

<b>NSRP</b> <b>STG3 Replacement Project</b>	 <b>Nghi Son Refinery and Petrochemical Limited Liability Company</b>	<b>Doc. No.</b>	
		<b>Rev. A</b>	<b>Page 1 of 5</b>
Contractor Job No.:		<b>Date:</b>	

## TECHNICAL REQUISITION FOR OVERHAUL MAIN CONDENSER


Unit No.: **Not Applicable**

Unit Abbreviation.: -

Document Class: Z

Issue Purpose	
---------------	--

Rev	Date	Page	Description	Prepared by PTSC	Reviewed by PTSC	Approved by PTSC
A		All	First Issue			

<b>NSRP STG3 Replacement Project</b>			Rev. A
<u>Document Title:</u> Technical Requisition for overhaul main condenser		Doc. No.:	<b>Page 2 of 5</b>

**Contents**

**1. GENERAL INFORMATION/ DESCRIPTION .....3**

**2. SCOPE OF WORK.....3**

**2.1. Provide completion service.....3**

**2.1.1. Basic scope of work as bellow: .....3**

**2.1.2. Code and standard .....4**

**2.1.3. Contractor’s responsibility.....4**

**3. Safety requirement: .....5**

**4. ATTACHMENT .....5**

## 1. GENERAL INFORMATION/ DESCRIPTION

The primary objective of this document is to establish the minimum technical requirements for the cleaning, inspection, and repair of the Main Condenser. The overhaul aims to restore the condenser's thermal design efficiency, ensure vacuum tightness, and extend the asset's life by maintaining its structural and mechanical integrity.

The information main condenser 113-ST-301-E01:

NO.	DESCRIPTION	MATERIAL	Q'TY		SIZE	REMARK	DESIGN DATA			
			WORK	SPARE			FLUID Q'TY		SHELL SIDE	TUBE SIDE
1	SHELL BODY	A516-70	1		t18				STEAM	COOLING WATER
2	SHELL BODY	A516-70	2		t18					
3	W/B INLET/OUTLET SHELL	A516-70	1		t18			QUANTITY	147700 Kg/hr	8,839 m <sup>3</sup> /hr
4	W/B REVERSING SHELL	A516-70	1		t18			OPERATING PRESS.	0.01234 MPa A	— MPa G
5	HEAD (2:1 ELLIP.)	A516-70	1		t18 (MIN. 15.3)			OPERATING TEMP. (IN/OUT)	50.0 / — °C	34.0 / 43.0 °C
6	TUBE SHEET	A516-70+B265-GR.1	2		t73 (70+MIN.3.0 CLAD)			DESIGN PRESS.(=MAWP)	MPa G	0.1 / F.V
7	COOLING TUBE	B338-GR.2(ERW)	4124		0.025x(Avg.)10.5-6924L			DESIGN TEMP.	°C	95
8	COOLING TUBE (AIR ZONE)	B338-GR.2(ERW)	218		0.025x(Avg.)10.5-6924L			TEST	HYDRO°C	—
9	CHANNEL FLANGE	A266-GR.2	3		t70			PRESS.	PNEUM°C	MPa G
10	CHANNEL COVER	A266-GR.2	1		t75					0.2
11	STUD BOLT/2HEAVY NUTS	A193-B7/A194-2H	200	100	M30x3p-235L			POST WELD HEAT TREATMENT		NO
12	STUD BOLT/2HEAVY NUTS	A193-B7/A194-2H	100	100	M30x3p-240L			RADIOGRAPHY		NO
13	CHANNEL GASKET	RUBBER	2	100	t5	IN/OUT W/B		JOINT EFFICIENCY		0.7
14	CHANNEL GASKET	RUBBER	1	100	t5	REVERSING W/B		CORR. ALLOWANCE	mm	0.8
15	TUBE SUPPORT PLATE	A283-C	10		t14			PASS PER SHELL		1
16	SADDLE SUPPORT	A516-70/A263-C	2	100	t18/t25/t30/t35			INSULATION	mm	NO
17	EARTH LUG	A240-304	2		t6			SURFACE AREA	m <sup>2</sup>	2,311
18	FOUNDATION BOLT/3 NUTS/P.W	A307-B/A563-A	16	4	M30 x 450L	GALVANIZED		TUBE SIZE / TUBE Q'TY		O.D 25.0 x 10.5(AVG.) — 6924L / 4342 EA
19	FOUNDATION BOLT/3 NUTS/P.W	A307-B/A563-A	4	100	M30 x 450L	GALVANIZED		TUBE PITCH	mm	32 Δ
20	NAME PLATE BRACKET	A283-C	1		t4.5			TUBE TO TUBE SHEET JOINT		HEAVY EXPANDING WITH TWO GROOVES+SEAL WELD
21	FLASH CHAMBER	A516-70	1		t18			CODE		ASME SEC. VII DIV.1 13ED., WITHOUT STAMP, HEI 100% & DONGHWA STD.
22	Fe ANODE	Fe	48		185x200x200	FOR 4 YEAR		MDMT	°C	0
							WEIGHT	EMPTY	TON	72.0
								OPERATING		107.0
								FULL WATER		152.0

Total tubes: 4124 + 218 = 4342 (Tubes)

Tube Dimensions: 6924LxO.D25Xt0.5

Hot well dimension: 3000Lx2100Lx2600H


## 2. SCOPE OF WORK

### 2.1. PROVIDE COMPLETION SERVICE

#### 2.1.1. BASIC SCOPE OF WORK AS BELLOW:

The contractor shall be responsible for carrying out overhaul the main condenser including but not limited:

- Cleaning the water box (Channel), hot well, shell, tube inside, tube outside, tube sheet and nozzle
- Tube criterial of cleaning for visual surface to be clear of sludge, loose scales, grease/oil, other contaminats and water. Cleaned metal surface should appear similar to grad St-2 of ISO 8501-1 or WJ-3 of SSPC NACE VIS-4 standards. However a thin transparent oil film need not be removed if it does not hide the metal surface The component to be examined should be dry and clean as much as possible and free from any blockages.
- Repair the defect after inspection include but not limited to plug the tube ...

<b>NSRP STG3 Replacement Project</b>			Rev. A
<u>Document Title:</u> Technical Requisition for overhaul main condenser	Doc. No.:	<b>Page 4 of 5</b>	

- Conduct the hydrostatic test/ pneumatic test follow the ITP and instructions the OEM/ NSRP. See the file: "Pressure test determination for static equipment & piping" attached.
- Follow the standard code at item "4.1.2. Code and standard" and NSRP standard.

### 2.1.2. CODE AND STANDARD

All works shall be performed in strict accordance with the latest editions of:

- **HEI Standards:** Standards for Steam Surface Condensers.
- **ASME BPVC Section VIII:** Boiler and Pressure Vessel Code.
- **WJTA-IMCA:** Industry Best Practices for High-Pressure Waterjetting.
- **ASTM G134:** Standard Test Method for Erosion of Solid Materials by Liquid Jet.
- **ISO 8501-1:** Preparation of steel substrates before application of paints and related products.

### 2.1.3. CONTRACTOR'S RESPONSIBILITY.

The Contractor shall provide all required expertise, manpower, equipment, materials, consumables, and associated services to successfully perform and complete the Work Order, ensuring full compliance with NSRP's technical specifications, quality requirements, safety regulations, and execution timeline.

Provide manpower, tools and equipment including special tools/equipment/services and materials/consumables to perform the service as per the Work Order issued by NSRP.

Provide materials including specification with detailed material properties, product datasheets, MSDS, and warranty documents for NSRP's review and approval.


Conduct site-survey to collect input data for engineering analysis/ calculation/ develop working procedure and materials take-off as per requirements of Work Order from NSRP.

The Contractor shall ensure the availability of a Quality Control and Assurance system, including:

- QA/QC procedures aligned with NSRP requirements and relevant international standards,
- Inspection checklists and documentation for each step of surface preparation, primer, wrapping, jacket installation,
- Material traceability and proper record keeping.

The Contractor shall ensure all works are performed by trained and certified personnel, and shall:

- Provide adequate PPE and marine safety equipment (life jackets, lifelines, fall protection),
- Ensure marine access platforms or scaffolding are properly engineered and safely erected,
- Coordinate with NSRP for daily permit issuance and safety inspection.

<b>NSRP STG3 Replacement Project</b>			Rev. A
<u>Document Title:</u> Technical Requisition for overhaul main condenser	Doc. No.:	<b>Page 5 of 5</b>	

**Mobilization:** The Contractor is responsible for the timely mobilization of all specialized

### 3. SAFETY REQUIREMENT:

Complying with occupational safety and health in accordance with current legal regulations.

Contractor has responsible to prepare and provide full PPEs/ SPPE but not limited to complete the service as required.

Complying the safety requirements and regulations when perform tasks at NSRP according to Contractor safety management document.

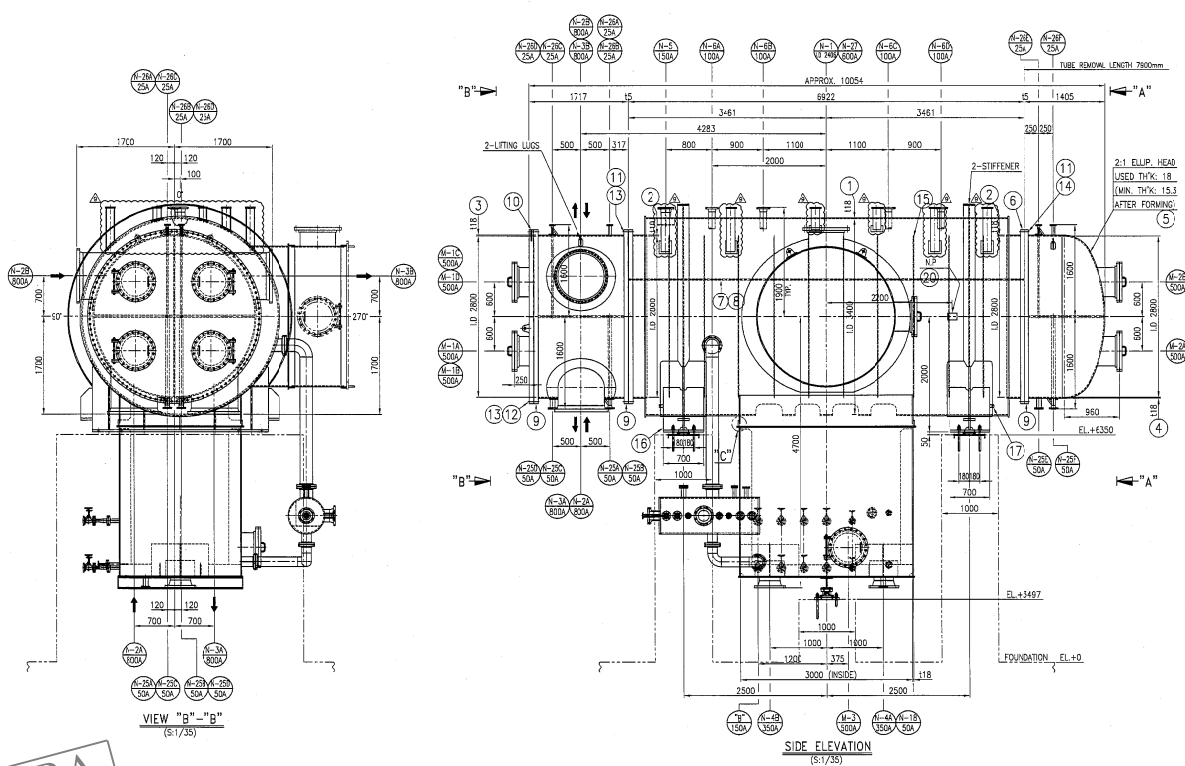
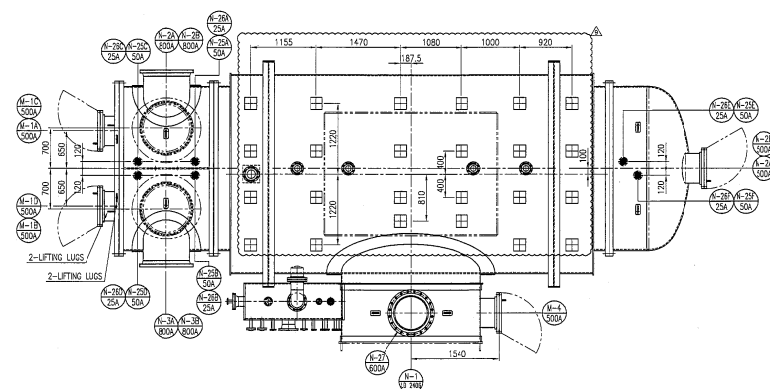
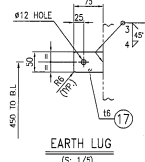
Comply with all internal NSRP safety procedure such as:

- **MD-04-HSE-HS-PD-003** (Permit to Work Procedure)
- **MD-04-HSE-HS-PD-004** (JSA and Safe Work Method Statement procedure)
- **MD-04-HSE-HS-PD-059** (Working at height procedure)
- **MD-04-HSE-HS-PD-043** (Electrical safety procedure)
- **MD-04-HSE-HS-PD-012** (Safe isolation and Lock out Tag out procedure)
- **MD-04-HSE-HS-PD-027** (Safety golden rule)
- **MD-04-HSE-HS-PL-008** (Onshore traffic safety management plan)
- **MD-04-HSE-HS-PD-002** (Hand tool and portable Equipment safety procedure)
- **MD-04-HSE-HS-PD-009** (Procedure for Routine Waste collection and Transpotion inside NSRP refinery)
- **MD-04-HSE-ES-PL-007** (Waste Management plan)
- **MD-04-HSE-HS-PD-059** (Manual handling Procedure)
- **2210250203-MD-04-HSE-HS-PD-029** Confined Space Entry Procedure

### 4. ATTACHMENT

- Attachment 1: Main Condenser drawing/ data sheet

Item	Item Description	PTSC TH	Contractor
<b>A</b>	<b>Mobilize/Demobilize equipment</b>		
1	Crane/ folk lift/Lifting gear for lift/drop for setting up and demob tool and equipment clamp inside NSRP.		x
2	Transport tool and equipment from outside in/out appointed locations in NSRP plant.		x
3	Transport as demobilization after complete work		x
<b>B</b>	<b>SPPE, Equipment and Material</b>		
1	Electric Generators with secondary dip tray with proper earthing for completing service.		x
2	Distribution CB box with necessary cables lighting led band and connection socket for service work.		x
3	Lifting manually with lifting gears lifting accessories		x
4	Hydraulic jack sets and accessories		x
5	Ventilation fans and hose lighting for confined space.		x
6	Cutting/Grinding machine and consumable (Cutting discs grinding disc drilling drilling tips...)		x
7	Fire blankets for hot work		x
8	Nylon Canvas for weather protection		x
9	Extiguishers with valid certificate		x
10	Torque wrench/Tensioning with valid 3rd party certificate for installation clamp		x
11	Transportation truck with fire arrester of outlet		x
12	Fuel and fuel tanker for running equipment		
13	Insulation work		x
14	Scaffolding work		x
15	Painting for clamp		x
16	Service water utility LP steam Plant air		x
17	SCBA Air Line Trolley (If need)		x
18	Dust coverall chemical coverall chemical gloves half mask and filters face mask and filters		x
19	Heat resistant suits flame returdant suits (Helmets Gloves Shoes Trouser Cloth Face shield....)		x
20	Consumable and accessories come along with equipment for completing service work		
<b>C</b>	<b>Health Safety Security and Environment (HSSE) and Medical Facilities others.</b>		
1	Provision of all safety signs typically confined space restrictions falling object keep clear PPE notification barrier tapes etc.		x
2	Disposal of all waste follow NSRP procedure MD-04-HSE-ES-PL-007 last revision		x
3	Lightning/Typhoon Alerts Electronic ID card LOTO Device		x
4	First aid within the Refinery and Ambulance/transportation to hospital		x
5	Temporary shelters meal Talkie Talkie Gas detector H2S escape mask		x
6	Transportation.		x
7	Shelters containers for material-tool and store keepers		x



NO.	DESCRIPTION	MATERIAL	QTY (W/OUT TOL)	SIZE	REMARK	DESIGN DATA			
1	SHELL BODY	A516-70	2	118		SHELL SIDE		TURB SIDE	
2	SHELL BODY	A516-70	2	118	FLUID QTY		STEAM		COOLING WATER
3	W/B INLET/OUTLET SHELL	A516-70	1	118	QUANTITY		147000	kg/hr	8.839 m <sup>3</sup> /hr
4	W/B REVERSING SHELL	A516-70	1	118	OPERATING PRESS		0.0234	MPa	A
5	HEAD (21" DIA.)	A516-70	1	118	OPERATING TEMP. (W/OUT TOL)		°C		34.0 / 43.0
6	HEAD (21" DIA.)	A516-70	1	118	DESIGN TEMP. (W/OUT TOL)		°C		34.0 / 43.0
7	COOLING TURB	8338-GR2ERW	214	0.0254x0.303x5.0824	DESIGN TEMP. (W/OUT TOL)		°C		34.0 / 43.0
8	COOLING TURB (AIR ZONE)	8338-GR2ERW	214	0.0254x0.303x5.0824	DESIGN TEMP. (W/OUT TOL)		°C		34.0 / 43.0
9	CHANNEL FLANGE	A286-GR2	3	175	TEST		HYDRO		1.5
10	CHANNEL COVER	A286-GR2	3	175	TEST		PNEUM		1.5
11	STUD BOLT/2HEAD NUTS	A193-B7/1/18-14	100	M30x3-235L	STUD WELD-NUT TREATMENT				
12	STUD BOLT/2HEAD NUTS	A193-B7/1/18-14	100	M30x3-240L	RADIOGRAPHY				
13	CHANNEL GASKET	RUBER	2	4	N/OUT W/B		JCT EFFICIENCY		0.7
14	CHANNEL GASKET	RUBER	2	4	REVERSING W/B		JOINT ALUMINUM		0.9
15	TURB SUPPORT PLATE	A286-C	1	118	PASS PER SHELL		1	2 (DIVIDED TYPE)	
16	SADDLE SUPPORT	A286-C	2	118/125/30/135	INSULATION				
17	FLAT LUG	A286-C	2	48	SURFACE AREA		m <sup>2</sup>		2.311
18	FLAT LUG/2 NUTS	A286-C/A534-B	4	M30 x 60L	FLAT LUG / TURB QTY		0.0 2.0 ± 0.5 (MAX)	100% / 100% EX	EX
19	FLAT LUG/2 NUTS	A286-C/A534-B	4	M30 x 60L	GALVANIZED				
20	NAME PLATE BRACKET	A286-C	1	14.5	TURB FRON				
21	FLAT LUG	A286-C	1	118	TURB TO TURB SHEET JOINT				
22	FLAT CHAMBER	A286-C	1	118	HEAVY EXPANDING WITH TWO PROOFS-SHAFT JOINT				

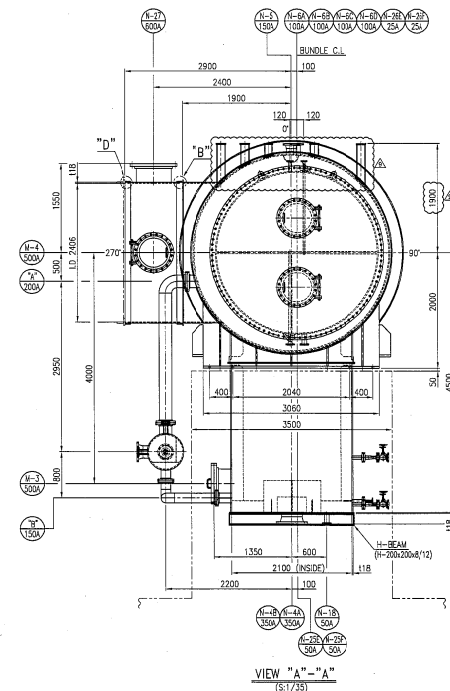
## NOTES

1. ALL BOLT HOLES SHALL BE STRADDLE TO MAIN AXES OF CONDENSER UNLESS OTHERWISE NOTED
2. PAINTING SCHEDULE : REFER TO PAINTING SPEC.
3. WATER BOX INSIDE : RUBBER LINING(13) WITH 5- ANODE (4 YEARS)

ANODE (4-YEAR)		
INLET 1	6	EA
INLET 2	6	EA
OUTLET 1	6	EA
OUTLET 2	6	EA
REVERSING 1	12	EA
REVERSING 2	12	EA
TOTAL	48	EA

WEIGHT	EMPTY	TON	72.0
	OPERATING		107.0
	FULL WATER		152.0

LIST OF NOZZLE							
POINT NO.	MARK NO.	NO. RESQ.	SIZE mm (in)	RATING	DESIGNATION	PIPING SCH.	FROM C/L
-	N-1	1	101 (40)		STEAM REL.	118	REF. COM.
-	N-2	2	804 (32)	ASME 1500 W/LR	SEA COOLING WATER INLET	118	
-	N-3	2	804 (32)	ASME 1500 W/LR	SEA COOLING WATER INLET	118	
-	N-4	2	1504 (60)	ASME 1500 W/LR	SEA COOLING WATER INLET	118	
-	N-5	1	1504 (60)	ASME 1500 W/LR	CONDENSATE RETURN WATER IN	42	
-	N-6	4	1504 (60)	ASME 1500 W/LR	CONDENSATE RETURN WATER IN	42	
-	N-7	4	1504 (60)	ASME 1500 W/LR	NON-CON. GAS OUTLET	80	
-	N-8			= BLANK =			
-	N-9	1	254 (10)	ASME 2500 W/LR	MAN. STOP VALVE DRAIN		
-	N-10	1	254 (10)	ASME 2500 W/LR	BLANK LINE DRAIN		
-	N-11	1	2504 (81)	ASME 1500 W/LR	SEA STEAM	80	
-	N-12	1	254 (10)	ASME 2500 W/LR	EXTRACT & INDUCT. DRAIN		
-	N-13	1	254 (10)	ASME 2500 W/LR	WINDUP SUSPECT CONDENSATE		
-	N-14	1	254 (10)	ASME 2500 W/LR	TURBINE SUSPECT CONDENSATE		
-	N-15	1	254 (10)	ASME 1500 W/LR	SPARE (N/B)		
-	N-16	1	254 (10)	ASME 1500 W/LR	SPARE (N/B)		
-	N-17	3	304 (12)	ASME 3000 S.O.R.	DEVELOPMENT WATER		
-	N-18	2	304 (12)	ASME 3000 S.O.R.	LOW TEMPERATURE (N/B) VITE 160/160		
-	N-19	2	304 (12)	ASME 3000 S.O.R.	LOW TEMPERATURE (N/B) VITE 160/160		
-	N-20	2	304 (12)	ASME 3000 S.O.R.	LOW TEMPERATURE (N/B) VITE 160/160		
-	N-21	2	304 (12)	ASME 3000 S.O.R.	LOW TEMPERATURE (N/B) VITE 160/160		
-	N-22	2	304 (12)	ASME 3000 S.O.R.	TEMP. GAUGE (N/B) VITE 160		
-	N-23	1	304 (12)	ASME 3000 S.O.R.	LEVEL GAUGE	180	
-	N-24	3	304 (12)	ASME 1500 W/R	DRAINAGE (WATER BOX)		
-	N-25	3	304 (12)	ASME 1500 W/R	DRAINAGE (WATER BOX)		
-	N-26	3	304 (12)	ASME 1500 W/R	DRAINAGE (WATER BOX)		
-	N-27	1	1004 (40)	ASME 1500 S.O.R.	RUPTURE DISCH.	118	
-	N-28	1	1504 (60)	ASME 1500 S.O.R.	FLASH CHAMBER STEAM CONNECTION	80	
-	N-29	1	1504 (60)	ASME 1500 S.O.R.	FLASH CHAMBER DRAIN	80	
-	N-30	1	254 (10)	ASME 2500 W/LR	WINDUP SUSPECT CONDENSATE		
-	N-31	1	254 (10)	ASME 2500 W/LR	TURBINE SUSPECT CONDENSATE		
-	N-32	1	254 (10)	ASME 2500 W/LR	MANHOLE (N/B) VITE 118		
-	N-33	1	254 (10)	ASME 2500 W/LR	MANHOLE (N/B) VITE 118		
-	N-34	1	254 (10)	ASME 2500 W/LR	MANHOLE (N/B) DISCH. OUT	118	
-	N-35	1	254 (10)	ASME 2500 W/LR	CONDENSATE WASTE		
-	N-36	1	254 (10)	ASME 2500 W/LR	SPUR LINE FOR SEAM CHAMBER	80	
-	N-37	1	254 (10)	ASME 2500 W/LR	SEA STEAM DRAIN		SEE COM.
-	N-38	1	254 (10)	ASME 2500 W/LR	TURBINE CASING DRAIN		SEE COM.



△	REVISED BY COMMENTS	2015. 01. 20	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY COMMENTS	2014. 11. 03	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY DHE	2014. 11. 03	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY DHE	2014. 09. 24	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY COMMENTS	2014. 08. 06	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY DHE	2014. 07. 02	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY COMMENTS	2014. 06. 18	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY COMMENTS	2014. 05. 16	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	REVISED BY COMMENTS	2014. 04. 30	H.Y. RYU	Y.H. CHOI	D.S. KIM
△	FOR APPROVAL	2014. 04. 11	H.Y. RYU	Y.H. CHOI	D.S. KIM
WK	DESCRIPTION	DATE	DWY	CK'D	APPR

CUSTOMER: MITSUBI ENGINEERING & SHIPBUILDING CO., LTD.

PROJECT	NSRP COMPLEX PROJECT
---------	----------------------

TITLE	MAIN CONDENSER GENERAL ASSEMBLY (1/2)
113-A-003:113-S1-301-ED1	
113-A-004:113-S1-401-ED1	

<b>DongHwa Entec</b>		 THIRD ANGLE	
SCALE	NO. OF SET	PROJECT NO.	REV.

SEE DWG	2 sets	P5104001/P5105001	9
	DWG. NO.		

		DHPB - P5104001 - C1	
SALE NAME	DWC \ P5104001-01		

SMPL FORM 5010 \ F5104001-01





# SURFACE CONDENSER DATASHEET

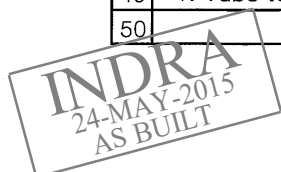
1	Customer	M.E.S	Manufacturer	DONGHWA ENTEC
2	Project	NSRP COMPLEX PROJECT		
3	Plant Location	VIETNAM		
4	Job No.	TM2156-A/B	Item No.	TM2156-A:113-ST-301-E01 TM2156-B:113-ST-401-E01
5	Date	JUN. 26. 2014	Rev. No.	2

## DESIGN CONDITION (THERMAL)

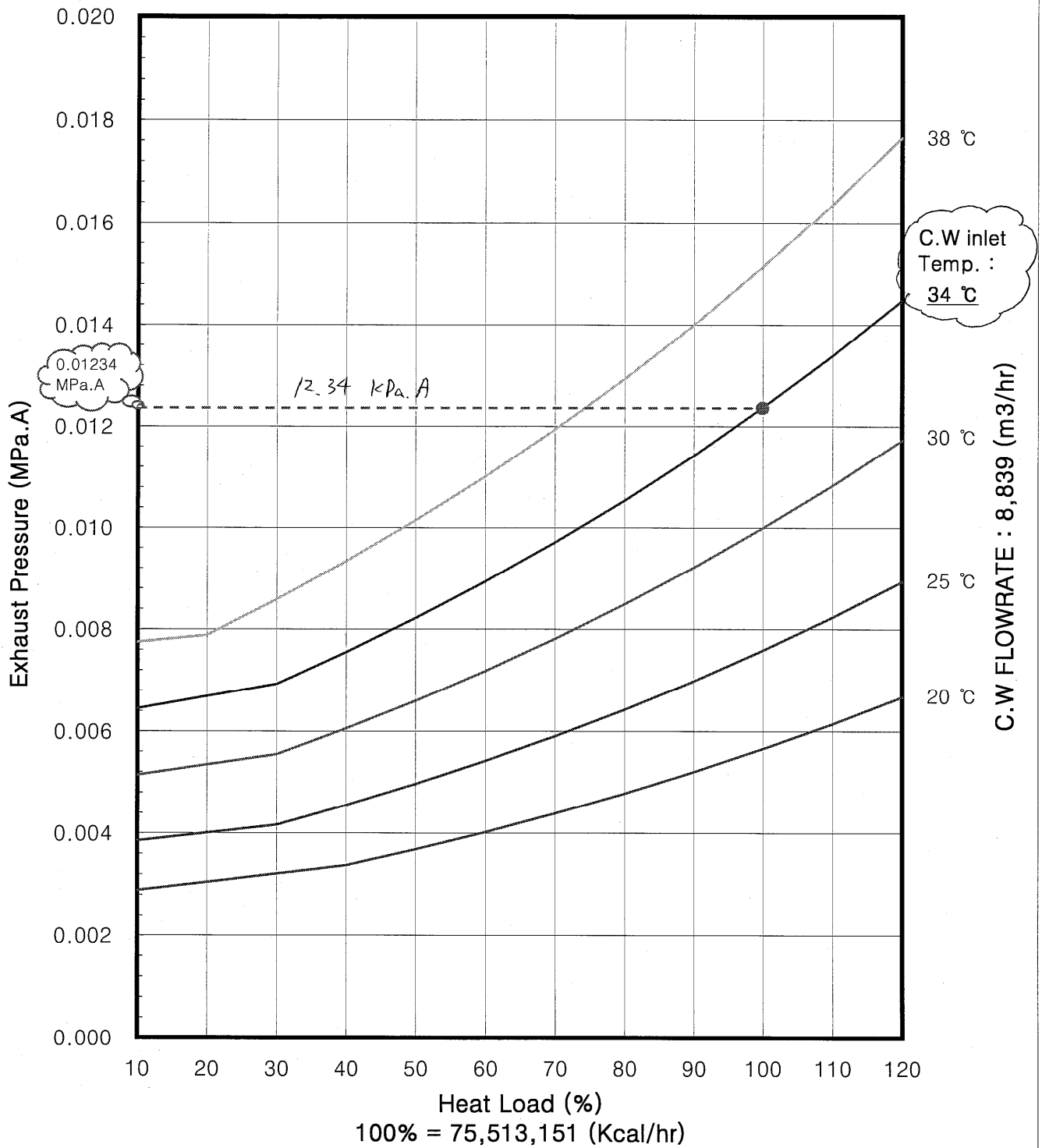
6	SHELL SIDE		TUBE SIDE	
7	Heat Duty	75,513,151 (kcal/hr)	Source of Water	SEA WATER
8	Steam Inlet Flowrate	147,700 (kg/hr)	Cooling Water Flowrate	8,839 (m <sup>3</sup> /hr)
9	Heat Transfer Rate	3,021.00 (kcal/°C.m <sup>2</sup> .hr)	Water Inlet Temp.	34.0 (°C)
10	Steam Sat. Temp.	50.0 (°C)	Water Outlet Temp.	43.00 (°C)
11	LMTD	10.9 (°C)	No. of Pass	2
12	Steam Inlet Pressure	12.34 (kPa.A)	Water Velocity	2.5 (m/s)
13	Surface Area	2,311 (m <sup>2</sup> )	Pressure Drop (Allowable)	60.0 (kPa)
14	Cleaning Factor	80%	Pressure Drop (Calculated)	46.8 (kPa)
15	Fouling Factor	- (°C.m <sup>2</sup> .hr/kcal)	Fouling Factor	- (°C.m <sup>2</sup> .hr/kcal)

## CONSTRUCTION (MECHANICAL)

16	SHELL SIDE		TUBE SIDE	
17	Design Pressure	0.1 & F.V (MPa.G)	Design Pressure	1.0 (MPa.G)
18	Design Temp.	95 (°C)	Design Temp.	65.0 (°C)
19	Test Pressure	0.2 (MPa.G)	Test Pressure	1.5 (MPa.G)
20	WATERBOX			
21	Type	DIVIDED TYPE	NO. OF SHELL	ONE
22	Material	A516-70		
23	Thickness	18 (mm)	Corrosion Allowance	1.6 (mm)
24	Manway (Q'ty)	8 ASME 150# SO.RF	Size	20 (inch)
25	Water Inlet (Q'ty)	2 ASME 150# WN.FF	Size	32 (inch)
26	Water Outlet (Q'ty)	2 ASME 150# WN.FF	Size	32 (inch)
27	Drains (Q'ty)	2 ASME 150# WN.RF	Size	2 (inch)
28	Vents (Q'ty)	2 ASME 150# WN.RF	Size	1 (inch)
29	WaterBox Inside	RUBBER LINING (3T)	Anode Material	Fe Period (Year) 4
30	HOTWELL		Corrosion Allowance	0.8 (mm)
31	Holding Time (FROM BOTTOM TO N.W.L)	1.0 (Min.)	Capacity	2.83 (m <sup>3</sup> )
32	Condensate Outlet (Q'ty)	2	Size	14 (inch)
33	SHELL		Corrosion Allowance	0.8 (mm)
34	Thickness	18.0 (mm)	Material	A516-70
35	TUBE	Q'ty Material	O.D (mm) Th'k (mm)	Eff. Length (mm)
36	Condensing Zone	4124 B338-Gr2 (ERW)	25 0.5-Avg	6776
37	Air Cooling Zone	218 B338-Gr2 (ERW)	25 0.5-Avg	6776
38				
39	Impingement Plate	YES or No YES	Type	2 ROW OF IMPINGE RODS
40	TUBESHEET	Q'ty 2	Material	A516-70+B265-GR.1
41	TUBE SUPPORT	Q'ty 10	Material	A283-C
42	WEIGHT			
43	Empty		Operating	
44	71.0 (Ton)		106.0 (Ton)	Full Water 151.0 (Ton)
45	NOTE			
46	1. Design Code: HEI Code, ASME Sec.VIII Div.1 (without Stamp), Maker's standard			
47	2. Material Code: ASTM code			
48	3. Tubesheet: A516-70 + B265-GR.1 (3T Clad)			
49	4. Tube to tubesheet joint : Expanding with two(2) grooves + seal weld			
50				



# PERFORMANCE CURVE ( TM2156-A/B NGHISON-13 )



**INDRA**  
24-MAY-2015  
AS BUILT