project Field Erected Tank	DOW Chemical Co., Ltd. & AIE / Rayong	• EPC Lump Sum for Field Erected Tanks for TPO, PUI and SE Plant (9 sets)	S Mar. '09 F Mar. '10	LSTK 3.6
PTT Tank Terminal Project	PTT Tank Terminal Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Consortium with SKEC) for Tankage and Jetty Facilities	S Mar. '10 F Mar. '11	LSTK 67.1
BST NB Latex Project	Bangkok Synthetics Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Single contract PJT for EPC.)	S Dec. '10 F Jun. '12	LSTK 53.0

6-7 . Team Experience for EPC Project



LSTK : Lump Sum Turn Key / Figure : Project Amount in million USD

Project	Client / Location	Description	Period	Remark
Onshore Compressor Station 4 Project	PTT Public Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Consortium with SKEC)	S Mar '11 F Feb. '13	LSTK 67.0
DOW Propylene Glycol (PG) Project	DOW Chemical Co., Ltd. / Map Ta Phut	• EPC Lump Sum (Single contract PJT for EPC.)	S Jun. '11 F Jun. '12	LSTK 0.92
Environmental Improvement Project(TGTU)	Bangchak Petroleum Public Company Limited / Bangkok	• EPC Lump Sum (Single contract PJT for EPC.)	S May '10 F Mar. '11	LSTK 29.0
Saiyok Compressor Station unit 4	PTT Public Co., Ltd. /Kanchanaburee	• EPC Lump Sum	S June'12 F June'14	LSTK 28.0

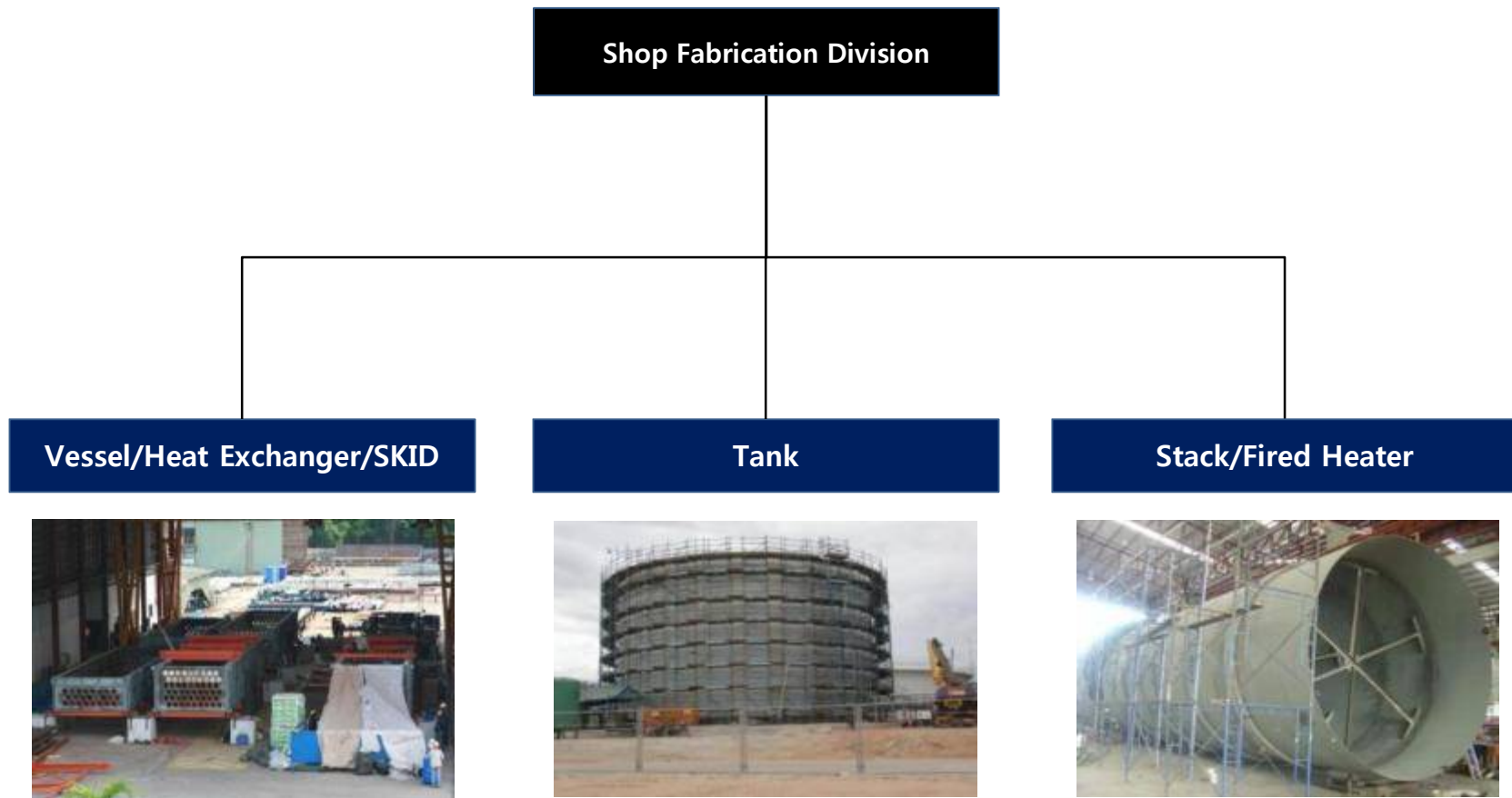
7

Shop



Shop Fab. Division

The Organization of Shop Fab. Division



1. Fabrication Items

Pressure Vessel, Heat Exchanger, Column & Tower

2. Capability

- 1) Thickness : Max. 75 m/m
- 2) Handling Weight : Max. 120 Ton/unit
- 3) Handling Length : Max. 50 m
- 4) Max Capability : 200 Tons / Month (Pressure Vessel)

3. Material

- 1) Carbon Steel : A36/A283,5/A516/A537
- 2) Stainless Steel : A312 TP304(L)/316(L)/310(H)/321(H)/347(H)
- 3) Alloy Steel : A387/Kubota Steel
- 4) CLAD Material : SS+CS



7-1

Execution
Capacity

Pressure Vessel / Heat Exchanger / Column / Tower



- CNC Cutting



- Auto Welding



- Head Forming



- Heat Exchanger



7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
PTT OCS#4 Project (PTT Public Co.,Ltd.)	Flar Blow Down Drum	Horizontal	ID3500 x 12000TL x 21t	SA516-60N+S5	2012	Stamp "U"
	Slop Tank	Horizontal	ID3000 x 12000TL x 13t	SA516-60N+S5	2012	Stamp "U"
	Instrument Air Receiver	Vertical	ID3600 x 10000TL x 20t	SA240-304	2012	Stamp "U"
	Utility Air Accumulator	Vertical	ID1500 x 4000TL x 11t	SA516-70	2012	Stamp "U"
	Desel Oil Tank	Horizontal	ID1800 x 5000TL x 9t	A283-C	2012	Stamp "U"
Bayer Public Co.,Ltd.	Vacuum package	BEM	ID400 x 2500L x 12t	A240-316Ti/A312-TP316Ti	2012	Stamp "U"
	Spare Charge heater	BEU	ID1020 x 3782TL x 14t	A516-60N/A179	2012	Stamp "U"
	Vent Cooler	BEU	ID389 x 3800TL x 11t	A516-60N/A179	2012	Stamp "U"
BCP TGTU Project (The Bangchak Petroleum Public Co.,Ltd.)	Quench Column	Column	ID1600 x 14700TL x 9t	A240-316L	2012	
	Absorber	Column	ID1200 x 15800TL x 13t	A516-60N	2012	
	Regenerator	Column	ID1100 x 19350TL x 11t	A516-60N/A240-316L	2012	
	Hydrogeneration Reactor	Horizontal	ID2100 x 3800TL x 13t	A516-60N	2012	
	Tail Gas Preheater	BEU	ID1020 x 3782TL x 14t	A516-60N/A179	2012	
	Tail Gas Heater A	BEU	ID1016 x 5998TL x 13t	A516-60N/A179	2012	
	Tail Gas Heater B	BEU	ID1016 x 5998TL x 13t	A516-60N/A179	2012	
	Recycle Gas Preheater	BEU	ID489 x 3800TL x 11t	A516-60N/A179	2012	
	Reboiler	BKU	ID1550 x 5657TL x 10t	A240-316L/A312-TP316L	2012	
PTTGC 2 and 3 Project	AC Filter A	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	AC Filter B	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	AC Filter C	Vertical	ID2100 x 4700TL x 15t	A516-60	2012	
	Absorber Column V63	Vertical	ID970 x 3315TL x 15t	A516-60	2012	
	Absorber Column V4	Vertical	ID970 x 3315TL x 15t	A516-60	2012	

7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
BST NB Latex Project Pressure Vessel New Fabrication (Bangkok Synthetics Co.,Ltd)	PMHP Tank	Vertical	OD762 x 1219H	A240-316L	2011	
	Reducer Tank	Vertical	OD1270 x 1829H	A240-316	2011	
	Initial Charge Tank A	Vertical	OD2133.6 x 5181.6H	A240-316	2011	
	Initial Charge Tank B	Vertical	OD2438 x 3352.8H	A240-316L	2011	
	Aqueous Feed Tank Train A	Vertical	OD1524 x 3080H	A240-316	2011	
	Catalyst Feed Tank Train A	Vertical	OD1524 x 3080H	A240-316	2011	
	Aqueous Feed Tank Train B	Vertical	OD1524 x 3080H	A240-316	2011	
	Catalyst Feed Tank Train B	Vertical	OD1524 x 3080H	A240-316	2011	
	Aqueous Feed Tank Train C	Vertical	OD1524 x 1981.2H	A240-316	2011	
	Catalyst Feed Tank Train C	Vertical	OD1676.4 x 2606.8	A240-316	2011	
	FeSO4 Premix Tank A	Vertical	ID500 x 750H	A240-316L	2011	
	Persulfate Catalyst Premix Tank	Vertical	OD1372.6 x 406.4H	A240-316	2011	
	White Water Tank AB	Vertical	OD3657.6 x 6096H	A240-304	2011	
	Intermediate Latex Tank A	Vertical	OD3660 x 11000H	A240-304	2011	
Intermediate Latex Tank B	Vertical	OD3650 x 9470H	A240-304	2011		
BST NB Latex Project Heat Exchanger (Bangkok Synthetics Co.,Ltd)	Stripper Jacket Heater Train C	BEM	OD8" Pipe x 2297.2L	A106-B , A240-304L	2011	
	AN Scrubber Water Cooler	H-Double Pipe	400W x 5305.7L x 1500H	A106-B	2011	
	First BD Condenser	BEM	ID450 x 5039L	A516-70	2011	
	Deaerator Water Cooler	BEM	ID700 x 7920L	A516-70	2011	
	Hot Water Heater	BEM	OD8" Pipe x 2527.2L	A106-B	2011	
	First BD Condenser	BEM	OD8" Pipe x 3033L	A106-B	2011	
	AN Recycle Cooler	H-Double Pipe	400W x 5305.7L x 1500H	A312-304 , A106-B	2011	
	Vent Condenser	BEM	OD16" Pipe x 3264.8L	A106-B	2011	
	Vent Condenser	BEU	OD10" Pipe x 2209L	A106-B	2011	
	Reactor Jacket Heater Train CDEF	BEM	OD12" Pipe x 2228.8L	A106-B , A240-304	2011	
	Initial Charge Heater AB	BEM	OD10" Pipe x 2448L	A106-B , A240-316L	2011	
	Dodecyl Benzene Sulfonic (DDBSA) Tank Heater	H-Double Pipe	400W x 4011.3L x 1900H	A312-316 , A106-B	2011	
	MAA Cooler	BEM	OD16" Pipe x 2002.8L	A106-B , A312-316L	2011	
	Stripper Overhead Condenser Train AB	BEM	Shell ID1044 x 5156.2H	S/T=CS , Tube=304SS	2011	

7-1. Team Experience for Vessel / Heat Exchanger Fabrication



Project	Equipment Name	Type	Dimension	Material	Period	Remark
BST NB Latex Project Pressure Vessel Fabrication (Bangkok Synthetics Co.,Ltd)	Screener Collection Tank Train A/B/C	Vertical	ID762 x 915TL	A516-70 + Teflon Coating	2011	
	Condensate Flush Drum	Vertical	ID1000 x 3200TL	A516-70	2011	
	Process Air Receiver Drum	Vertical	ID2800 x 6500TL	A516-70	2011	
	Instrument Air Receiver Drum	Vertical	ID3200 x 10000TL	A516-70	2011	
	Flare K.O. and Blow Down Drum	Horizontal	ID3400 x 7000TL	A516-70	2011	
	Recovered an Storage Tank	Horizontal	ID2200 x 3850TL	A516-70	2011	
	Na2SO3 Hopper	Vertical	920W x 920L x 810H	A240-316L	2011	
	Bruggoglite Bag Dump Hood	Vertical	900W x 910L x 810H	A240-316L	2011	
	O2 Scavenger Bag Dump Hood	Vertical	500W x 500L x 510H	A240-316	2011	
	Compound Tank B/C	Vertical	ID3048 x 5182TL	A240-304L	2011	
	Emergency Killing Agent Tank	Vertical	ID700 x 1050TL	A240-304	2011	
	Hot Water Drum	Vertical	ID750 x 2100TL	A516-70	2011	
	Compound Tank Train A	Vertical	OD3657.6 x 6832.6H	CS + Glass lined	2011	
	Blowdown Tank Train A/B	Vertical	ID3810 x 6769.1H	CS + Glass lined	2011	
	Blowdown Tank Train C	Vertical	ID3810 x 6807.2H	CS + Glass lined	2011	
	Stripper Train A	Vertical	ID3658/3810 x 4744H	CS + Glass lined	2011	
	Stripper Train B	Vertical	ID3658/3810 x 4744H	CS + Glass lined	2011	
	Stripper Train C	Vertical	ID3658/3810 x 4673.6H	CS + Glass lined	2011	
	Reactor Train A	Vertical	ID2590.8 x 4673.6H	CS + Glass lined	2011	
	Reactor Train B	Vertical	ID2590.8 x 4673.6H	CS + Glass lined	2011	
	Reactor Train C	Vertical	ID2600/2700 x 5247.9H	CS + Glass lined	2011	
	Scrubber Solution Prep Tank	Vertical	OD1371.6 x 1660H	A240-316L	2011	
	AN Storage Tank	Saddle	ID3048 x 9067.8L	A240-304L	2011	
	TDDM Day Tank	Vertical	OD3048 x 4877H	A240-304L	2011	
	PTZ Solution Charge Tank	Vertical	ID600 x 610H	A240-304	2011	
	DDBSA Storage Tank	Vertical	OD2895.6 x 6705.6H	A240-316	2011	
	Caustic Tank	Vertical	OD2743.2 x 7426H	A240-304	2011	
NH40H Tank	Vertical	OD3200 x 6000H	A240-316	2011		
Changuard Tank	Vertical	ID1270 x 2600H	A240-316L	2011		

7-2

Execution
Capacity

Tank Fabrication / Erection



- FRT Tank



PTT Tank Sriracha

- DRT / CRT Tank



PTT Tank Terminal

Dow Chemical

PTT Chemical

7-2. Execution Capacity of Tank Fabrication / Erection



- DRT / CRT Tank



PTT Tank Terminal



PTT LNG Tank Terminal

7-2. Execution Capacity of Tank Fabrication / Erection



- Spherical Tank



Press 1500 tons



Plate cutting



PTT Tank Terminal PP Tank



PTT LPG Tank/ Kaoboya



PTT Tank Terminal PP Tank

7-2. CAZ Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
PTT Tank Terminal	PTT Tank Terminal/ Map ta phut	4,000 Ton Propylene Spherical Tank (U2 Stamp) and Facilities (EPC Project)	S Dec. 16 F Aug. 18	
PTT LNG Terminal	PTT LNG	Warm and Cold Water Tanks (CRT)	S Jul. 17 F Feb 18	

7-2. Team Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
SAKC Expansion PJT	SAK CHASIDHI / Map ta phut	Expansion Storage Tank 11 ea	S Oct. 13 F Mar. 15	
KaoBoYa LNG Tank PJT	PTT/Sriracha Chonburi	EPC Lump Sum for LPG Tank (3,000 Tons, 2 Sets)	S Oct. 13 F Feb. 15	
JAC Storage Tank PJT	JAC/Singapore	JAC C1 Storage Tank 22 Sets	S Jul. 12 F Mar. 13	
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map ta phut	EPC Lump Sump Contract for Tank Terminal 1 Spherical Tank	S Jul. 10 F May. 11	
OCS#4 Project	PTT Public Co.,Ltd. / Map Ta Phut	EPC Lump Sump Contract for Field Erection Tanks for OCS#4 (2 Tanks)	S April 12 F Sep. 12	
Thai Growth Project Field Fab. Tank Project	DOW Chemical Co., Ltd. / AIE/Rayong	EPC Lump Sump Contract for Field Erection Tanks for PG (6 Tanks)	S June. 11 F Apr. 12	
PTTAR Biodiesel Tank	PTT AR (Public) Co., Ltd. / Map Ta Phut	Bio-Diesel Tank Fabrication/Erection (2 Tank)	S Feb. 11 F Nov. 11	
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map ta phut	EPC Lump Sum for Propylene Sphere Tank (3000 Tons)	S Oct. 10 F July. 11	

7-2. Team Experience for Tank Fabrication / Erection



Project	Owner/Client/Location	Description	Period	Remark
PTT Tank Terminal PJT	PTT Tank Terminal Co., Ltd. / Map ta phut	EPC Lump Sump Contract for Tank Terminal including 8 CRT tanks	S May. 10 F Apr. 11	
MOC Aromatic Recovery Unit	MOC/ Map Ta Phut	Construction Lump Sum & Solvent Tank Fab. / Erection	S Oct. 07 F Dec. 09	
PTT CHEM EPS POWER PLANT	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	114 MW Cogeneration Power Plant Construction & Tank Fabrication/Erection (5 Tank)	S Jan. 09 F Sep. 10	
PTT Sriracha Terminal Expansion Project (FRT Tank)	PTT Public Co., Ltd./ Sriracha Chonburi	EPC Lump Sum for FRT Tank (Capa. 70,000 m ³ x 1 set)	S Oct. 08 F Sep. 09	

7-3

Execution
Capacity

Fired Heater, Stack(steel/flare), SKID Unit



7-3

Execution
Capacity

Fired Heater, Stack(steel/flare), SKID Unit



7-3

Execution
Capacity

Heater Modularization Work



7-3. Team Experience for Fired Heater, Stack(steel/flare), SKID Unit



Project	Owner/Client/Location	Description	Period	Remark
PTT GSP5 WHRU Project	PTTGC / E-Tech / Thailand	WHRU - Coil material A335P11/P22(Pin tube Type)	S Dec. '13 F Jun. '14	F / 3.3 M
Aramco Project	Aramco/KTI/Saudi	Steel work - Radiant / Convection / Stack	S Dec. '13 F May. '14	F / 1.8 M
CILACAP Project	GSEC/Linde/Indonesia	Fired Heatet (2 Sets, 430 tons) - Coil material A335P11/P22 TP304H/321H	S Aug. '13 F Feb. '14	F / 1.8 M
UHV Project	IRPC/ITT/Thailand	Fired Heatet (4 Sets, 400 tons) - Coil material A335P11/P22	S Oct. '13 F Mar. '14	F / 1.4 M
SAMUR Project	PETRONAS/ITT/Malaysia	Reformer (1 Set, 1,150 tons) - Coil material A335P11/P22/ TP304H/321H	S Jul. '12 F Mar. '13	F / 40.0 M
West Qurma II Project	SECL/ITT/IRAQ	Hot oil heater (8 Sets, 880 tons with Modularization) - Coil material A106B	S Jul. '12 F Dec. '12	F / 2.2 M
Algiers Refinery Project	AADR/ITT/Algeria	Atmospheric & Fired Heater (6 Sets, 1,780 Tons) - Coil material A335P5/P9/P11/P22	S Mar. '12 F Nov. '12	F / 30.0 M
South Par Project	NIOC/ITT/Iran	Fired heater (6 Sets, 256 tons) - Coil material A106B	S Feb. '12 F Aug. '12	F / 0.8 M

7-3. Team Experience for Fired Heater, Stack(steel/flare), SKID Unit



Project	Owner/Client/Location	Description	Period	Remark
RMP Project	Petron Bataan / ITT / Philippines	Fired heater (2 Sets, 515 tons with Modularization) - Coil material A335P9/P11/TP347H	S Mar. '12 F Oct. '12	F / 1.2 M
JAC Project	SKEC / ITT /Singapore	Reformer & Charge heater & Re-boiler (13 Sets, 7,800 Tons with Modularization) - Coil material A335P9/P11/P22/TP304H/TP321H/TP347H	S Jan. '12 F Oct '12	FME / 26.0 M
Tianjin China Project	TBCO / ITT / China	Reactor charge heater (1 Set, 880 Tons) - Coil material A335P11/TP321/TP347	S Oct. '11 F Jun. '12	F / 2.0 M
PTTAR Clean Fuel Project	PTTAR Co., Ltd. / CDI / Map ta phut	Fuel Steel Stack - 1sets - Duel Wall Type 5Stage (80 m)	S Mar. 10 F Sep. 10	
SIPCO 160MW Co-Generation Project	Siam Power/Generation (Public) Co., Ltd./ Ban Kay	Main Stack Fabrication	S Mar.09 F Aug.09	
Technip MOC Cracking Furnace	Technip & MOC / Map Ta Phut	Erection of Ethylene Cracking Furnace and Furnace Piping Work (8 Sets, 9,700 Tons) - KUBOTA STEEL/P11/P12, 68,000DB	S Sep. '07 F Aug. '09	
Plant 2 Bottleneck Project Cracking Furnace Unit	PTT Chemical (Public) Co., Ltd. / Map Ta Phut	Cracking Furnace (1 Set, 480 Tons) - Coil material P11, P12 Alloy	S Dec. '06 F Nov. '08	
ROC Furnace Q Project	Rayong Olefins Co., Ltd. / Map Ta Phut	Cracking Furnace (1 Set, 600 Tons) - Coil material P11, P12 Alloy LPG	S Sep. '05 F Mar. '07	

7-3. Team Experience for **Coil & Piping Fabrication**



Year	Project Name	Volume
2012	SAMUR Project	P11/P22/TP304H/321H / 18,800 DB
2012	West Qurma II Project	A106B / 6,000 DB
2012	Algiers Refinery Project	P5/P9/P11/P22 / 11,500 DB
2012	South Par Project	A106B / 2,800 DB
2012	RMP Project	P9/P11/TP347H / 4,600 DB
2011	JAC Project	P9/P11/P22/TP304H/TP321H/TP347H / 51,000 DB
2011	Tianjin China Project	P11/TP321/TP347 / 9,600 DB
2009	MOC Cracking Furnace	KUBOTA STEEL/P11/P12 / 68,000 DB
2008	PTT Chem. LPG Cracking Furnace	P11/P12 / 18,000 DB
2007	PTT Tank Terminal Project (ROC Ethylene Cracking Furnace)	P11/P12 / 24,000 DB

8

Facilities



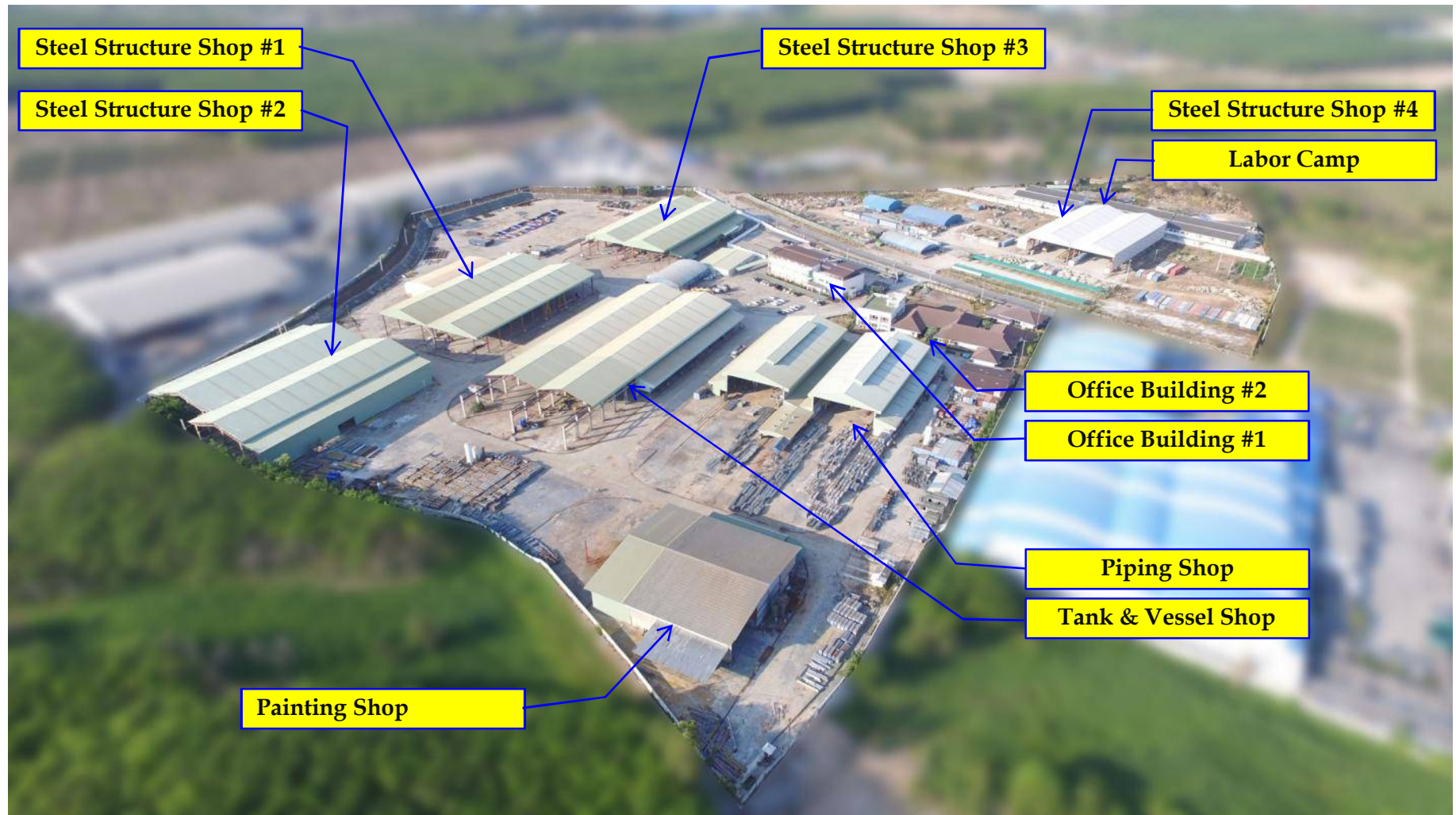
Major Facilities

8. Office & Fabrication Shop

- Office & Shop Panorama



Total Area : 258,000 m2, Shop Area : 30,000 m2, Laydown :86,000 m2



8. Office & Fabrication Shop

- Office & Shop Panorama



#2 Laydown :50,000 m2

CAZ Shop

Laydown Area



Laydown Area



8. Office & Fabrication Shop

- Major Shop Equip. & Tools



Equipment Category	Q'ty	Unit	Equipment Category	Q'ty	Unit
PLASMA CUTTING MACHINE	1	Set	Plate Bending Roller (~ 25 T)	1	Set
CNC Shape Drill Cutting Machine (Auto)	2	Set	Plate Bending Roller (~ 50 T)	1	Set
CNC Plate Cutting Machine	3	Set	CNC Pipe Cutting Machine	1	Set
CNC Band Saw (High Speed)	1	Set	Hydraulic Press Machine (1,500 Tons)	1	Set
CNC Plate Drill Machine (~100mm)	4	Ea	Overhead Crane (30 Tons)	2	Ea
Band Saw (Amada) ~600 mm	1	Ea	Overhead Crane (10 Tons)	14	Ea
Band Saw (Shoper) ~ 300 mm	1	Ea	Overhead Crane (5 Tons)	10	Ea
CNC Beveling & Scallop M/C	1	Set	Gantry Crane (10 Tons)	6	Ea
Pipe & Shape Steel Hydraulic Rolling M/C	1	Set	Gantry Crane (5 Tons)	2	Ea
PWHT MACHINE: MH-RG60 1 SET	8	Set	Blasting Tool Set	4	Set
Auto Welding Manipulator	2	Set	Painting Spay Tool Set	6	Set
Welding M/C (CO2 FCAW)	106	Ea			Ea
Welding M/C (SMAW / Mig / Tig)	125	Ea			

8. Office & Fabrication Shop

- Major Shop Equipment



Pipe & Shape Hydraulic Rolling M/C



CNC Plate Cutting M/C



Hydraulic Press M/C (1,500 Tons)



CNC Scallop M/C



CNC Shape Drill Cutting M/C



Plate Bending Roller



CO2 FCAW Welding M/C



CNC Band Saw



Auto WELDING MANIPULATOR



8. Office & Fabrication Shop

- Major Construction Equip.



Equipment Category	Q'ty	Unit
HIAP TRUCK (5 TON)	4	Ea
Crane (25 Ton)	1	Ea
Folk Lift (5 Ton)	4	Ea
JCB	2	Ea
Back Hoe	1	Ea
Air Compressor	2	Ea
5 ton Truck (Songtaew)	1	Ea
Compact Roller	1	Ea
Water Truck	1	Ea
Oil Tank Truck	1	Ea
Office Container	25	Ea
Mobile Toilet	4	Ea
Generator (9 – 50 KVA)	6	Ea
Labor Camp	240	Room

8. Office & Fabrication Shop

- Major Construction Equip.



HIAP Truck



Crane (25 Ton)



Back Hoe



Compaction Roller 10 ton



Folk Lift (5 Ton)



Air Compressor



Labor Camp



JCB



5 Tons Truck (Songtaew)



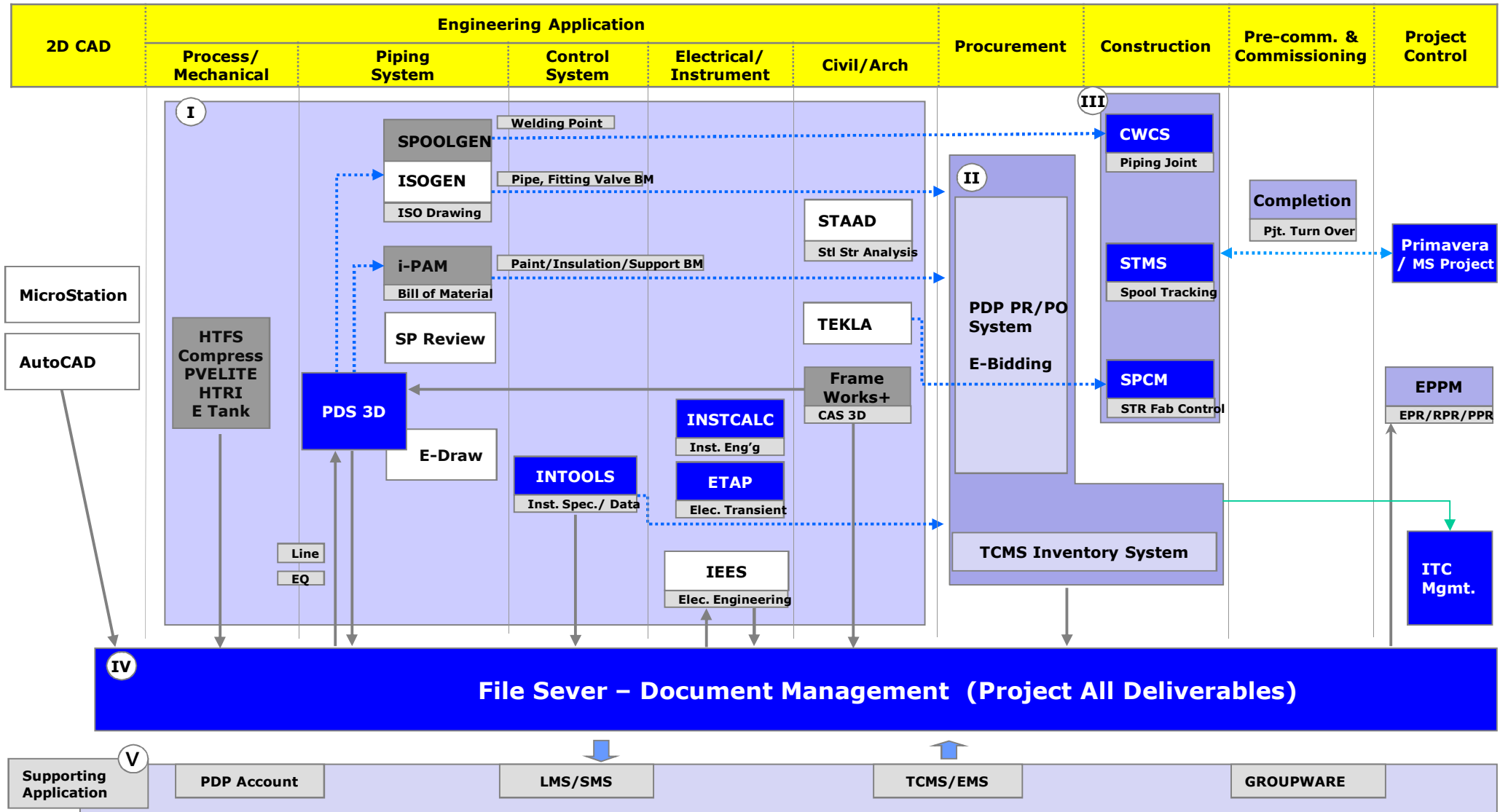
9

IT



CAZ IT System

Overall Application Architecture

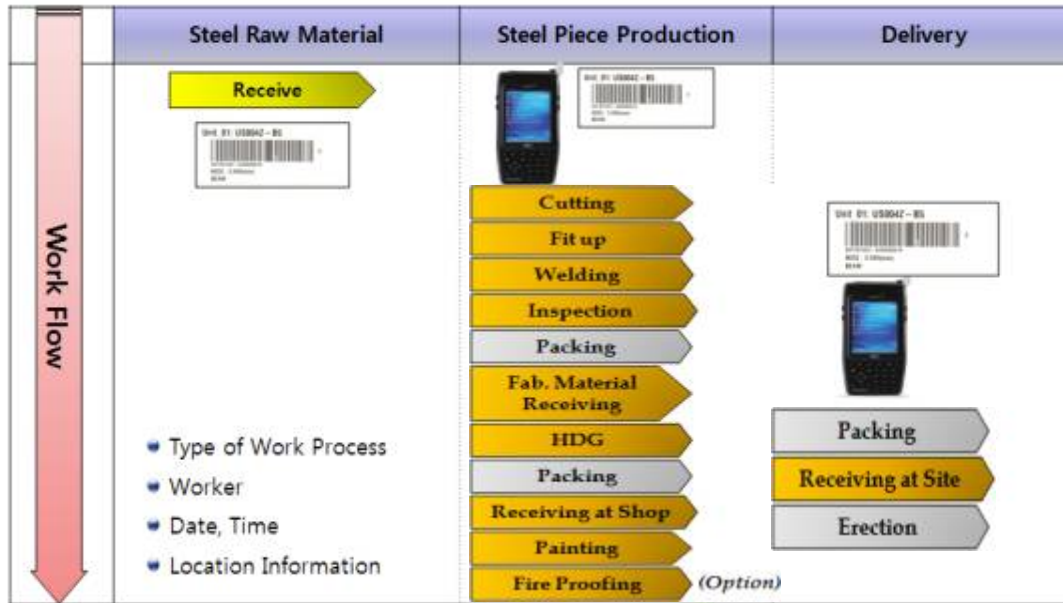




IT System for Construction



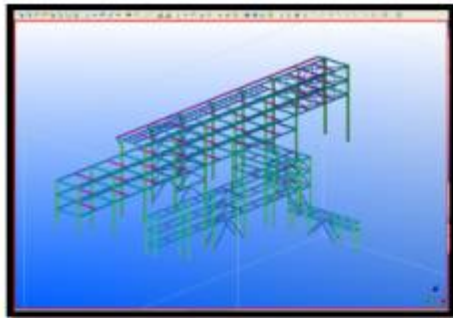
- System is based on Bar-Code & GPS System



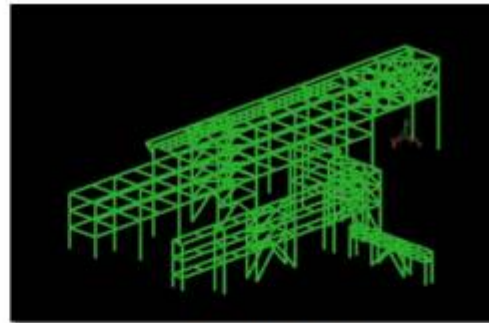
- Data Management for Raw Materials
- Production Management for Steel Members
- Delivery Management for Steel Members
- Searching & Reporting for Status of Production
- Operating of Each Project



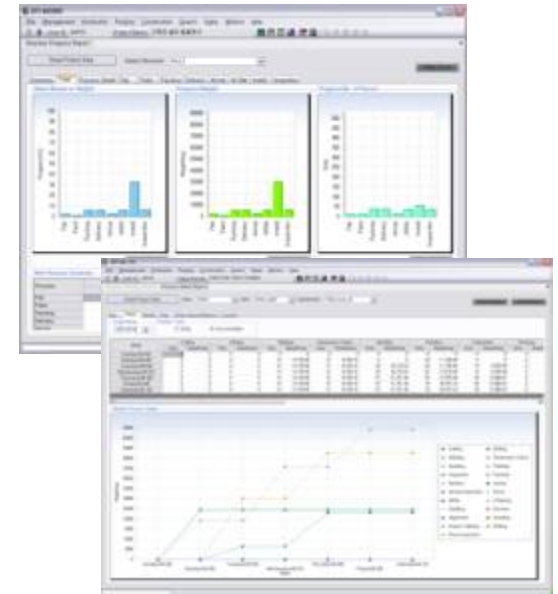
<Overall Work Procedure for SPCM>



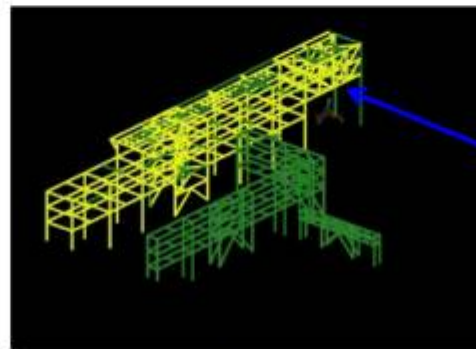
< TEKLA3D >



< SPCM 3D >



< Automation Report >



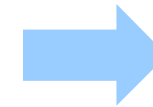
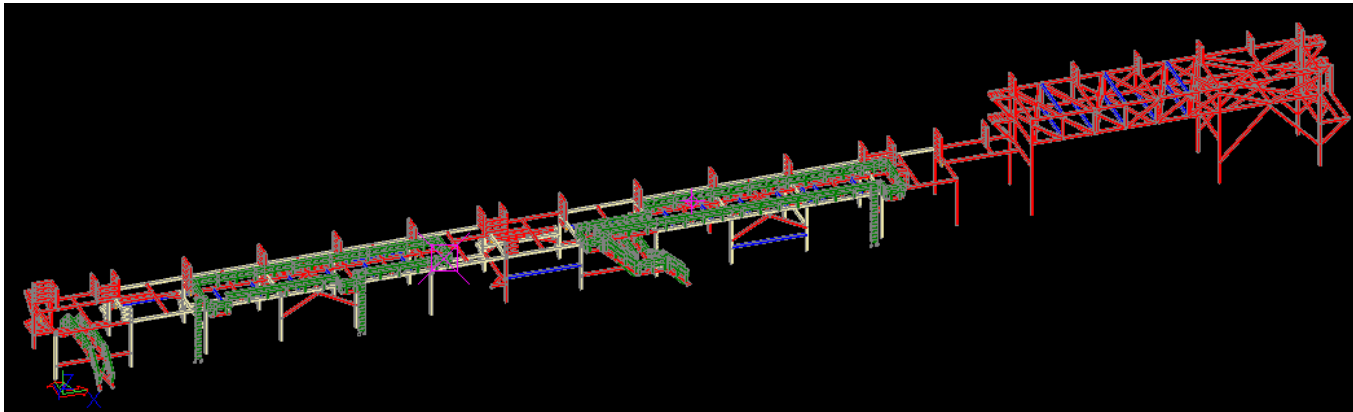
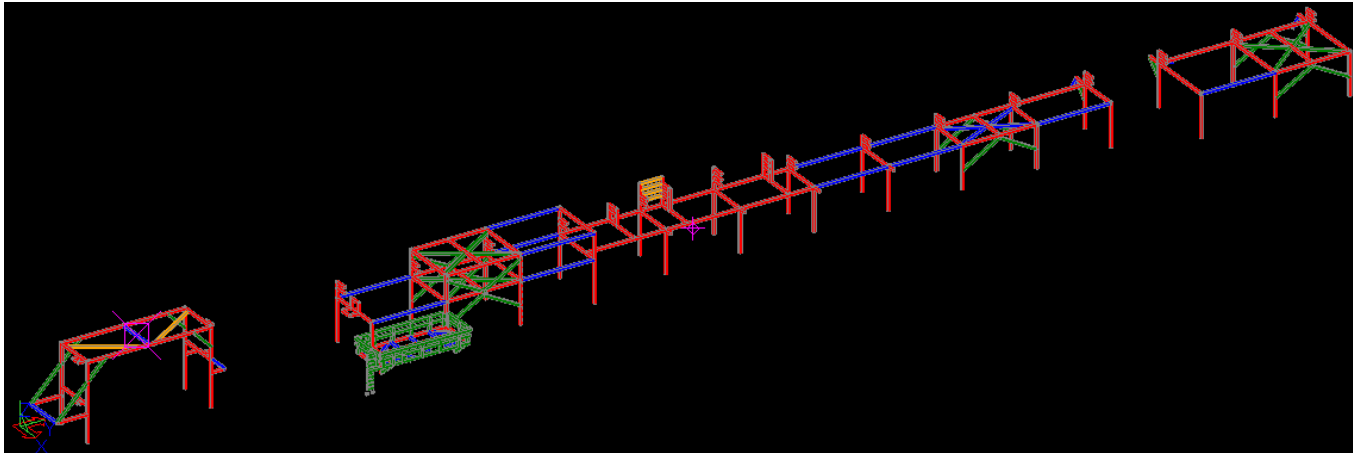
< 4D Search >



Yellow : Completed
(Checking Function by process & color)

- Cutting
- Fit up
- Welding
- Inspection
- Packing
- Fab. Material Receiving
- HDC
- Packing
- Receiving at Shop
- Painting
- Fire Proofing
- Packing
- Receiving at Site
- Erection

<Overall Work Procedure for SPCM>



9-1. IT System for Construction

- System is based on Web Version

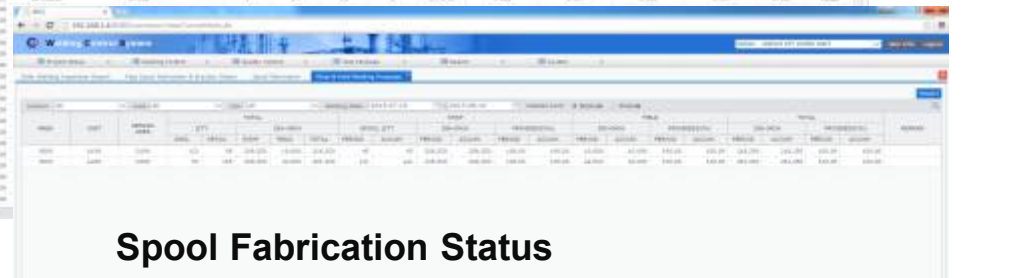
Log-In Screen



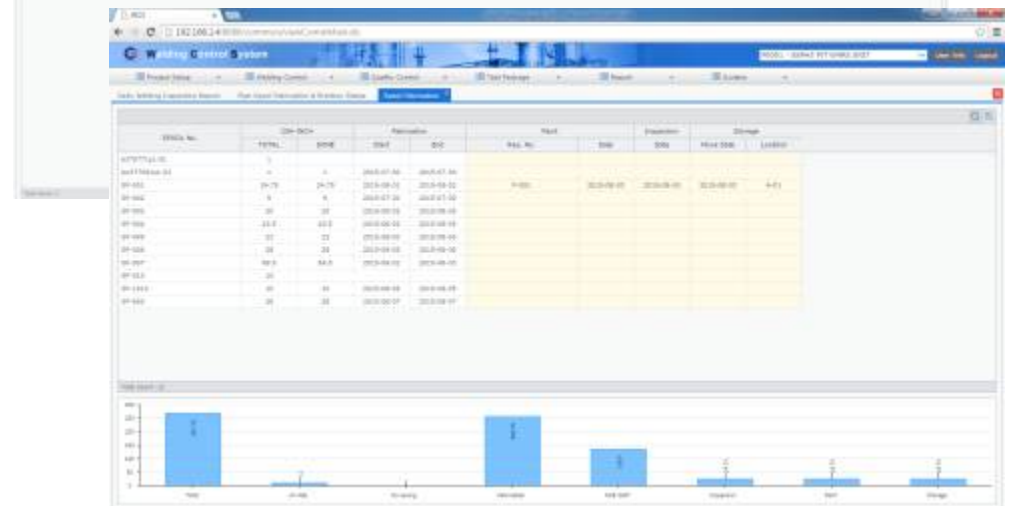
Daily Welding Inspection Report



Shop & Field Welding Progress Report



Spool Fabrication Status

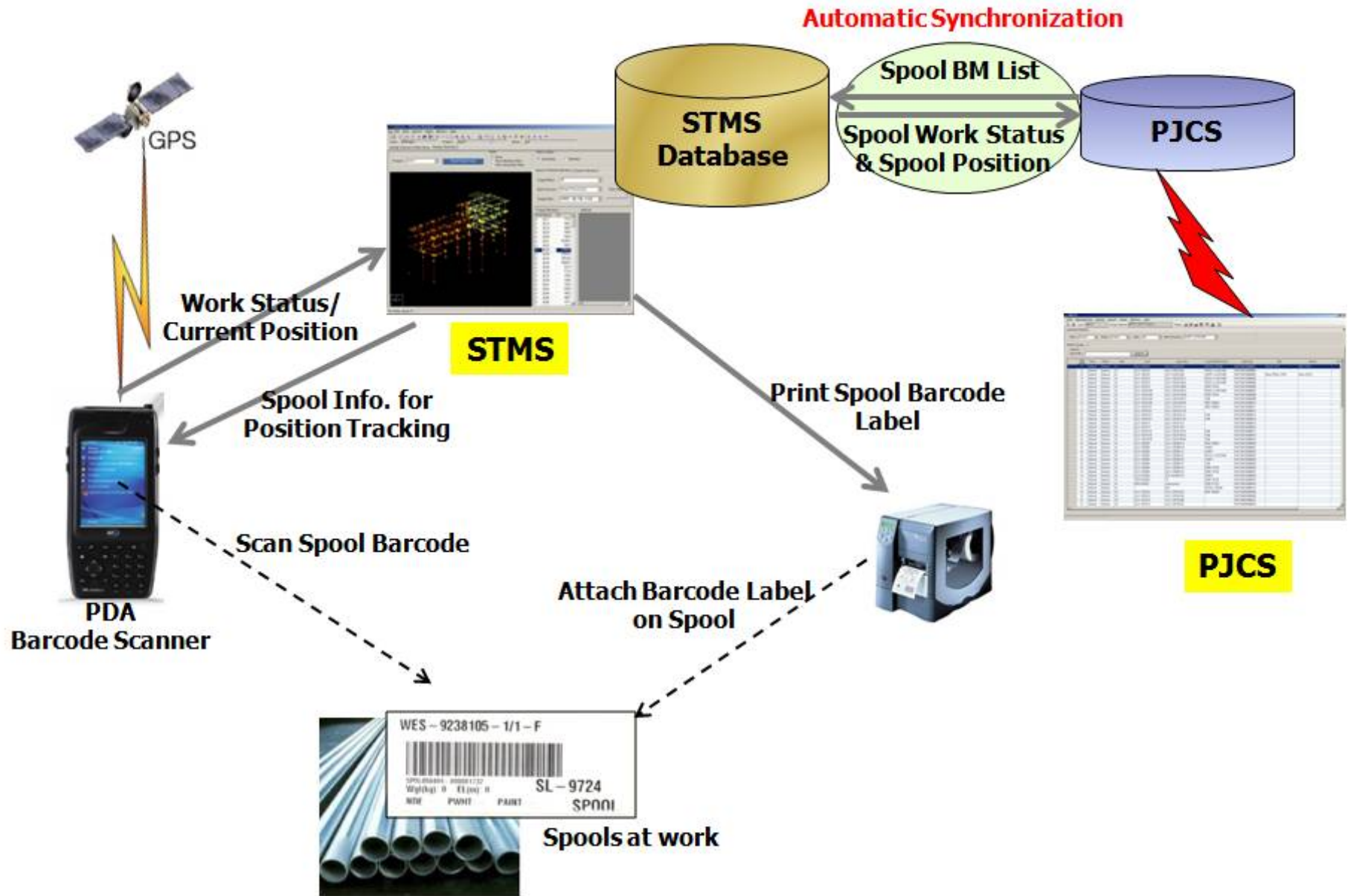


Report List

- Progress Report : 5 kinds
- Inspection Report : 3 kinds
- Spool Report : 3 kinds
- NDE Report : 9 kinds
- Welder Report : 5 kinds

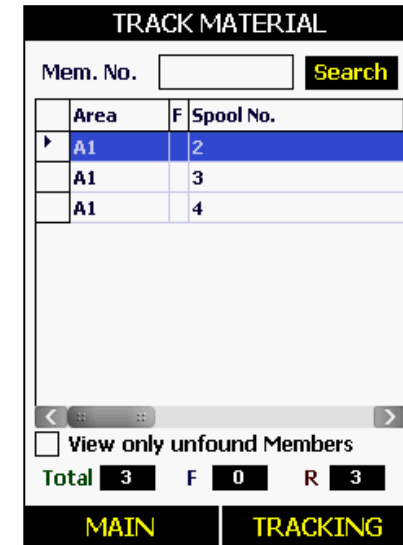
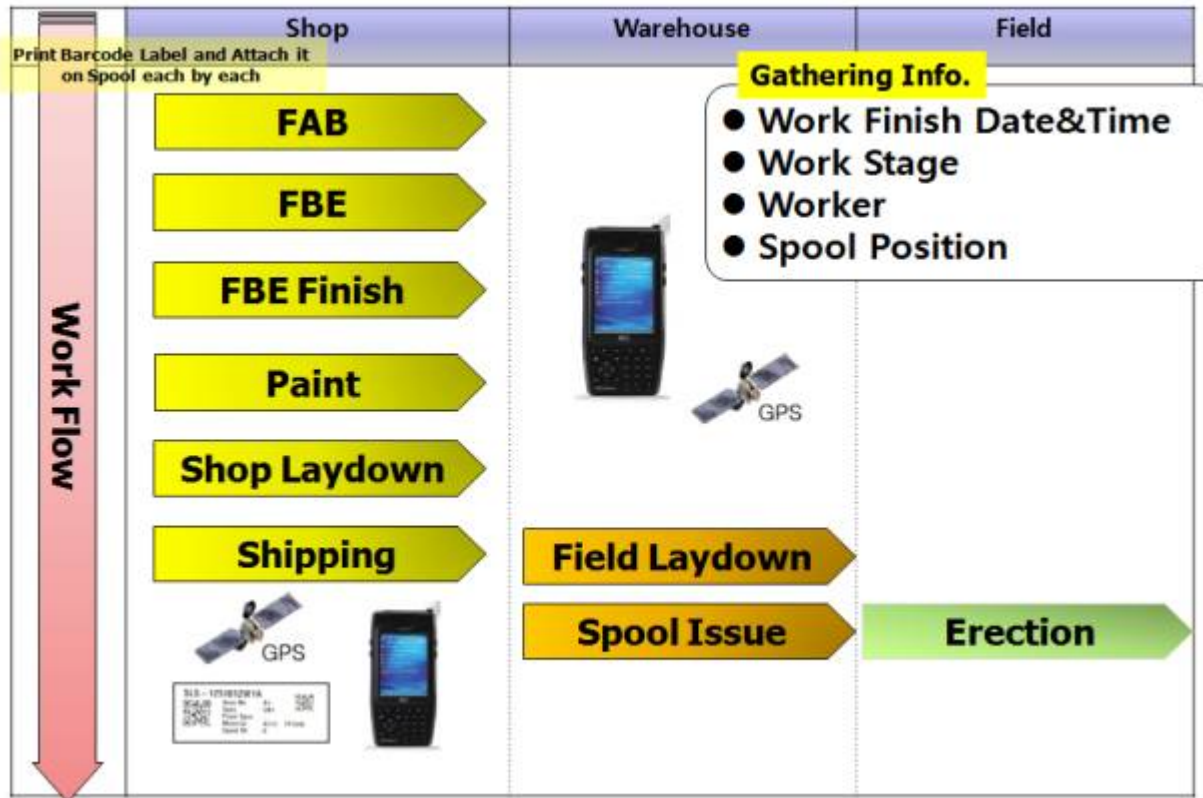
9-1. IT System for Construction

- Spool Tracking Mgmt. System(STMS)

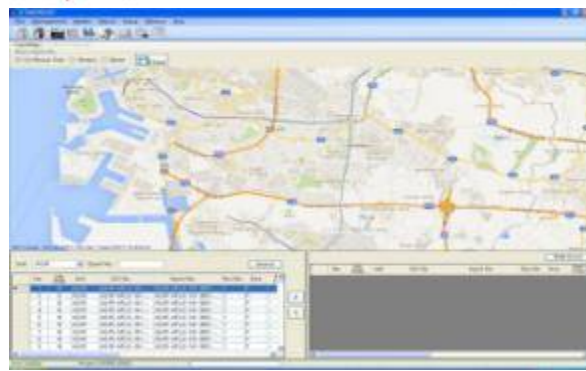


9-1. IT System for Construction

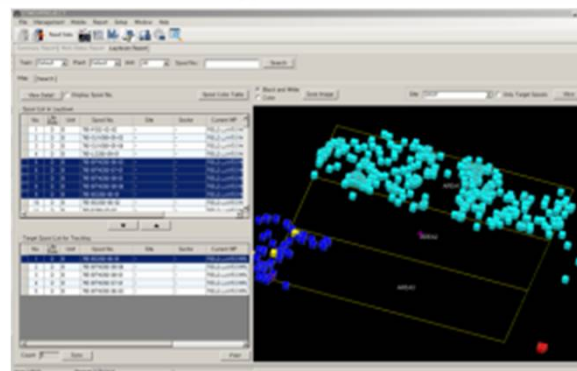
- Spool Tracking Mgmt. System(STMS)



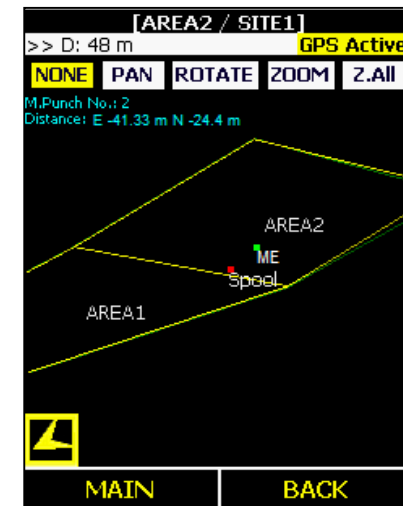
Tracking by PDA with GPS



STMS Google Map



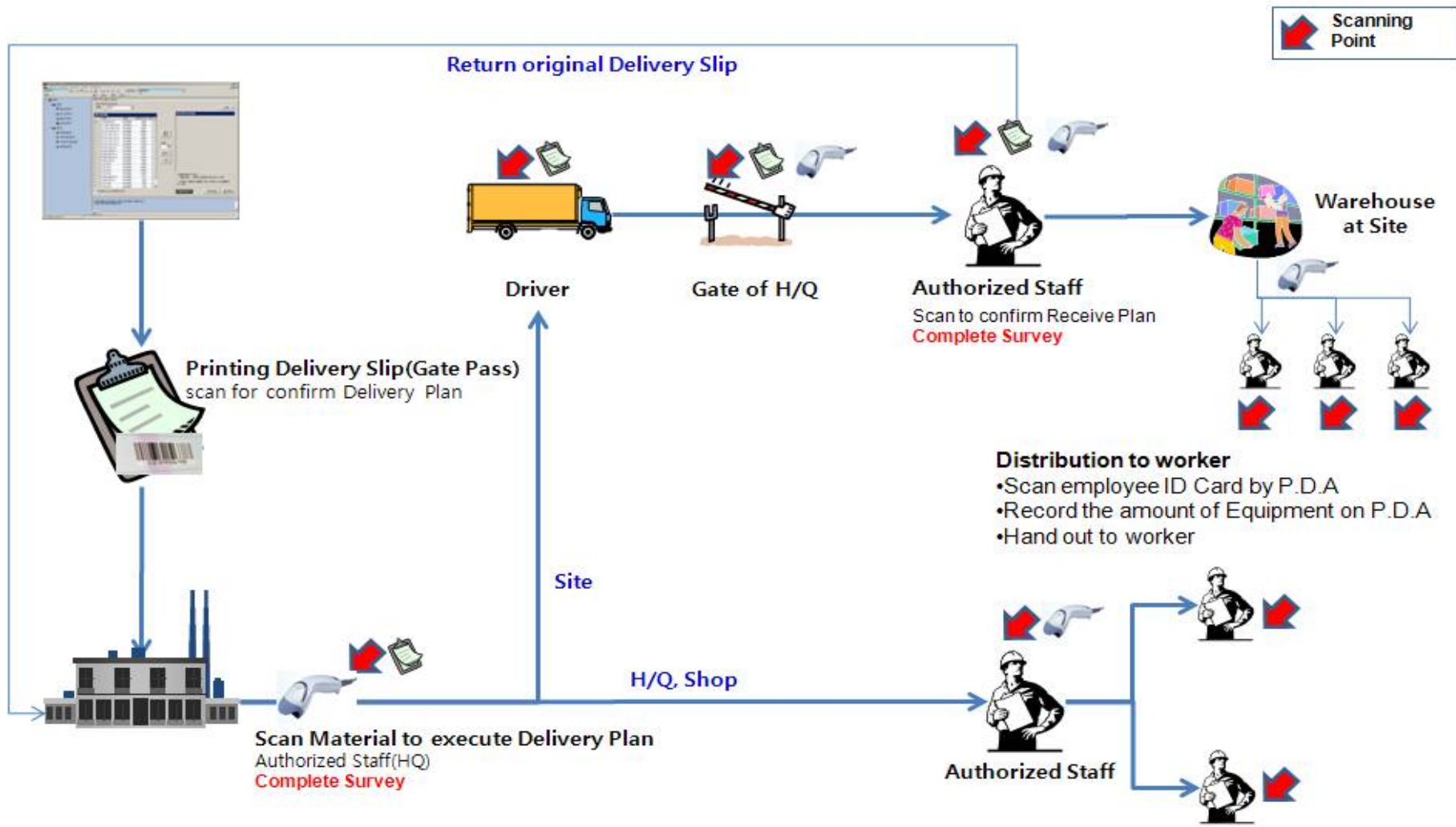
STMS 3D Map



9-1. IT System for Construction



TCMS: Tools, Asset & Consumable Management System (Base on Bar-Code System)

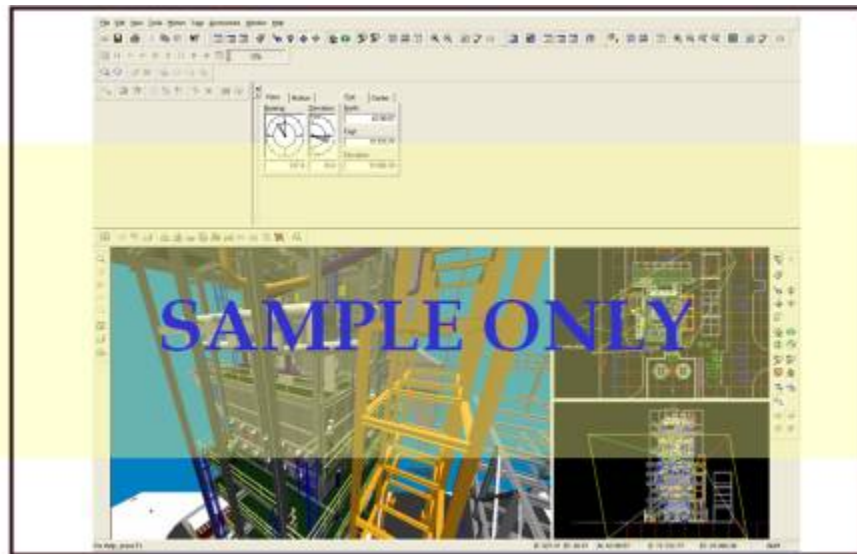




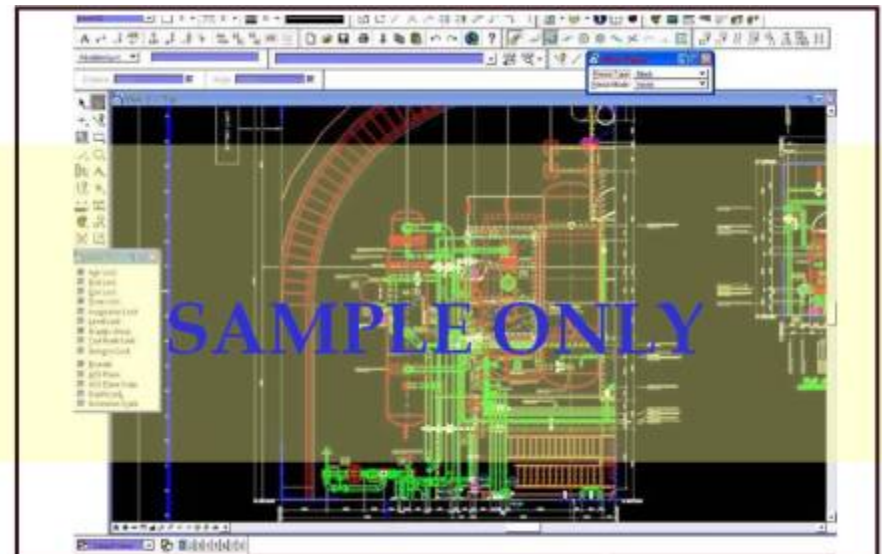
IT System for Engineering

Program	Description
PDS	PLANT DESIGN SYSTEM Intergraph Software
MicroStation	Software by Bentley working with PDS
Caesar II	Piping Structural Stress Analysis
ACAD 2D, 3D	Piping Geometric drawing, Isometric drawing
Pro DSMS	AutoCAD Developed Program for Piping Designer

PDS (Plant Design System)



MicroStation



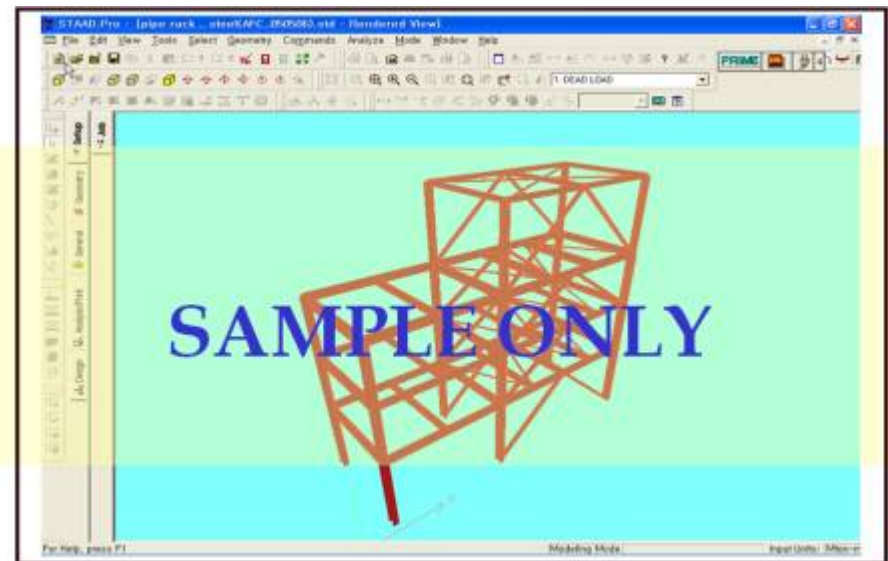


Program	Description
AFES	Automatic Foundation Engineering System
STAAD/PRO2001	Concrete & Steel Str. Cal. & Design Analysis
TEKLA, SPCM	Generate Structure Shop drawing
ACAD 2D, 3D	Generate Civil, Structure & Arch. Drawing
TAMP	CAZ AUTO MTO PROGRAM

AFES – Auto. FDN.



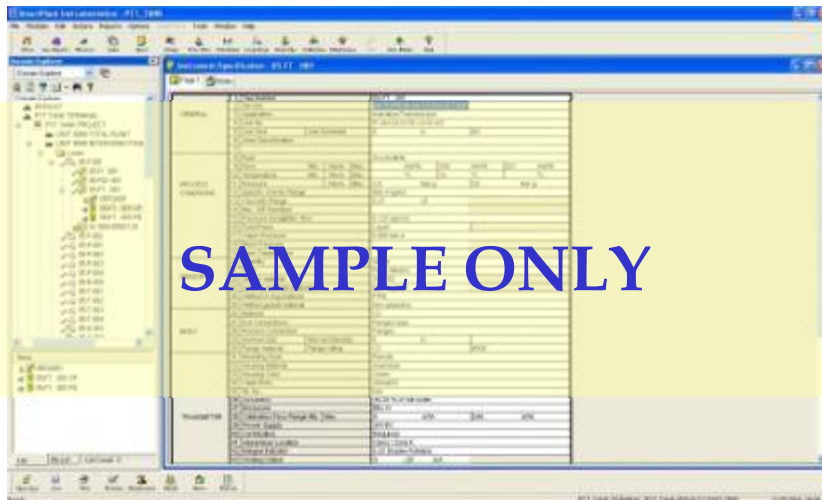
STAAD/PRO2001 – Concrete/Steel STR. Calc



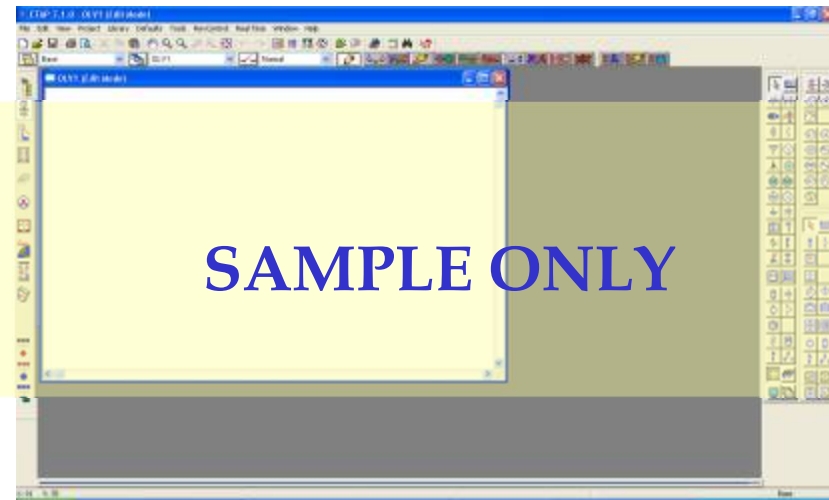
9-2. IT System for Engineering

Program	Description
SP Instrumentation/INTOOLS	Software by Intergraph for Cable routing work with PDS software
ACAD 2D, 3D	AutoCAD generic E&I layout drawing and hook-up diagram etc.
TWRE ORIFICE CALC.	Orifice Sizing Calculation
EE – POWER	CAZ Voltage Drop Calc.
ETAP	CAZ Cable Sizing Calculation

INTOOLS



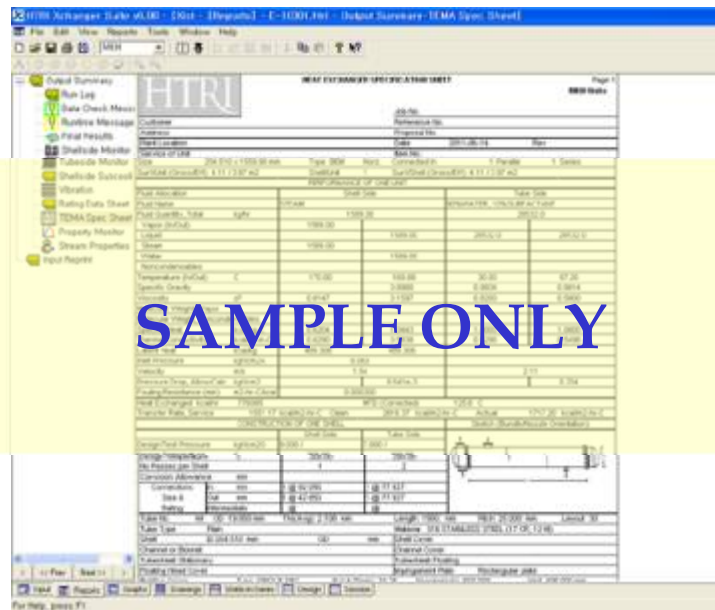
ETAP



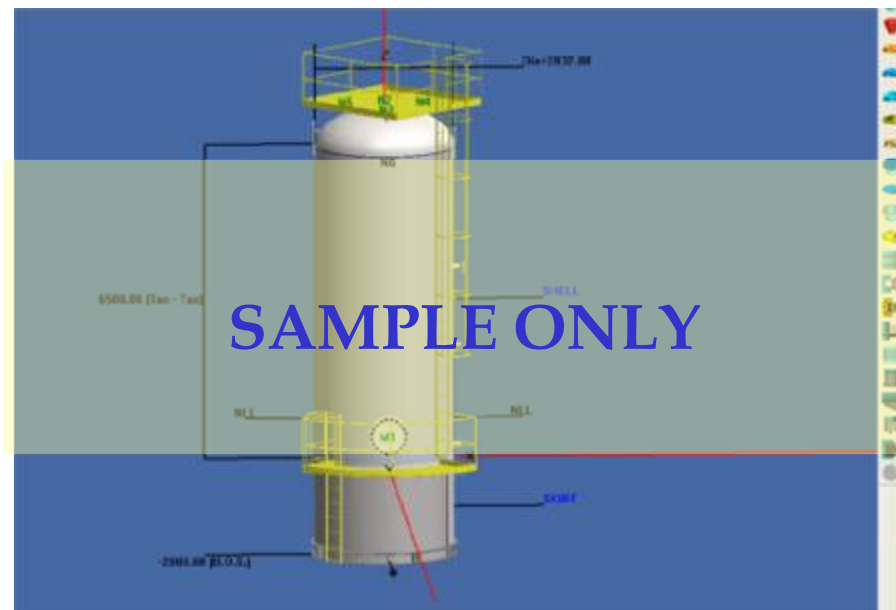


Program	Description
HTFS	Heat Exchanger Thermal rating Program
COMPRESS	Pressure Vessel & H-Ex. Calculation
PVELITE	Pressure vessel & H-Ex. Calculation
HTRI	Heat Exchanger Thermal rating Program
E TANK	Storage Tank Calculation

HTRI



COMPRESS



10

Quality



Quality Assurance

10. Quality Assurance

1) Quality Policy



- Quality Policy -

CAZ Co., Ltd. has established its quality policy in totally committed and takes pride in offering a construction work to clients in terms of cost, schedule, quality, standard and safe through our service with an excellence team work, to satisfy our customers through continual improvement approach. Our short slogan is defined as follow

To ensure this the following strategic and scheme are required to implement with effectiveness.

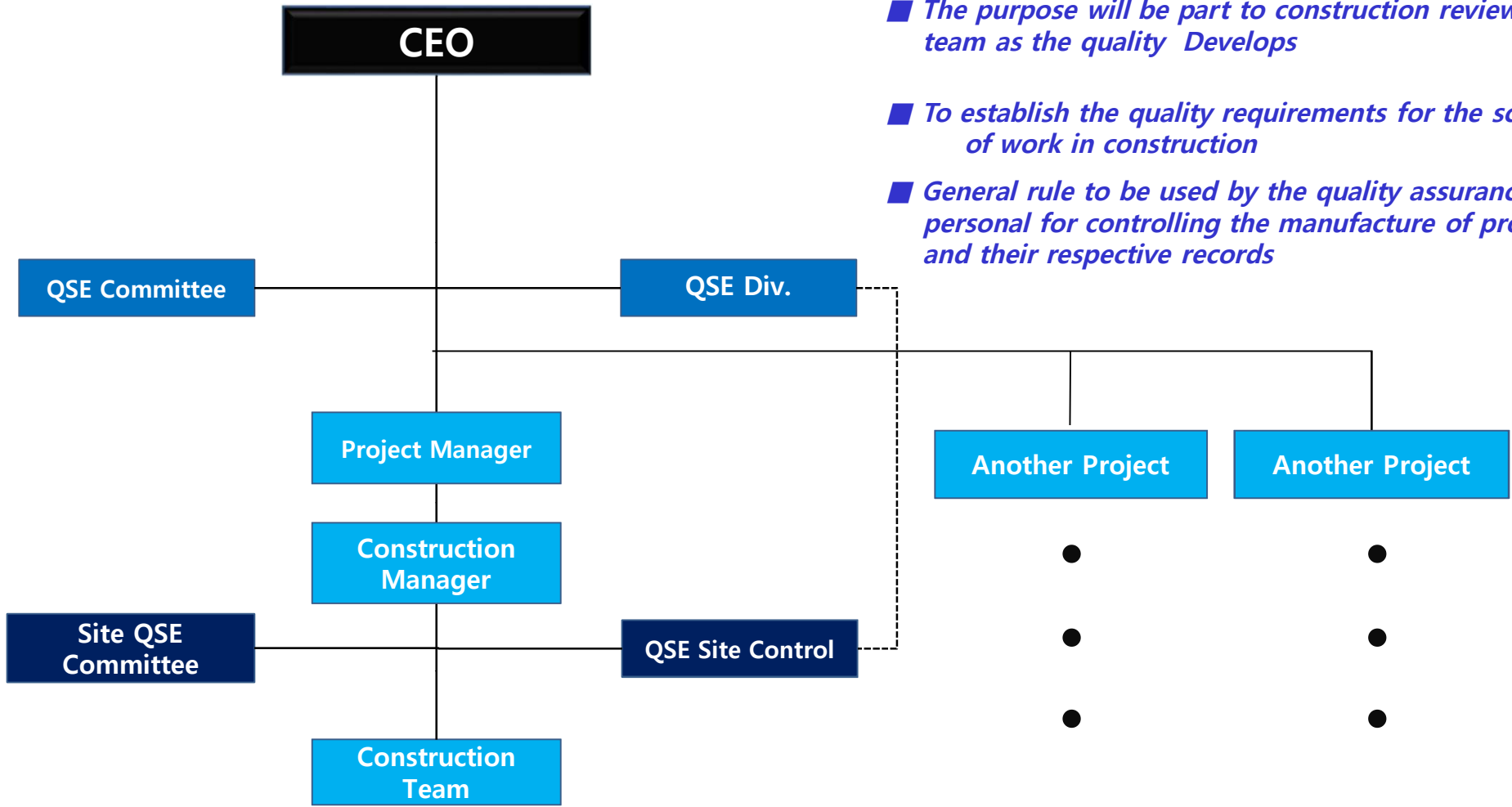
- ✓ Establish a quality management system
- ✓ Provide quality construction work with highly standard, safety and on-time deliver performance to meet our customer's standard and requirements
- ✓ A training program has been established to increase potential capability and performance of our personnel.
- ✓ Establish the company strategic annual objectives and quantifiable targets and review its continuing suitability through management review activity

All personnel are required to understand and have responsibilities to implement, maintain and improve its performance to achieve this policy continually.

10. Quality Assurance

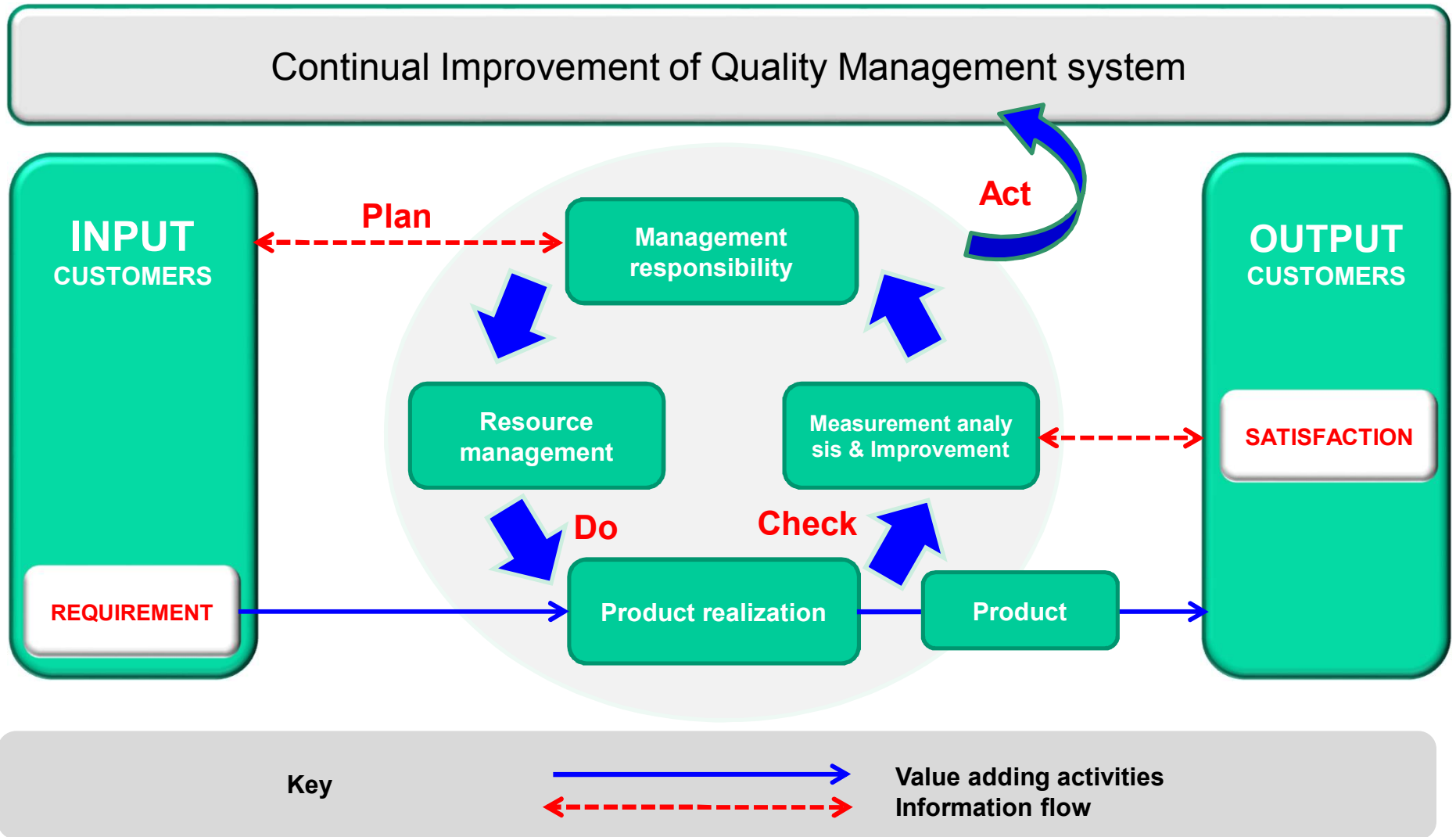
2) QSE Organization

- *The purpose will be part to construction review team as the quality Develops*
- *To establish the quality requirements for the scope of work in construction*
- *General rule to be used by the quality assurance personal for controlling the manufacture of products and their respective records*



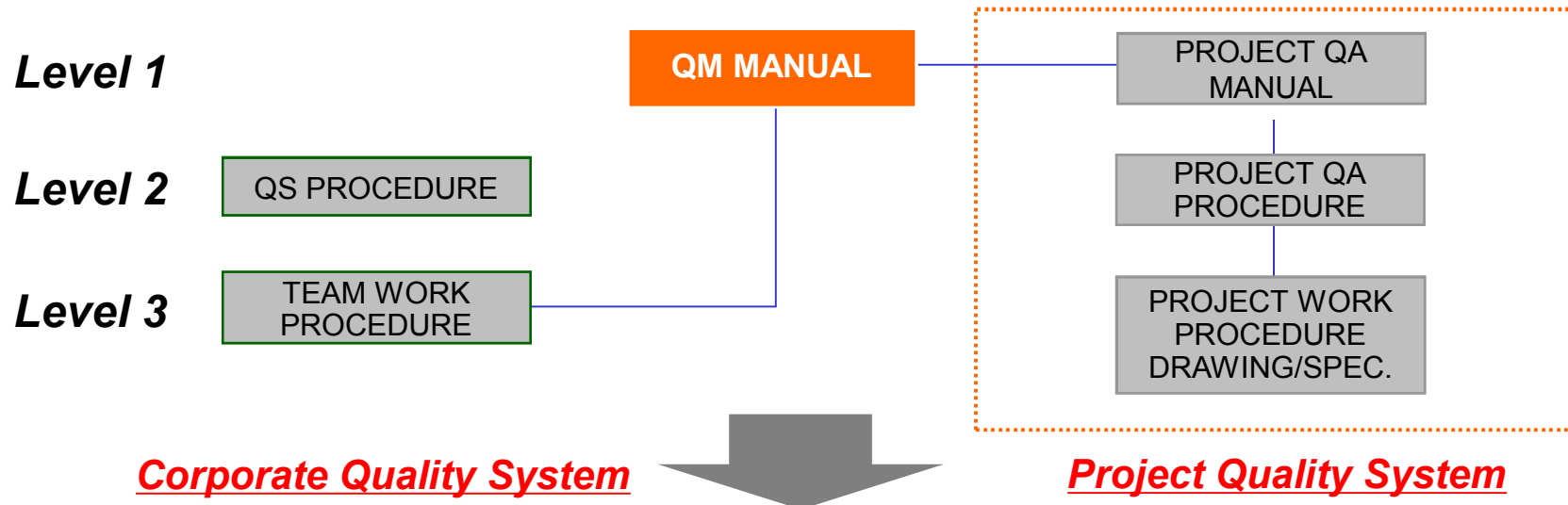
10. Quality Assurance

3) Quality Management System



10. Quality Assurance

4) Structure of Quality Document System



Quality Record

Project Files - Contract/Purchase Order - Contract Specification - Project Correspondence - Route/Process Sheet - Inspection/Test Plan & Report - As-built Drawings - Material Test Reports - Calibration Data Nonconformance Reports	Training Records Qualification Records	Internal Quality Audit Reports	Management Review Reports	Contract Review Reports	Vendor/ Subcontractor Control Data
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10. Quality Assurance

5) ISO 9001:2008 Certificate

- CAZ has developed Quality Management System to control Total Quality which is included Quality Assurance, Quality Control and Quality Audit
- Renewed Certificate of ISO 9001:2008 on 12. Jan. 2018

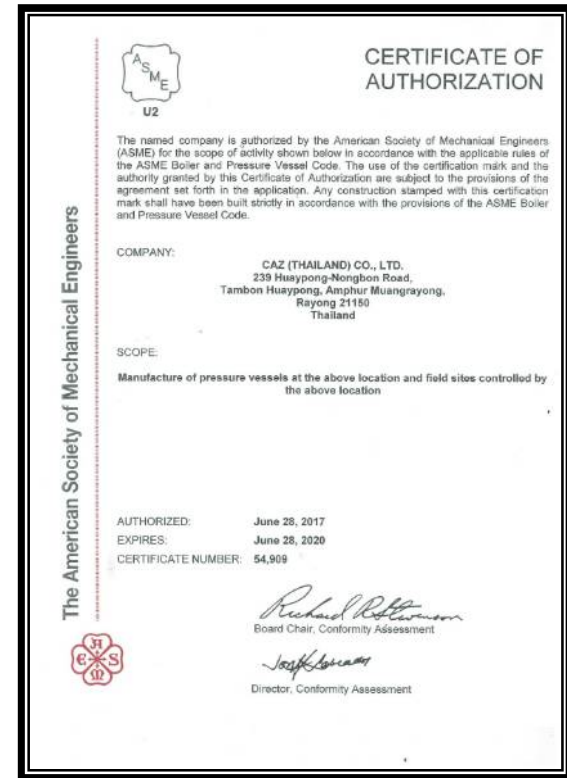
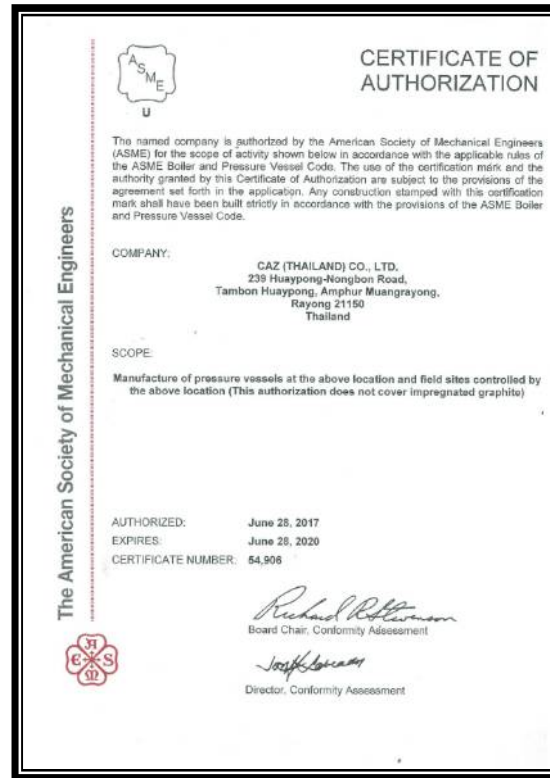
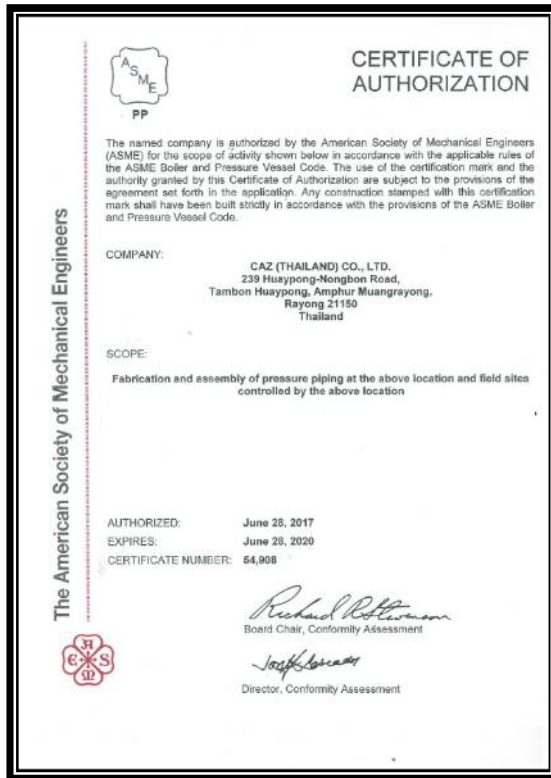


10. Quality Assurance

6) ASME Certificate



- Approved by ASME Certified Body, Certificates were issued in Jun 2017

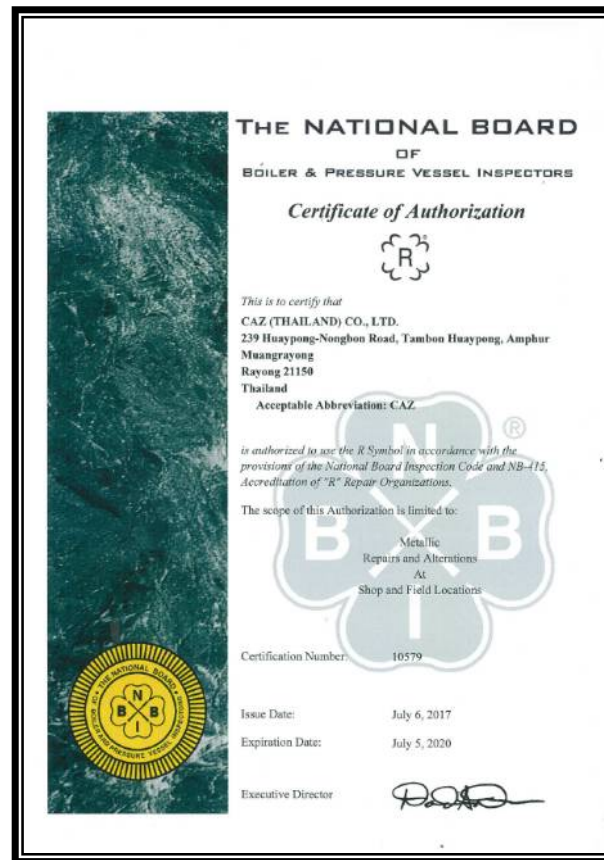
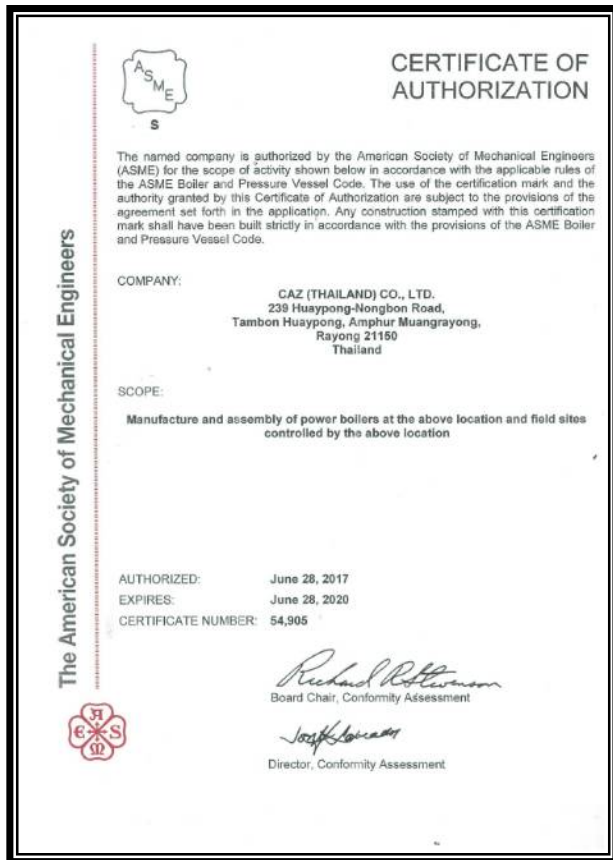


10. Quality Assurance

6) ASME Certificate



- Approved by ASME Certified Body, Certificates were issued in Jun 2017



11

Safety



Safety Management System

11. Safety Management System

1) Safety Policy



- Safety Policy -

CAZ (Thailand) Co., Ltd. is committed to providing a healthy and safe work environment for its workers and preventing occupational illness and injury. To express that commitment, we issue the following policy on occupational health and safety.

As the employer, CAZ (Thailand) Co., Ltd. is responsible for the health and safety of its workers. CAZ (Thailand) Co., Ltd. will make every effort to provide a healthy and safe work environment. We are dedicated to the objective of eliminating the possibility of injury and illness.

As CAZ (Thailand) Co., Ltd., I give you my personal promise to take all reasonable precautions to prevent harm to workers.

Supervisors will be trained and held responsible for ensuring that the workers, under their supervision, follow this policy. They are accountable for ensuring that workers use safe work practices and receive training to protect their health and safety.

Supervisors also have a general responsibility for ensuring the safety of equipment and facility. CAZ (Thailand) Co., Ltd. through all levels of managements, will cooperate with the joint occupational health and/or the representative and workers to create a healthy

and safe work environment, cooperation should also be extended to others such as contractors, owners, officers , etc.

The workers of CAZ (Thailand) Co., Ltd. will be required to support this organization health and safety initiative and to cooperate with the occupational health and safety committee or representative and with others exercising authority under the applicable laws.

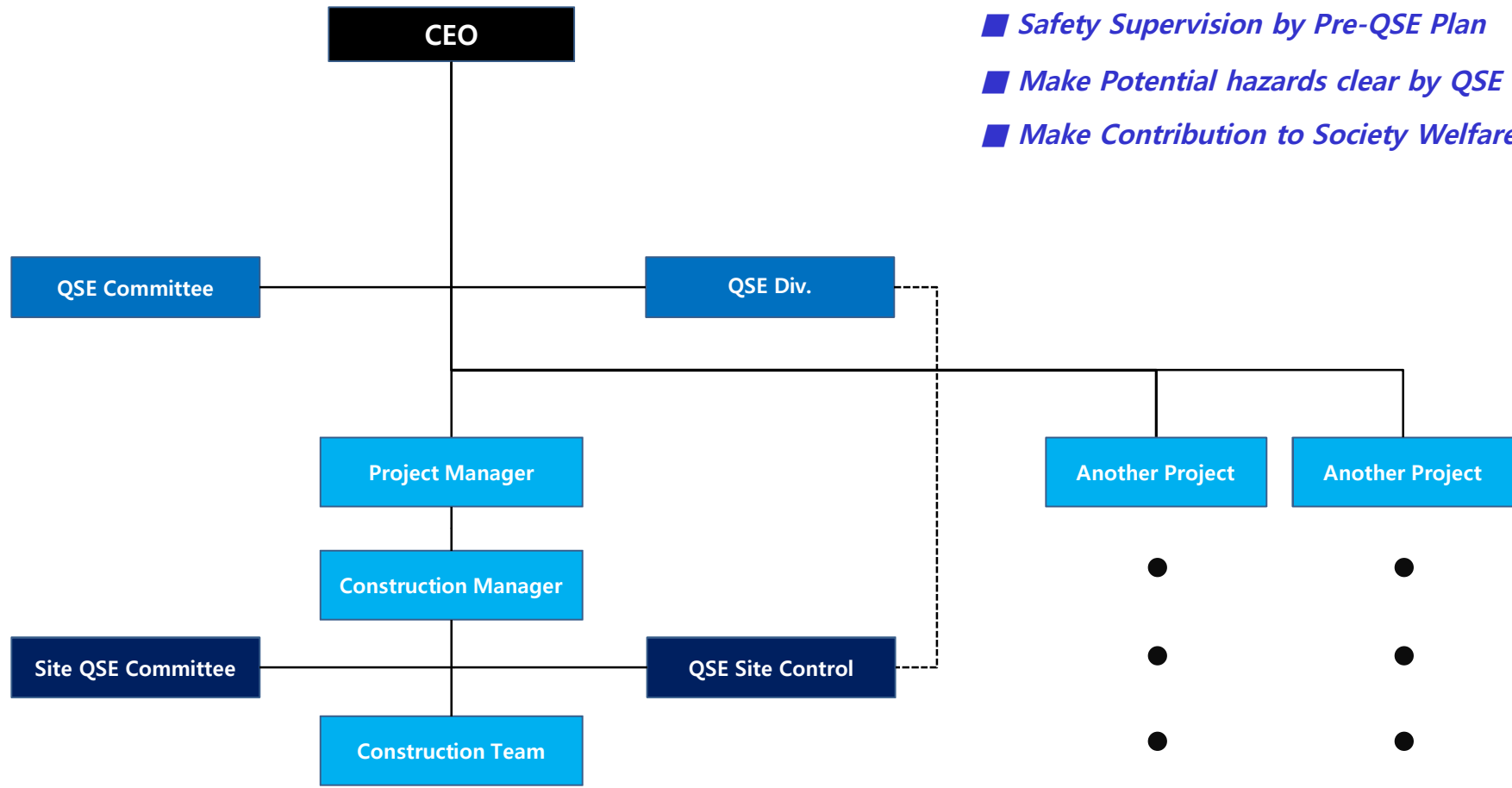
It is the duty of each worker to report to the supervisor of manager, as soon as possible, any hazardous conditions , injury, accident or illness related to the workplace. Also, workers must protect their health and safety by complying with applicable acts and regulations and to follow policies, procedures, rules and instructions as prescribed by CAZ (Thailand) Co., Ltd.

CAZ (Thailand) Co., Ltd. will, where possible, eliminate hazards and, thus, the need for personal protective equipment. If that is not possible, and where there is a requirement, workers will be required to use safety equipment, clothing, devices and materials for personal protection.

CAZ (Thailand) Co., Ltd. recognizes the workers duty to identify hazards and supports and encourages workers to play an active role in identifying hazards and to offer suggestions or ideas to improve the health and safety program.

11. Safety Management System

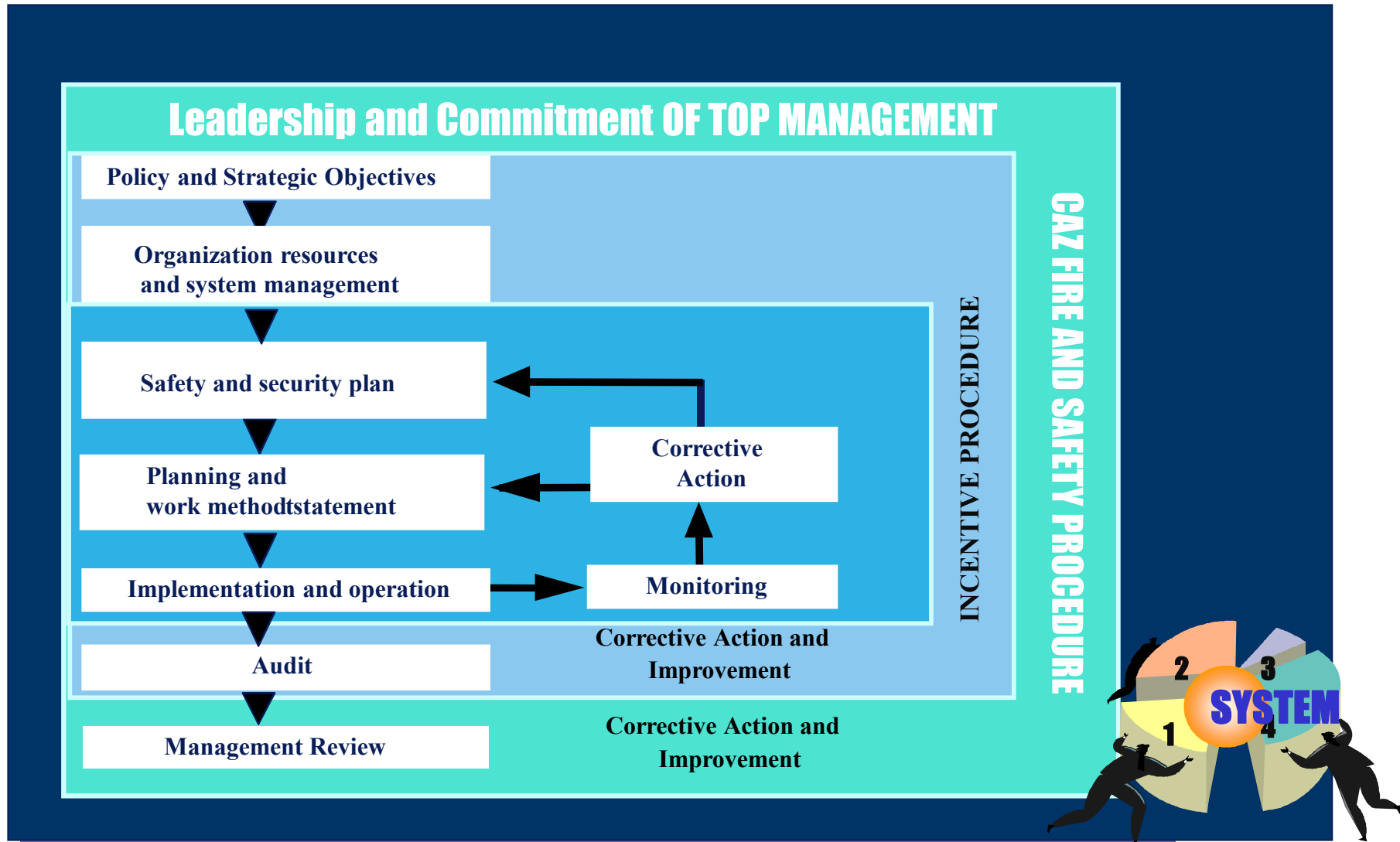
2) Safety Organization



- *Safety Supervision by Pre-QSE Plan*
- *Make Potential hazards clear by QSE Operation*
- *Make Contribution to Society Welfare*

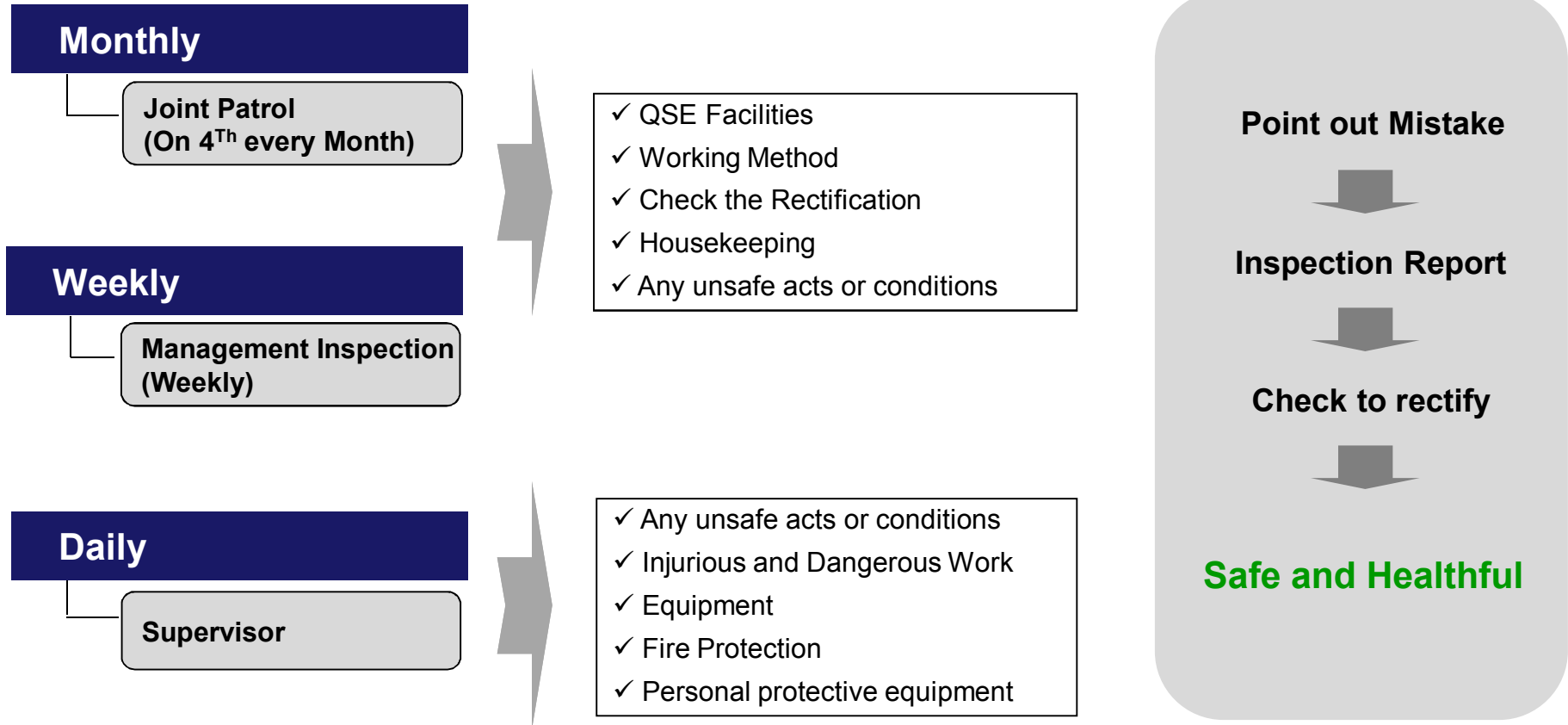
11. Safety Management System

3) Structure of the Safety Management System



11. Safety Management System

4) Audit Plan



11. Safety Management System

5) Safety Rewards

Achieving	2,000,000	Safe Man hours on PTTGC Aromatics Debottlenecking Project
Achieving	6,000,000	Safe Man hours on TOP SPP Project





THANK YOU



CAZ(THAILAND)CO.,LTD.

