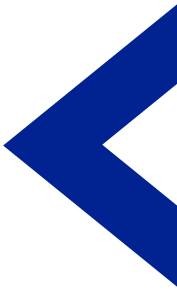


## Project Experiences List



### ☑ ITEM No.1

**Project Name:** PTT –Fourth Transmission Pipeline Midline Compressor Station (FTP-MCS) Project at Khao Hin Son, Phanom Sarakham, Chacheongsao Province.

**Owner:** PTT Public Company Limited.

**Main-contractor:** China Petroleum Pipeline Bureau (CPP)

**Sub-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

#### **Description of Projects/Services:**

- (1) Perform RT, MT, PT, PMI, UT, PAUT on Fabrication & Erection Piping Works about 43,000 DB.
- (2) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.

**Period:** October 2016 to November 2017

### ☑ ITEM No.2

**Project Name:** PTT Wangnoi Compressor Station Project located at Ayutthaya province.

**Owner:** PTT Public Company Limited.

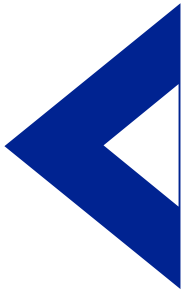
**Main-contractor:** Samsung Engineering Co., Ltd and Samsung Engineering (Thailand) Co., Ltd.

**Sub-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

#### **Description of Projects/Services:**

- (1) Perform RT, MT, PT, PMI, Ferrite Check, Hardness Test, UT, UTM on Fabrication & Erection Piping Works about 56,000 DB.
- (2) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.

**Period:** November 2017 to September 2018



### ☑ ITEM No.3

**Project Name:** COLD WATER GENERATION PLANT PROJECT

**Owner:** PTT LNG Company Limited (PTTLNG).

**Main-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

#### **Description of Projects/Services:**

- (1) Performed RT, MT, PT, PMI, Ferrite Check, Hardness Test, UT and UTM on Fabrication & Erection Piping Works about 50,000 DB and Tie-in work.
- (2) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.
- (3) Perform UT, RT and MT on Structural Steel Works
- (4) Perform RT, MT, PT and Vacuum test for Storage Tanks.

**Period:** November 2017 to September 2018

### ☑ ITEM No.4

**Project Name:** IN-PLANT POWER GENERATION PROJECT

**Owner:** PTT LNG Company Limited (PTTLNG).

**Main-contractor:** Samsung Engineering (Thailand) Co., Ltd.

**Sub-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

#### **Description of Projects/Services:**

- (1) Perform RT, MT, PT, PMI, and Ferrite Check on Fabrication & Erection Piping Works and Tie-in work.
- (2) Perform RT, UT, MT, PT on Pressure Vessels with ASME Certification Marks U Stamp with registration and procedure demonstration witnessed by AI of ABS Consulting, Inc.

**Period:** May 2018 to February 2019



☑ **ITEM No.5**

**Project Name:** 4,000 Tons Propylene Tank Project

**Owner:** PTT Tank Terminal Company Limited

**Main-contractor/Consultants:** CAZ (Thailand) Public Co., Ltd. /  
Worley Parsons Limited

**Sub-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

**Description of Projects/Services:**

- (1) Perform RT, PT, MT, UT and PAUT on Piping Fabrication and erection works, including Tie-in works total about 8,000 DB.
- (2) Perform RT, UT and MT for Structural Steel work, and RT MT PT for Pressure Vessels.

**Period:** November 2017 to November 2018

☑ **ITEM No.6**

**Project Name:** Olefins Reconfiguration Project (ORP Project)

**Owner:** PTT Global Chemical Public Co., Ltd.

**Main-contractor:** Samsung Engineering (Thailand) Co., Ltd. /  
TTCL Public Company Limited

**REC's Client:** Samsung Engineering (Thailand) Co., Ltd.  
GC Maintenance and Engineering Company Limited.

**Description of Projects/Services:**

- (1) Witness Hydrostatic Test of NG piping service by REC's registration Professional Engineer and Department of Energy Business's (DOEB) Representative.
- (2) Permit document endorsement by DOEB's registration company and Senior Professional Engineer then liaise with DOEB's Representative for final approved document.

**Period:** January 2020 to Present



☑ **ITEM No.7**

**Project Name:** Central Utility Plants 4 (CUP 4) Project Phase 1 (Co-Generation Power Plant Power 45 MW.)

**Owner:** Global Power Synergy Public Co., Ltd (GPSC)

**Main-contractor/Consultants:** CTCI (Thailand) Co., Ltd. / Poyry Energy Ltd.

**REC's Client:** CTCI (Thailand) Co., Ltd.

**Description of Projects/Services:**

- (1) REC perform PT, MT, PMI, RT, UT, UTM, Hardness Test and Ferrite Check on Fabrication & Erection Piping Works and Tie-in work about 60,000 DB
- (2) REC perform RT, PMI, Hardness, MT, PT ,Holiday test and PAUT in-lieu of RT on pipe rack dia. 18" length 5 KM. of Eastern Fluid Transport Company Limited (EFT) in Map Ta Phut Industrial Estate.
- (3) REC perform PT, MT, RT, PAUT on NG piping service and issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.
- (4) Witness Hydrostatic Test of NG piping service by REC's registration Professional Engineer and DOEB's Representative.

**Period:** July 2018 to July 2019



☑ **ITEM No.8**

**Project Name:** Olefins Reconfiguration Project (ORP Project)

**Owner:** PTT Global Chemical Public Co., Ltd.

**Main-contractor:** Samsung Engineering (Thailand) Co., Ltd. /  
TTCL Public Company Limited

**Sub-contractor/REC's Client:** CAZ (Thailand) Public Company Limited.

**Description of Projects/Services:**

(1) REC perform RT, PT, MT, UT, UTM, PAUT, Hardness Test and Ferrite Check on Fabrication shop, Module yard and Erection project site of Piping Works and Tie-in work about 580,000 DB.

- a. PAUT operator pass exam on PTT GC's specification and perform on pipe list below
  - i. Carbon and alloy steel P11, P22 (ASME IX P-4, P-5A) thickness minimum 17.12 mm. to 63.50 mm. and dia. minimum 4 inch to maximum 108 inch.
  - ii. Monel Alloy 400 Thickness 20.62 mm. dia. 80 inch.
- b. Perform RT on girth welds, branch connection welds and socket weld cover dia. minimum ¾ inch to 108 inch with maximum thickness 36 mm.
- c. Perform UT on branch connection welds dia. 108" to 42" Thickness 15 mm.

(2) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.

(3) REC perform RT, MT, UT on Fabrication shop, Module yard and Erection project site of Structural Steel Works about 6,060 Tons.

(4) REC supply AWS-CWI, QC Engineer and QC inspector on Fabrication shop, Module yard and Erection project site for Piping Works and Structural Steel Works.

**Period:** May 2019 to Present



☑ **ITEM No.9**

**Project Name:** Olefins Reconfiguration Project (ORP Project)

**Owner:** PTT Global Chemical Public Co., Ltd.

**Main-contractor:** Samsung Engineering (Thailand) Co., Ltd. /  
TTCL Public Company Limited

**Sub-contractor/REC's Client:** International Heat-Transfer Equipment Construction Co.,  
Ltd. (IHEC)

**Description of Projects/Services:**

- (1) REC perform RT, PT, MT, UT, UTM, PAUT and Hardness Test on Fabrication shop and Erection project site of Piping Works and Tie-in work about 120,000 DB.
  - a. PAUT operator pass exam on PTT GC's Specification and perform on pipe list below
    - i. Carbon and alloy steel P11, P22 (ASME IX P-4, P-5A) thickness minimum 17.12 mm. to 63.50 mm. and dia. minimum 4 inch to maximum 108 inch.
  - b. Perform RT on girth welds, branch connection welds and socket weld cover dia. minimum ¾ inch to 108 inch with maximum thickness 36 mm.
  - c. Perform UT on branch connection welds dia. 108" to 42" Thickness 15 mm.
- (2) Perform RT, PT, MT and UT for boiler and power piping with ASME Certification Marks (S & PP Stamp).
- (3) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.
- (4) REC perform RT, MT, UT on Fabrication shop and Erection project site of Structural Steel Works.

**Period:** May 2019 to Present



☑ **ITEM No.10**

**Project Name:** Olefins Reconfiguration Project (ORP Project)

**Owner:** PTT Global Chemical Public Co., Ltd.

**Main-contractor:** Samsung Engineering (Thailand) Co., Ltd. /  
TTCL Public Company Limited

**REC's Client:** TTCL Public Company Limited

**Description of Projects/Services:**

- (1) Perform RT, PT, MT, UT, PAUT and Hardness Test on Fabrication yard and Erection project site of Piping Works and Tie-in work about 100,000 DB.
  - a. PAUT operator pass exam on PTT GC's specification and perform on pipe below  
Carbon and alloy steel P11, P22 (ASME IX P-4, P-5A) thickness minimum 17.12 mm. to 63.50 mm. and dia. minimum 4 inch to maximum 108 inch.
- (2) REC issued certified letter NDE performed compliance with Department of Energy Business's (DOEB) Regulation (NG) and project specification requirement.
- (3) REC perform MT, UT on Erection project site of Structural Steel Works.
- (4) Witness Hydrostatic Test of NG piping service by REC's registration Professional Engineer and DOEB's Representative.
- (5) Permit document endorsement by DOEB's registration company and Senior Professional Engineer then liaise with DOEB's Representative for final approved document.

**Period:** May 2019 to Present



☑ **ITEM No.11**

**Project Name:** Bang Pa - Kong LPG Terminal Phase 3 Project

**Owner:** WP Energy Public Co., Ltd.

**Main-contractor/Consultants:** Takuni Group Public Company Limited. /  
ATT Consultants Company Limited (ATT)

**Sub-contractor/ REC's Client:** CAZ (Thailand) Public Company Limited.

**Description of Projects/Services:**

LPG sphere tank 4 Units at WP Bang Pa-Kong LPG Terminal, Chachoengsao Province.

Capacity 6,000 Cubic meter. 3 Units, I.D. 22.6 M., shell thickness 47-49 mm.

Capacity 1,000 Cubic meter. 1 Unit, I.D. 12.5 M., shell thickness 27-27.5 mm.

- (1) Perform MT, PT, UT demonstration procedures witnessed by AI of ABS Consulting, Inc. compliance with ASME Section VIII Div.2: 2017 Edition (U2 Stamp). RT demonstration radiograph reviewed by AI of ABS Consulting, Inc.
- (2) Perform PAUT qualification demonstration procedure and personnel under control of supervising Level III Examiner and AI of ABS Consulting, Inc. compliance with ASME Section VIII Div.2: 2017 Edition (U2 Stamp)
- (3) Perform NDE as below
  - a. MT on bevel, back gouge surface, all longitudinal welds (inside and outside) before PWHT and after removed temporary attachment welds surface.
  - b. UT manual on all nozzle welds (Categories D)
  - c. RT on all manhole, nozzle, weld neck flanges (Categories C)
  - d. PAUT In Lieu of RT on all longitudinal welds (Categories A) before PWHT

\*\*Continue next page





**☑ ITEM No.11 Continue.**

**Project Name:** Bang Pa - Kong LPG Terminal Phase 3 Project

**Owner:** WP Energy Public Co., Ltd.

**Main-contractor/Consultants:** Takuni Group Public Company Limited. /  
ATT Consultants Company Limited (ATT)

**Sub-contractor/ REC's Client:** CAZ (Thailand) Public Company Limited.

**Description of Projects/Services:**

- (5) Witness hydrostatic test and safety valves test of LPG spherical tank by REC's registration Professional Engineer and Department of Energy Business's (DOEB) Representative.
- (6) Compilation all concerned documents of LPG permit endorsement by DOEB's registration company and Professional Engineer then liaise with DOEB's Representative for final approved document.

**☑ ITEM No.12**

**Project Name:** HDD for Ethylene and Propylene UG 4 inch Pipeline Project

**Owner:** PTT Global Chemical Public Company Limited

**Main-contractor:** GC Maintenance and Engineer Company Limited

**Sub-contractor/ REC's Client:** Ace Engineering & Construction Co., Ltd.

**Description of Projects/Services:**

NG Pipe line 4 inch length 1.6 Km. 1 line and Pipe line 8 inch length 1.6 Km. 1 line.

- (1) REC perform MT, PT, RT, PAUT, Holiday Test and witness WQT
- (2) Witness Hydrostatic Test of Pipeline by REC's registration Professional Engineer and Department of Energy Business's (DOEB) Representative.

**Period:** April 2019 to September 2019



**☑ ITEM No.13**

**Project Name:** 20 Multi-Product Pipe Line at PTT Sriracha Oil Terminal Project (MSR)

**Owner:** PTT Public Company Limited.

**Main-contractor/Consultants:** SAS Tech Solution Co., Ltd. /  
Worley Parsons Limited

**Sub-contractor/ REC's Client:** SAS Tech Solution Co., Ltd. /  
Chart Karnchang Laemchabang Co., Ltd.

**Description of Projects/Services:**

Pipe line 20" offshore length 1.4 Km. and piping in tank farm.

(1) Perform RT, MT, PT, UT, UTM, PAUT on offshore pipeline during fabrication shop, fabrication yard, tank farm area, and offshore tie-in work accordance with API 1104/ASME B31.8 and PTT's project specification.

(2) 3<sup>rd</sup> party witness hydrostatic test and welder performance test.

**Period:** May 2019 to September 2019

**☑ ITEM No.14**

**Project Name:** Storage Tank Integrity Inspection

**Owner:** ESSO SRC Terminal

**Sub-contractor/ REC's Client:** Absolute Engineering Co., Ltd.

**Description of Projects/Services:**

Tank Floor Scan by Magnetic Flux Leakage (MFL)

**Period:** January 2018



☑ **ITEM No.15**

**Project Name:** Full Tank Inspection Interval by API 653 and DOEB. And shutdown inspection, CUI Inspection.

**Owner:** PTT Exploration and Production Public Company Limited.

**REC's Client:** PTT Exploration and Production Public Company Limited (PTT-EP)

**Description of Projects/Services:**

Full Tank inspection compliance with API 653 and DOEB

Scope of work

- i. Visual Inspection
- ii. Thickness Measurement
- iii. Tank Floor Scan – (MFL)
- iv. Vacuum Box Test
- v. Settlement Survey
- vi. Plumbness
- vii. Roundness
- viii. Magnetic particle inspection
- ix. Remaining Life Assessment

**Place:** Suphan-buri Province plant:

May 2018 Storage tank 2 Units. Full Tank Inspection

July 2018 Storage tank 17 Units. Annual inspection

July 2018 In-service Piping Inspection 378 lines.

June 2019 Storage tank 25 Units, Vessel 14 Units. Annual inspection

Sin Phu Hom plant Khon Kaen Province: December 2018

Visual Inspection, Thickness Measurement, Tube inspection (RVI, IRIS),  
Magnetic particle inspection, RVI

December 2018: In-service Piping Inspection 8 lines. Vessel 7 Units

September 2019: Vessel 16 Units



## ☑ ITEM No.16

**Project Name:** Inspection Distillation Equipment Static and Piping Process during Shutdown

**Owner:** Bangchak Bioethanol - Chachoengsao Co., Ltd.

**REC's Client:** Bangchak Bioethanol - Chachoengsao Co., Ltd.

**Description of Projects/Services:**

Visual Inspection,  
Thickness Measurement, RT Profile  
Tube inspection (RVI, IRIS),  
MT, PT

**Period:** June 2018, Tank 24 units, Vessel 7 units, Column 4 units and Heat exchanger 17 units.

May 2019, Tank 6 units, Vessel 7 units, Column 4 units, Heat exchanger 19 units and Boiler tube inspection 2 units.

## ☑ ITEM No.17

**Project Name:** Piping and CUI Inspection

**Owner:** PTT Oil and Retail Business Public Co., Ltd

**REC's Client:** PTT Oil and Retail Business Public Co., Ltd

**Description of Projects/Services:**

Visual Inspection, Thickness Measurement, Remaining Life Assessment,  
Route line Isometric DWG.

**Place:** Pra Kha Nong Terminal:

November 2017-February 2018: In-service piping Inspection 480 lines

Saraburi Terminal:

2018: In-service Piping Inspection 135 lines.

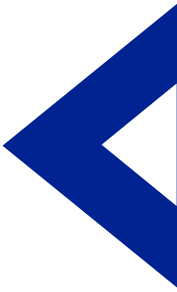
Lum Luk ka Terminal:

2019: In-service Piping Inspection 321 lines.

Songkha Terminal:

2020: Storage tank dia. 10 M. Total 2 Units, Annual inspection.

Scope of work: Visual Inspection, Settlement Survey, Plumpness



### ☑ ITEM No.18

**Project Name:** Pressure Vessel Inspection 2019

**Owner:** Thai Ethoxylate Co., Ltd

**REC's Client:** Thai Ethoxylate Co., Ltd

**Description of Projects/Services:**

Visual inspection Internal/External, Thickness Measurement, Tube inspection (RVI, IRIS), Magnetic particle inspection, Pressure test

**Period:** December 2018: Vessel 3 units, Piping 9 line  
May 2019: Vessel 3 units.

### ☑ ITEM No.19

**Owner:** Thai Plastic and Chemicals Public Co., Ltd

**REC's Client:** Thai Plastic and Chemicals Public Co., Ltd

**Description of Projects/Services:**

- (1) Supply QC Inspector for quality control check fit-up, VT finish weld & PT during fabrication and erection work in turnaround period.
- (2) Perform PAUT on Hastelloy C-276 dia. 3 inch, Thickness 5.54 mm.
- (3) RT Inspection for boiler tube in furnace.

**Project Name:** VCM1 TA2018 (19 Day), Supply QC Inspector 11 person  
VCM2 TA2018 (17 Day), Supply QC Inspector 10 person  
VCM1 TA2019 (22 Day), Supply QC Inspector 10 person  
VCM2 TA2019 (22 Day), Supply QC Inspector 9 person



☑ **ITEM No.20**

**Owner:** Electricity Generating Authority of Thailand (EGAT)

**REC's Client:** Electricity Generating Authority of Thailand (EGAT)

**Project Name:** Supply Certified Welding Inspector (CWI), Mae Moh Power Plant, Lampang Province.

**Description of Projects/Services:** Supply AWS-CWI for quality of welding in during boiler tube replacement.

**Period:** October, 2019 (15 Day)  
November, 2019 (22 Day)  
December 2019, (18 Day)

**Project Name:** Boiler Inspection, North Bangkok Power Plant

**Description of Projects/Services:**

Supply Inspector 6 person for Visual Inspection, Thickness Measurement, and Liquid Penetrant inspection on Maintenance shutdown boiler 2 units.

**Period:** October 2019

☑ **ITEM No.21**

**Project Name:** Bang Pakong Combined Cycle Power Plant (Units 1, 2 replacement)

**Owner:** Electricity Generating Authority of Thailand (EGAT)

**Main-contractor/:** Italian Thai development / Black & Veatch (Thailand) Ltd.

**Sub-contractor/ REC's Client:** RMS Quality Co., Ltd. / Italian Thai development

**Description of Projects/Services:**

- (1) Certify Boiler (Design Appraisal, Fabrication, Installation, Commissioning as following Thai regulation specify)
- (2) Perform RT, MT and PT on pipe erection at Bang-Pakong site

**Period:** October 2019-Present



## ☑ ITEM No.22

**Project Name:** TA2020

**Owner:** JSR BST Elastomer Co., Ltd.

**REC's Client:** JSR BST Elastomer Co., Ltd.

**Description of Projects/Services:**

- (1) Visual Inspection,
- (2) Thickness Measurement,
- (3) Tube inspection (RVI, IRIS, EFT)
- (4) MT, PT
- (5) Helium leak test
- (6) PAUT
- (7) High Voltage Spark Testing

**Period:** November 2019, Tank 2 units, Annual inspection.

Scope of work: Visual Inspection, Settlement Survey, Plumbness

Mar 2020: Tank 3 units, Vessel 13 units, Column 2 unit, Heat Exchanger 15 units. Mechanical part 22 units.

## ☑ ITEM No.23

**Project Name:** Storage tank inspection

**Owner:** NS BlueScope (Thailand) Limited

**REC's Client:** NS BlueScope (Thailand) Limited

**Description of Projects/Services:**

Tank 6 Units, Full Tank inspection compliance with API 653 and DOEB,

- i. Scope of work
- ii. Visual Inspection
- iii. Thickness Measurement
- iv. Tank Floor Scan – (MFL)
- v. Vacuum Box Test
- vi. Settlement Survey
- vii. Plumpness
- viii. Roundness

**Period:** February 2019,



## ☑ ITEM No.24

**Project Name:** KSP Factory Renewal Project

**Owner:** Kumphawapi Sugar Company Limited

**REC's Client:** Guangxi Construction Engineering Group Yian (Thailand) Co., Ltd.

**Description of Projects/Services:**

- (1) Structural Steel Works: UT, MT, PT
- (2) Storage Tank 4 Ea. according to API 650 : RT, PT, Vacuum Box Test
- (3) RT boiler tube
- (4) PAUT and RT on Vessel 22 Ea. according to ASME VIII Div. 1

**Period:** April 2018 - October 2019

## ☑ ITEM No.25

**Project Name:** Yearly fabrication and erection of piping and structural work for PTTGC's maintenance project.

**Owner:** PTT Global Chemical Public Company Limited (PTTGC)

**Fabricators/REC's Client :** Rayong Intania Co., Ltd. (RIC)

- : Alliance Service Company Limited (ASC)
- : Industrial Construction & Maintenance Services (ICS)
- : Ace Engineering & Construction Co., Ltd. (ACE)
- : Renewcoils Engineering & Supply Co., Ltd. (RNC)
- : Union Construction & Supply Company Limited (UCS).
- : Kongpatana Engineering & Construction Co., Ltd. (KEC)

**Description of Projects/Services:**

- (1) Perform conventional NDT: MT, UT, PT, RT, PMI, Ferrite Check, Hardness Test, and UTM.
- (2) 3<sup>rd</sup> party witness WPS, PQR, WQT, weld visual exam by AWS-CWI.
- (3) Perform PAUT with operator pass exam with PTT GC's specification.

On new-construction and in-service maintenance inspection at each fabrication shop and PTT GC's plant such as

Branch 2: Olefin I-1 Plant, Branch 3 (GC3): Olefin 2 Plant,

Branch 4 (GC4): Aromatics 1 Plant, Branch 5 (GC5): Aromatics 2 Plant

Branch 6 (GC6): Refinery (Gate 4), Branch 8 (GC8): Aromatics Tank Farm

Branch 11 (GC11): Olefins 3 Plant, Branch 12 (GC12): Polyethylene Plant

**Period:** January 2018 - Present



**☑ ITEM No.26**

**Project Name:** Turnaround at branch 3 (GC3): Olefin 2 Plant.

**Owner:** PTT Global Chemical Public Company Limited (PTTGC)

**REC's Client :** PTT Global Chemical Public Company Limited (PTTGC)

**Description of Projects/Services:**

- (1) Supply Inspector for turnaround period at branch 3 (GC3): Olefin 2 Plant preform Visual, PT, ferrite check and PMI on piping for each fabricators during erection work.

**Period:** January 2020

Issue date: 1/4/2020

**REC**  
Rajchupleuk Engineering



**Miss. Vimvipha Thongnoppakoon**  
**NDT Manager**

**Prepared by**



**Mr. Jirawat Sukkanta**  
**Deputy Managing Director**

**Reviewed by**



**Mr. Udom Meephaungpol**  
**Managing Director**

**Approved by**