


	<b>HAZOP Study Review For Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 1

# **Terms of Reference Issued for HAZOP Meeting**

## **HAZOP Study Review For Methanol Production Unit of MEKPC**



The intent of “Terms of Reference” is only preparing team members for HAZOP Meetings.  
The content of the document will be completed and elaborated in Final HAZOP Report.

**Prepared by  
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23 July 2022**

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 2



## Table of Contents

<b>1.</b>	<b>BRIEF HAZOP PROCEDURE.....</b>	<b>3</b>
1.1	STUDY METHOD .....	4
1.2.	USUAL DEVIATIONS USED IN HAZOP’S.....	7
1.3.	HAZOP ASSUMPTIONS .....	9
<b>2.</b>	<b>LIST OF DRAWINGS.....</b>	<b>12</b>
<b>3.</b>	<b>LIST OF NODES .....</b>	<b>18</b>
<b>4.</b>	<b>MARKED-UP P&amp;IDS .....</b>	<b>21</b>

	<b>HAZOP Study Review For Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 3

# 1

## Brief HAZOP Procedure

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 4

## 1.1. Study Method

The technique of Hazard and Operability studies, or in more common terms HAZOP, has been used and developed over approximately four decades for identifying potential hazards and operability problems caused by deviations from the design intent of both new and existing process plants. It is believed that HAZOP methodology is perhaps the most widely used aid to loss prevention.

Essentially, the HAZOP procedure involves taking a full description of a process and systematically questioning every part of it to establish how deviations from the design intent can arise. Once identified, an assessment is made as to whether such deviations and their consequences can have a negative effect upon the safe and efficient operation of the plant. If considered necessary, action is then recommended to be taken to remedy the situation.

This critical analysis is applied in a structured way by the HAZOP team, and it relies upon them releasing their imagination in an effort to discover credible causes of deviations.

In practice, many of the causes will be fairly obvious, such as pump failure causing a loss of circulation in a cooling water facility. However, the great advantage of the technique is that it encourages the team to consider other less obvious ways in which a deviation may occur, however unlikely they may seem at first consideration.



In this way, the study becomes much more than a mechanistic checklist-type review. The result is that there is a good chance that potential failures and problems will be identified, which had not previously been experienced in the type of plant being studied.

An essential feature in this process of questioning and systematic analysis is the use of guidewords and parameters to focus the attention of the team upon deviations and their possible causes. These are defined as follows:

**Guidewords**, which when combined with a parameter, suggest possible deviations.

**Parameters**, which focus attention upon a particular aspect of the design intent, an associated process condition or a parameter.

The entire technique of HAZOP revolves around the effective use of guidewords and parameters. So, their meaning and use must be clearly understood by the team.

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 5

Examples of often-used guidewords and parameters are listed below. These reflect both the process design intent and operating aspects of the plant being studied. Typical process-oriented words might be as follows.

**Table 1.** Process Parameters

Flow	Level
Pressure	Composition
Separation	Temperature
Reaction	Corrosion
Purity	Ph



The above list is purely illustrative, as the words employed in a review will depend upon the plant being studied. Added to the above might be relevant operating words such as:

Isolate	Drain	Start-up
Vent	Purge	Shutdown
Inspect	Maintain	

As mentioned above, certain guidewords are applied to the parameters to suggest potential deviations or problems. They tend to be a standard set, as listed below:

**Table 2.** HAZOP Guidewords

Guideword	Meaning
<b>No</b>	The design intent does not occur (e.g., Flow/No), or the operating aspect is not achievable (Isolate/No)
<b>Less</b>	A quantitative decrease in the design intent occurs (e.g., Pressure/Less)

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 6

<b>More</b>	A quantitative increase in the design intent occurs (e.g., Temperature/More)
<b>Reverse</b>	The opposite of the design intent occurs (e.g., Flow/Reverse)
<b>As well as</b>	The design intent is completely fulfilled, but in addition some other related activity occurs (e.g., Flow/As well as indicating contamination in a product stream)
<b>Other than</b>	The activity occurs, but not in the way intended (e.g., Flow/Other than could indicate a leak or product flowing where it should not, or Composition/Other than might suggest unexpected proportions in a feedstock)

In simple terms, the HAZOP study process involves applying in a systematic way all relevant deviations to the plant in question in an effort to uncover potential problems.

The deviations are applied to plants section by section to provide the necessary focus by limiting the scope of study to a certain part of the plant or unit in question each time. Each of these sections is called a ‘Node.’

The results of the study are recorded in tabular format under the following headings:

<b>Node:</b>			
<b>Deviation:</b>			
<b>Causes</b>	<b>Consequences</b>	<b>Safeguards</b>	<b>Recommendations</b>

A summarized description of these column headings follows:

**Deviations:**



The keyword combination being applied, e.g., No Flow. A list of usual deviations used in HAZOP studies is given in section 4.

**Causes:**

Potential causes that would result in the deviation occurring. There are some assumptions for causes:

Filters obstruction is not considered as a cause for No/Less Flow deviation.

For any deviations, it is supposed that bypass line of control valves is always open.

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 7

Failures in independent safety systems such as ESD and interlocks are not considered as causes.

Control valves and similar devices usually have known and assigned failure modes for power failure and/or instrument air failure. However, they may also fail mechanically, sometimes in the opposite direction of their known and designated failure modes.

**Consequences:**

The consequences that may arise from the effect of the deviation or if appropriate, from the cause itself.

**Safeguards:**

Any existing protective devices that either prevent the cause or safeguard against the adverse consequences would be recorded in this column. Safeguards need not be restricted to hardware. Where appropriate, credit can be taken for procedural aspects such as regular plant inspections.



**Recommendations:**

Where a credible cause results in a negative consequence, it must be decided whether some action should be taken. It is at this stage that consequences and associated safeguards are considered. If it is deemed that the protective measures are adequate, then no action need be taken, and words to that effect are recorded in the column.

**1.2. Usual Deviations Used in HAZOP's**

Deviations	Guide Word	Parameter
No/Less Flow	No/Less	Flow
More Flow	More	Flow
Reverse/Misdirected Flow	Reverse/Misdirected	Flow
Rupture	Other than	Flow
Leakage	As well as	Flow
High Temperature	High	Temperature
Low Temperature	Low	Temperature
High Discharge Pressure	High	Pressure
High Pressure	High	Pressure



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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 8

Deviations	Guide Word	Parameter
High Suction Pressure	High	Pressure
Low Pressure	Low	Pressure
Low Suction Pressure	Low	Pressure
High Level	High	Level
High/Excess Interface Level	High	Interface Level
High Interface Level	High	Interface Level
Low Interface Level	Low	Interface Level
Low/Reduced Interface Level	Low	Interface Level
High Bottoms Level	High	Level
Low Bottoms Level	Low	Level
Low Level	Low	Level
Low Tray Level	Low	Level
More/Excess Cooling	More	Cool
No/Less Cooling	Less	Cool
Corrosion Hazard	Other than	Corrosion
Fouling formation	Other than	Fouling
More/Excess Heating	More	Heat
More Fire/Explosion Risk	More	Heat
No/Less Heating	Less	Heat
High/Low heat value	High/Low	Heat Value
More Load on Structures	More	Load on Structures
More Load on Flare System	More	Load to Flare
Cavitations	As well as	Performance
Column Flooding/Foaming	Part of	Performance
Loss of Performance	Other than	Performance
High/Low pH	High/Low	pH
Extra phase/Phase missing	As well as/Part of	Phases
Impurities Present	As well as	Purity
Catalyst deactivated/inhibited	As well as	Purity

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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 9



Deviations	Guide Word	Parameter
High Reaction Rate	More	Reaction
Low Reaction Rate	Less	Reaction
Too much/Too fast Reaction	Other than	Reaction
Too little/Too slow Reaction	Other than	Reaction
Start-up/Shutdown hazards	Other than	Start-up/Shutdown
High Agitation/Recirculation	High	Agitation
Low Agitation/Recirculation	Low	Agitation
No/Less Component Separation	Less	Component Separation
Contaminants	As well as	Composition
Contaminants Enter Compressor	As well as	Composition
Contamination	As well as	Composition
High Concentration of Impurities	As well as	Composition
High Contaminants	As well as	Composition
Start-up/Shutdown Hazards	Other than	Start-up/Shutdown
Failure of service	Other than	Utility
High vibration	High	Vibration
Isolation Problem	Other than	Maintenance
Purging Problem	Other than	Maintenance
Evacuation Problem	Other than	Maintenance
Maintenance Hazards	Other than	Maintenance

### 1.3. HAZOP Assumptions



The following assumptions are usually taken into consideration during HAZOP studies. Following the usual practice of HAZOP studies and to the best of leader experience, these assumptions facilitate the study and help the team avoid unnecessary duplication of items to study, if applicable:

1. Plant will be operated at or below design rates.
2. The facility will be operated and maintained by qualified, experienced personnel using appropriate operating and maintenance procedures that will be written (or updated) to reflect current design prior to commissioning.



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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 10

3. Process chemistry is understood and plant model (heat & mass balance) are accurate.
4. Control valves are assumed to operate only in automatic rather than manual mode. Control valves that are operated manually, if any, are reviewed during the study and changing their operation mode from manual to automatic is discussed.
5. Control valves and similar devices usually have known and assigned failure modes for power failure and/or instrument air failure. However, they may also fail mechanically, sometimes in the opposite direction of their known and designated failure modes.
6. All drain and bleed valves are plugged or capped on their open ends. Thus, drains or vent valves will not normally be considered a potential hazard source except in special cases.
7. Simultaneous failure of several equipment items will not be considered. Actually, the probability of such a circumstance is usually very low.
8. Failure of a safeguard will not be considered as a cause of a deviation. The only exception is that when the team realizes the weaknesses of the design, in which case improvement options will be discussed and recorded.
9. In cases where the expression "same as above" appears under Consequences and safeguards column is empty, it means that all consequences of the previous cause (and only that cause) and related safeguards are valid for the case.
10. Whenever the same expression "same as above" is given in Consequences column but not in Safeguards column, any listed safeguards are assumed to be the only ones relevant to the case, although the consequences were the same.
11. Opening of PSV's or bleeding valves is a consequence of overpressure, so it will not be considered as a cause of 'Less Pressure' or 'Misdirected Flow'.
12. Incorrect set point will lead to consequences such as control system failure. So, it will not be considered as an independent cause.
13. Erroneous opening of two valves in series or valves with poor access is considered to be rare cases and will not be considered in the study.



	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 11

14. Error in opening of all lines and connections that are shown blank-off in P&ID's during normal operation will not be considered in the HAZOP study.
15. The inadvertent Opening/ Closing of a LC/LO/CSC/CSO valves will not be considered because administrative controls are considered adequate safeguard to prevent this situation.
16. Relief valves will not be blocked and removed from service during plant operations unless plant will be designed to allow servicing of relief devices while plant is operating.
17. In new plants where advanced control technologies are employed, enough safeguards are usually present in the form of automatic control systems, secondary safety barriers (like NRV's and PSV's), the ESD system itself, alarms and interlocks. So, local instruments will not generally be considered as safeguards, except for those cases where the operator has enough time to check without being exposed to high risk and the device is effective enough to show the deviation precisely.
18. Line rupture or major leak is not considered a cause of flow reduction, although actually they can. The reason is that possible fire or explosion as a result of such events is far more important than a simple low flow.
19. Wherever the expression "See relevant node" is used it means the reader of the document to refer to the corresponding node for detail causes, consequences and safeguards if applicable.

	<b>HAZOP Study Review For Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 12



# 2

## List of Drawings

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 13



Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-9000-PR-PID-001	Z01	Symbols and Identifications for Piping and Instrument Diagram (1)	
MKP-11-AS-9000-PR-PID-002	Z01	Symbols and Identifications for Piping and Instrument Diagram (2)	
MKP-11-AS-9000-PR-PID-003	Z01	Symbols and Identifications for Piping and Instrument Diagram (3)	
MKP-11-AS-1000-PR-PID-001	Z01	Gas Station	1
MKP-11-AS-1000-PR-PID-002	Z01	Natural Gas Distribution	1
MKP-11-AS-1000-PR-PID-003	Z01	Desulphurisation	2
MKP-11-AS-6000-PR-PID-001	Z01	Steam Condensate Return	3
MKP-11-AS-6000-PR-PID-002	Z01	NG Saturation I	3
MKP-11-AS-6000-PR-PID-003	Z01	NG Saturation II	3
MKP-11-AS-6000-PR-PID-004	Z01	NG Saturation III	3, 4
MKP-11-AS-2000-PR-PID-001	Z01	Process Oxygen	7
MKP-11-AS-2000-PR-PID-002	Z01	Oxygen Preheating	7
MKP-11-AS-2000-PR-PID-003	Z01	S/C Ratio Control I	5
MKP-11-AS-2000-PR-PID-004	Z01	S/C Ratio Control II	5
MKP-11-AS-2000-PR-PID-005	Z01	Flue Gas WHS I	9, 10
MKP-11-AS-2000-PR-PID-006	Z01	Flue Gas WHS II	2, 9, 11, 12
MKP-11-AS-2000-PR-PID-007	Z01	Flue Gas WHS III	2, 5, 6, 11
MKP-11-AS-2000-PR-PID-008	Z01	Prereforming	5
MKP-11-AS-2000-PR-PID-009	Z01	Tubular Reformer	6, 8, 9, 11
MKP-11-AS-2000-PR-PID-010	Z01	Secondary Reformer	7
MKP-11-AS-2000-PR-PID-011	Z01	Secondary Reformer II	13, 14
MKP-11-AS-2000-PR-PID-012	Z01	Steam Superheater	13, 14
MKP-11-AS-2000-PR-PID-013	Z01	Steam Generation	14
MKP-11-AS-2000-PR-PID-014	Z01	Gas Cooling and Separation I	13, 14
MKP-11-AS-2000-PR-PID-015	Z01	Gas Cooling and Separation II	17
MKP-11-AS-2000-PR-PID-016	Z01	Gas Cooling and Separation III	17
MKP-11-AS-2000-PR-PID-017	Z01	Fuel System	8
MKP-11-AS-2000-PR-PID-018	Z01	Start-Up Blower	18
MKP-11-AS-2000-PR-PID-019	Z01	H2 Recycle System	19
MKP-11-AS-2000-PR-PID-020	Z01	Air Cooler AE 2026 Detail	17
MKP-11-AS-3000-PR-PID-001	Z01	Synthesis Gas Compressor	
MKP-11-AS-3000-PR-PID-002	Z01	Synthesis Part I	
MKP-11-AS-3000-PR-PID-003	Z01	Methanol Synthesis	
MKP-11-AS-3000-PR-PID-004	Z01	Methanol R/E Exchanger	
MKP-11-AS-3000-PR-PID-005	Z01	Synthesis Gas Cooling	
MKP-11-AS-3000-PR-PID-006	Z01	Synthesis Part II	
MKP-11-AS-3000-PR-PID-007	Z01	Raw Product Flash	
MKP-11-AS-3000-PR-PID-008	Z01	Air Cooler AE 3002 Detail 1/2/3 Detail	
MKP-11-AS-3000-PR-PID-027	Z01	Synthesis Gas Compressor Package	
MKP-11-AS-3000-SF-PID-001	Z01	Sprinkler System in Unit 3000	
MKP-11-AS-4000-PR-PID-001	Z01	Methanol Tanks (1)	
MKP-11-AS-4000-PR-PID-002	Z01	Methanol Tanks (2)	
MKP-11-AS-4000-SF-PID-001	Z01	Foam System in Unit 4000	

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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 14



Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-4000-SF-PID-002	Z01	Sprinkler System in Unit 4000	
MKP-11-AS-4000-SF-PID-003	Z01	Sprinkler System for Pumps in Unit 4000	
MKP-11-AS-5000-PR-PID-001	Z01	Crude Methanol Tank	
MKP-11-AS-5000-PR-PID-002	Z01	Stabilizer Column	
MKP-11-AS-5000-PR-PID-003	Z01	Stabilizer Column Reboiler	
MKP-11-AS-5000-PR-PID-004	Z01	Stabilizer Column OH System	
MKP-11-AS-5000-PR-PID-005	Z01	Stabilizer Column Pumps	
MKP-11-AS-5000-PR-PID-006	Z01	LP Methanol Column	
MKP-11-AS-5000-PR-PID-007	Z01	LP Methanol Column Reboiler	
MKP-11-AS-5000-PR-PID-008	Z01	LP Methanol Column OH System	
MKP-11-AS-5000-PR-PID-009	Z01	MP Methanol Column Feed Pump	
MKP-11-AS-5000-PR-PID-010	Z01	MP Methanol Column	
MKP-11-AS-5000-PR-PID-011	Z01	MP Column Reboilers	
MKP-11-AS-5000-PR-PID-012	Z01	MP Methanol Column OH System	
MKP-11-AS-5000-PR-PID-013	Z01	MP Methanol Column by Product	
MKP-11-AS-5000-PR-PID-014	Z01	Methanol Product	
MKP-11-AS-5000-PR-PID-015	Z01	Methanol Product Buffer Tank I	
MKP-11-AS-5000-PR-PID-016	Z01	Methanol Product Buffer Tank II	
MKP-11-AS-5000-PR-PID-017	Z01	Liquid Off-Stream Tank	
MKP-11-AS-5000-PR-PID-018	Z01	Closed Drain Collection	
MKP-11-AS-5000-PR-PID-019	Z01	Slops Collection	
MKP-11-AS-5000-PR-PID-020	Z01	NaOH Dosing Unit X 5003 Utility Diagram	
MKP-11-DE-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 1	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 2	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 3	
MKP-11-AS-5000-PR-PID-023	Z01	Air Cooler AE 5005 Detail Part 4	
MKP-11-AS-5000-PR-PID-024	Z01	Air Cooler AE 5004 Detail	
MKP-11-AS-5000-PR-PID-026	Z01	Air Cooler AE 5006 Detail	
MKP-11-AS-5000-SF-PID-001	Z01	Foam System in Unit 5000	
MKP-11-AS-5000-SF-PID-002	Z01	Sprinkler System in Unit 5000	
MKP-11-AS-5000-SF-PID-002	Z01	Sprinkler System in Unit 5000	
MKP-11-AS-5000-SF-PID-003	Z01	Sprinkler System for Pumps in Unit 5003	
MKP-11-AS-5000-SF-PID-004	Z01	Sprinkler System for Pumps in Unit 5001	
MKP-11-AS-7000-PR-PID-006	Z01	HHP-HP Steam Control System	
MKP-11-AS-7000-PR-PID-007	Z01	HP Steam Export/ Import	
MKP-11-AS-7000-PR-PID-008	Z01	MP & LP Steam Control System	
MKP-11-AS-7000-PR-PID-009	Z01	LP Steam Control	
MKP-11-AS-7000-PR-PID-010	Z01	HHP & HP Steam Header	

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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 15

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-7000-PR-PID-011	Z01	LP Steam Header	
MKP-11-AS-7000-PR-PID-012	Z01	Deaerator	
MKP-11-AS-7000-PR-PID-013	Z01	BFW Pumps	
MKP-11-AS-7000-PR-PID-014	Z01	BFW Header	
MKP-11-AS-7000-PR-PID-015	Z01	Process Condensate Storage	
MKP-11-AS-7000-PR-PID-016	Z01	Cooling Water Header I Utility Diagram	
MKP-11-AS-7000-PR-PID-017	Z01	Nitrogen Header Utility Diagram	
MKP-11-AS-7000-PR-PID-018	Z01	Plant Air Header Utility Diagram	
MKP-11-AS-7000-PR-PID-019	Z01	Instrument Air Header Utility Diagram	
MKP-11-AS-7000-PR-PID-020	Z01	Demineralized Header Utility Diagram	
MKP-11-AS-7000-PR-PID-021	Z01	Service Water Header Utility Diagram	
MKP-11-AS-7000-PR-PID-022	Z01	Potable Water Header Utility Diagram	
MKP-11-AS-7000-PR-PID-023	Z01	Phosphate Dosing Unit-X 7001 Utility Diagram	
MKP-11-AS-7000-PR-PID-024	Z01	Amonia Dosing Unit-X 7002 Utility Diagram	
MKP-11-AS-7000-PR-PID-025	Z01	Oxygen Scav.Dosing Unit-X 7003 Utility Diagram	
MKP-11-AS-7000-PR-PID-026	Z01	Boiler Blow Down Utility Diagram	
MKP-11-AS-7000-PR-PID-027	Z01	Steam Condensate Recovery Unit	
MKP-11-AS-7000-PR-PID-028	Z01	P7001 A/B BFW Pump	
MKP-11-AS-7000-PR-PID-029	Z01	P7001 C BFW Pump	
MKP-11-AS-7000-PR-PID-030	Z01	Cooling Water Header II Utility Diagram	
MKP-11-AS-7000-PR-PID-031	Z01	Cooling Water Header III Utility Diagram	
MKP-11-AS-7000-PR-PID-032	Z01	Hose Station System I Utility Diagram	
MKP-11-AS-7000-PR-PID-033	Z01	Hose Station System II Utility Diagram	
MKP-11-AS-8000-PR-PID-001	Z01	Pipe Rack and Pipe Net System	
MKP-11-AS-8500-PR-PID-001	Z01	Utility Distribution Diagram Flare Header I	
MKP-11-AS-8500-PR-PID-002	Z01	Utility Distribution Diagram Flare Header II	
MKP-11-AS-8500-PR-PID-003	Z01	Flare K.O Drum	
MKP-11-AS-8500-PR-PID-004	Z01	Flare Stack I	
MKP-11-AS-8500-PR-PID-005	Z01	Flare Stack II	
MKP-11-AS-9400-PR-PID-002	Z01	POC	
MKP-11-AS-9400-PR-PID-003	Z01	Sanitary Wastewater	
MKP-11-AS-0201-SF-PID-001	Z01	Gas Fire Extinguishing System In Unit 0201	
MKP-11-AS-0202-SF-PID-001	Z01	Gas Fire Extinguishing System In Unit 0202	
MKP-11-AS-0300-SF-PID-001	Z01	Foam Station	
MKP-11-AS-0500-PR-PID-001	Z01	Cooling Water Tower	
MKP-11-AS-0500-PR-PID-002	Z01	Cooling Water Turbine Pump 1	
MKP-11-AS-0500-PR-PID-003	Z01	Cooling Water Turbine Pump 2	
MKP-11-AS-0500-PR-PID-004	Z01	Cooling Water Pump	



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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 16

Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-11-AS-0500-PR-PID-005	Z01	Cooling Water Filter	
MKP-11-AS-0500-PR-PID-006	Z01	Chemical Dosing Unit	
MKP-11-DE-7200-PR-PID-001	C1	Filter and Heat Exchanger	
MKP-11-DE-7200-PR-PID-002	C1	Mixed-Ion Exchanger	
MKP-11-DE-7200-PR-PID-003	C1	DMW Storage and Feeding	
MKP-11-DE-7200-PR-PID-004	C1	Acid and Alkali Regeneration	
MKP-11-DE-7200-PR-PID-005	C1	Neutralization	
MKP-VD-9000-301-002-A1-G (1 of 14)	G	Cover Sheet	
SOK0880159 (2 of 14)	6	Symbols and Legend	
SOK0880159 (3 of 14)	6	General Notes	
SOK0880159 (4 of 14)	6	Connection List	
SOK0880159 (5 of 14)	6	Lube Oil Console System	
SOK0880159 (6 of 14)	6	Lube Oil Machine System	
SOK0880159 (7 of 14)	6	Control Oil System	
SOK0880159 (8 of 14)	6	Steam System (Condensing)	
SOK0880159 (9 of 14)	6	Steam Condensing System	
SOK0880159 (10 of 14)	6	BCL606/N Seal Gas System	
SOK0880159 (11 of 14)	6	BCL606/N Seal Gas Treatment System	
SOK0880159 (12 of 14)	6	2BCL606/N Seal Gas System	
SOK0880159 (13 of 14)	6	2BCL606/N Seal Gas Treatment System	
SOK0880159 (14 of 14)	6	Casing Seals Monitoring System	
MKP-VD-9000-301-066-A1-0 (1 of 7)	0	Syngas & Recycle Gas Compression	
SOK0887013 (1 of 7)	5	Syngas & Recycle Gas	
SOK0887013 (2 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (3 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (4 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (5 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (6 of 7)	5	Syngas & Recycle Gas Compression	
SOK0887013 (7 of 7)	5	Syngas & Recycle Gas Compression	
MKP-VD-9000-308-049-A4-0	0	Dry Gas Seal System	
MKP-VD-9000-308-053-A4-0	0	Lube Oil System	
MKP-VD-9000-308-060-A4-0	0	Process Gas System	
MKP-VD-9000-306-003-A1	0	C 2002_H2 Recycle Compressor Purge Gas	
MKP-VD-9000-306-004-A1	0	C 2002_H2 Recycle Compressor Process Gas System	
MKP-VD-9000-306-005-A1	0	C 2002_H2 Recycle Compressor Cooling Water System	
MKP-VD-9000-306-006-A1	0	C 2002_H2 Recycle Compressor Unloading Control System	
MKP-VD-9000-306-007-A1	0	C 2002_H2 Recycle Compressor Lube Oil System	
MKP-VD-9000-303-150-A3	2	P7001AB_BFW_PUMP	



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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 17



Drawing	Rev.	Title	Place(s) Used [Nodes]
MKP-VD-9000-303-155-A3	2	P7001C_BFW_PUMP	
MKP-VD-9000-311-200-A3	2	P0502_1/2_CW_PUMP	
MKP-VD-9000-311-205-A3	1	P0502A/B_CW_PUMP	
MKP-VD-9000-302-120-A1 (1 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (2 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (3 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (4 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-120-A1 (5 of 5)	C	Turbine: 1155 Ce (FT-2002)	
MKP-VD-9000-302-145-A1 (1 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (2 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (3 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (4 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-145-A1 (5 of 5)	C	Turbine: 685 CeH (FT-2001)	
MKP-VD-9000-302-302-A0-B	B3	Fan (F-2001)	
MKP-VD-9000-302-302-A0-B	B3	Fan (F-2002)	

**Note:** This list would be completed during HAZOP. “Place(s) Used [Nodes]” column of table will be completed during HAZOP.

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 18



# 3

## List of Nodes

	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 19



Nodes	Note(s)	Node Color	Type	Equipment IDs	Drawings	
1. Natural Gas Station & Distribution		Yellow	Line	X-19011; D-1001;	MKP-11-AS-1000-PR-PID-002	
			Filter		MKP-11-AS-1000-PR-PID-001	
			Drum			
2. Hydrogenator & Sulphur Absorber		Red	Line	R-1001; R-1002 1/2; E-2004; E-2006;	MKP-11-AS-1000-PR-PID-003	
			Reactor		MKP-11-AS-2000-PR-PID-006	
			Heater		MKP-11-AS-2000-PR-PID-007	
3. NG Saturation		Green	Line	P-6002A; T-6001 1; X-6001A; X-6002A; D-6001; E-6001; P- 6001A; E-6004; E- 6002;	MKP-11-AS-6000-PR-PID-001	
			Saturator		MKP-11-AS-6000-PR-PID-002	
			Drum		MKP-11-AS-6000-PR-PID-003	
			Filter			
			Heat Exchanger		MKP-11-AS-6000-PR-PID-004	
			Centrifugal Pump			
4. Saturator Blow Down Drum		Orange	Line	D-6002; E-6003; P- 7003A;	MKP-11-AS-6000-PR-PID-004	
			Drum			
			Heat Exchanger			
			Centrifugal Pump			
5. Prereforming		Pink	Line	E-2002; R-2003;	MKP-11-AS-2000-PR-PID-003	
			Reactor		MKP-11-AS-2000-PR-PID-004	
			Heater		MKP-11-AS-2000-PR-PID-007	
6. Tubular Reformer		Orange	Line	E-2001; H-2001;	MKP-11-AS-2000-PR-PID-007	
			Reformer		MKP-11-AS-2000-PR-PID-009	
			Heater			
7. Secondary Reformer		Blue	Line	X-2001A; X-2002A; E-2008; D-2011; R- 2004;	MKP-11-AS-2000-PR-PID-001	
			Reformer		MKP-11-AS-2000-PR-PID-002	
			Heat Exchanger		MKP-11-AS-2000-PR-PID-010	
			Filter			
8. Fuel Gas System		Green	Line	X-2003;	MKP-11-AS-2000-PR-PID-009	
			Static Mixer		MKP-11-AS-2000-PR-PID-017	
9. Combustion Air		Blue	Line	F-2002; E-2007; H- 2001;	MKP-11-AS-2000-PR-PID-005	
			Blower		MKP-11-AS-2000-PR-PID-006	
			Heater		MKP-11-AS-2000-PR-PID-009	
10. Steam Turbine FT-2002		Orange	Line	FT-2002;	MKP-11-AS-2000-PR-PID-005	
			Turbine			
11. Flue Gas System		Violet	Blower	H-2001; E-2001; E- 2002; E-2004; E-2006; E-2007; F-2001; S- 2001;	MKP-11-AS-2000-PR-PID-006	
			Heater		MKP-11-AS-2000-PR-PID-007	
			Reformer		MKP-11-AS-2000-PR-PID-009	
			Stack			
12. Steam Turbine FT-2001		Green	Line	FT-2001;	MKP-11-AS-2000-PR-PID-006	
			Turbine			
13. Process Gas Cooling and 1st Separator		Yellow	Line	E-2020 1; E-2021 1&3; E-2022 1~3; D- 2002; P-2001A;	MKP-11-AS-2000-PR-PID-011	
			Heat Exchanger		MKP-11-AS-2000-PR-PID-012	
			Drum		MKP-11-AS-2000-PR-PID-014	
			Centrifugal Pump			
14. HHP Steam Production		Red	Line	E-2020 1; E-2021 1&3; D-2001; E-2022 1~3;	MKP-11-AS-2000-PR-PID-011	
			Drum		MKP-11-AS-2000-PR-PID-012	
			Heat Exchanger		MKP-11-AS-2000-PR-PID-013	
15. Process Gas Cooling and 2nd Separator		Pink	Line	D-2003; E-5023;	MKP-11-AS-2000-PR-PID-014	
			Drum			
			Heat Exchanger			

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	<b>HAZOP Study Review</b> <b>For</b> <b>Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 20

Nodes	Note(s)	Node Color	Type	Equipment IDs	Drawings
16. Process Gas Cooling and 3rd Separator		Violet	Line	D-2004; E-5024 1; P-2002A;	
			Drum		
			Heat Exchanger		
			Centrifugal Pump		
17. Process Gas Cooling and Final Separator		Orange	Line	D-2005; E-2025; E-2027; P-2003A; AE-2026;	MKP-11-AS-2000-PR-PID-015
			Drum		MKP-11-AS-2000-PR-PID-016
			Heat Exchanger		MKP-11-AS-2000-PR-PID-020
			Centrifugal Pump		
18. Start-up Nitrogen Compressor		Blue	Line Centrifugal Compressor	C-2001;	MKP-11-AS-2000-PR-PID-018
19. Hydrogen Recycle Compressor		Violet	Line Centrifugal Compressor	C-2002;	MKP-11-AS-2000-PR-PID-019

**Note:** This list and Marked-up P&IDs would be completed during HAZOP.

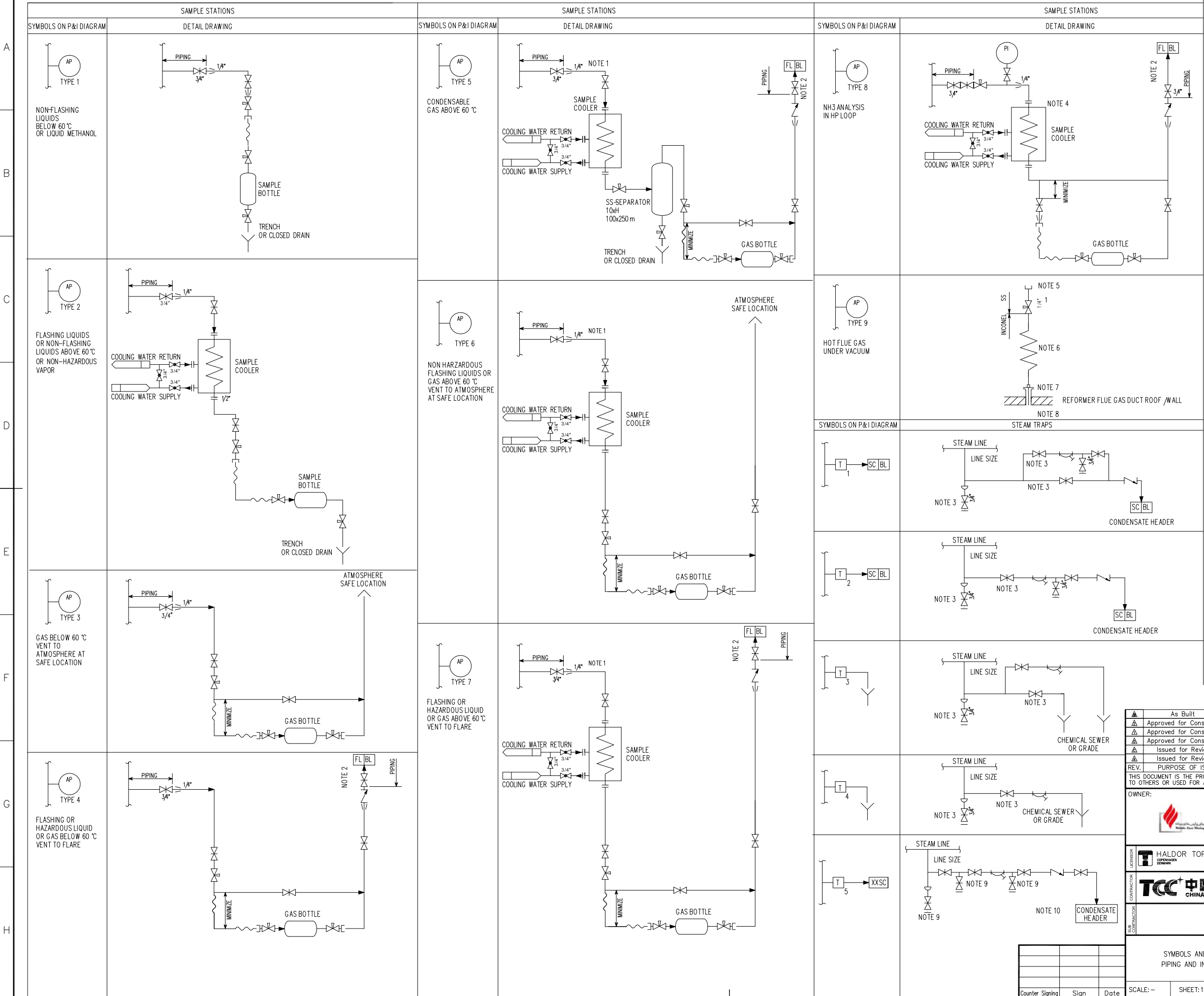
	<b>HAZOP Study Review For Methanol Production Unit of MEKPC</b>	
July 2022	<b>Terms of Reference</b>	Page: 21

# 4

## Marked-Up P&IDs

SYMBOLS FOR PROCESS AND INSTRUMENTATION		SYMBOLS FOR PIPING ELEMENTS		LETTER CODE FOR INSTRUMENTATION		LETTER CODE FOR PROCESS EQUIPMENT AND PIPING FITTINGS		IDENTIFICATION:		GENERAL NOTES:		LIST OF DIAGRAMS																																																																																																																																																																																																																																		
PIPES		LINE SYMBOLS		FIRST LETTER		PROCESS EQUIPMENT		PIPE NUMBER:		GENERAL NOTES:		DIAGRAM NUMBER	TITLE	DWG. NO.																																																																																																																																																																																																																																
<p><b>SYMBOLS FOR PROCESS AND INSTRUMENTATION</b></p> <p><b>PIPES</b></p> <p>MAIN PROCESS LINE</p> <p>OTHER LINE</p> <p>STEAM TRACING</p> <p>ELECTRIC TRACED</p> <p>TRACED-MEDIA UNSPECIFIED</p> <p>STEAM JACKETED</p> <p>SLOPE DOWN</p> <p>SLOPE UP</p> <p>FREE DRAINING</p> <p><b>INSTRUMENT LINES</b></p> <p>CONNECT TO PROCESS OR UNDEFINED SIGNAL</p> <p>PNEUMATIC SIGNAL</p> <p>ELECTRIC SIGNAL</p> <p>ELECTRIC BINARY SIGNAL</p> <p>CAPILLARY TUBE</p> <p>HYDRAULIC SIGNAL</p> <p>DATA LINE OR SOFTWARE</p> <p>MECHANICAL LINK</p> <p>BY VENDOR (B.V.)</p> <p>AUTOMATIC MANIFOLD</p> <p><b>INSTRUMENT OR FUNCTION</b></p> <p>INSTRUMENT SURROUNDED BY BOX IS PART OF DISTRIBUTED CONTROL SYSTEM / ESD SYSTEM</p> <p>FIELD MOUNTED</p> <p>BEHIND-PANEL DEVICE (NORM. INACCESSIBLE)</p> <p>AUXILIARY LOCATION (LOCAL PANEL)</p> <p>INTERLOCK FUNCTION (GROUP 1)</p> <p>ESD SYSTEM (GROUP 1)</p> <p>INTERLOCK LOGIC (GROUP 1)</p> <p>SWITCH</p> <p>INSTRUMENT WITH ELECTRIC TRACING</p> <p><b>TYPICAL EQUIPMENT SYMBOLS</b></p> <p>CENTRIFUGAL PUMP</p> <p>RECIPROCATING PUMP</p> <p>SUBMERGED PUMP</p> <p>AIR BLOWER</p> <p>VERTICAL PUMP</p> <p>MOTOR</p> <p>EJECTOR</p> <p>TURBINE</p> <p>ROOT'S COMPRESSOR</p> <p>CRANE</p>		<p><b>SYMBOLS FOR PIPING ELEMENTS</b></p> <p>GATE VALVE</p> <p>GLOBE VALVE</p> <p>NEEDLE VALVE</p> <p>BALL VALVE</p> <p>PLUG VALVE</p> <p>DIAPHRAGM VALVE</p> <p>BUTTERFLY VALVE</p> <p>HAND OPERATED CONTROL VALVE</p> <p>SOLENOID VALVE</p> <p>ELECTRIC MOTOR OPERATED VALVE</p> <p>SELF OPERATING BACK PRESSURE REGULATING VALVE</p> <p>SELF OPERATING PRESSURE REDUCING VALVE</p> <p>SPRING VALVE</p> <p>SPRING LOADED RELIEF VALVE</p> <p>SPRING LOADED QUICK CLOSING VALVE-INTERMITTENT BLOW DOWN</p> <p>SPRING LOADED SAFETY RELIEF VALVE</p> <p>SPRING LOADED VACUUM RELIEF VALVE</p> <p>BREATHING VALVE</p> <p>EMERGENCY RELIEF MANHOLE</p> <p>RUPTURE DISC</p> <p>ORIFICE</p> <p>VENTURI</p> <p>FLOW NOZZLE</p> <p>ROTAMETER</p> <p>TURBINE OR PROPELLER TYPE FLOW METER</p> <p>ANNUBAR TYPE FLOW ELEMENT</p> <p>AVERAGE PILOT TUBE OR ANNUBAR</p> <p>POSITIVE DIS-PLACEMENT METER</p> <p>VORTEX FLOWMETER</p> <p>ULTRASONIC FLOWMETER</p> <p>CORIOLIS FLOWMETER</p> <p>MAGNETIC FLOWMETER</p> <p>3-WAY SOLENOID VALVE: ARROW INDICATES STATE WHEN DE-ENERGIZED</p> <p>ELECTRO/PNEUMATIC CONVERTER</p> <p>DAMPER</p> <p>TEST POINT</p>		<p><b>LETTER CODE FOR INSTRUMENTATION</b></p> <p>MEASURED OR INITIATING VARIABLES</p> <p>ANALYSIS BURNER, COMBUSTION</p> <p>VOLTAGE (EMF)</p> <p>FLOW RATE</p> <p>HAND (MANUALLY INITIATED)</p> <p>CURRENT (ELECTRICAL)</p> <p>POWER</p> <p>TIME TIME SCHEDULE LEVEL</p> <p>MONITORING (MOTORS)</p> <p>PRESSURE, VACUUM QUANTITY</p> <p>RADIOACTIVITY</p> <p>SPEED, FREQUENCY</p> <p>TEMPERATURE</p> <p>MULTIVARIABLE VIBRATION</p> <p>WEIGHT, FORCE</p> <p>UNCLASSIFIED</p> <p>EVENT, STATE, PRESENCE</p> <p>POSITION, DIMENSION</p> <p>RUNNING</p> <p>STOP STATUS</p> <p>LOCAL/REMOTE</p> <p>CRANE, ELEVATOR</p> <p>READY FOR START</p> <p>STOP</p> <p>HST1 STOP</p> <p>LTM LOAD AND TEMPERATURE MANAGEMENT SYSTEM</p> <p>FF INSTRUMENT</p> <p>SUCCESSING LETTER</p> <p>MEASURED OR INITIATING VARIABLES</p> <p>ALARM</p> <p>CONTROL</p> <p>PRIMARY ELEMENT</p> <p>GLASS, GAUGE</p> <p>INDICATE</p> <p>CONTROL STATION</p> <p>LIGHT</p> <p>MANUAL INPUT</p> <p>ORIFICE (RESTRICTION)</p> <p>POINT (TEST CONN.)</p> <p>RECORD</p> <p>SWITCH</p> <p>TRANSMIT</p> <p>MULTIFUNCTION</p> <p>VALVE, DAMPER, LOUVER</p> <p>WELL</p> <p>UNCLASSIFIED</p> <p>RELAY, COMPUTE, CONVERT</p> <p>DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT</p> <p>ALARM</p> <p>ALARM ON DCS ARE IDENTIFIED BY PLACING INSTRUMENT DESIGNATION ADJACENT TO THE INSTRUMENT SYMBOLS i.e. :</p> <p>HIGH ALARM : UPPER RIGHT SIDE</p> <p>LOW ALARM : LOWER RIGHT SIDE</p> <p>TYPE OF LEVEL GAUGE:</p> <p>B = BICOLOR</p> <p>C = CONDUCTIVITY</p> <p>M = MAGNETIC</p> <p>R = REFLEX</p> <p>T = TRANSPARENT</p> <p>GENERAL NOTE:</p> <p>1. LETTER CODE FOR INSTRUMENTATION: IDENTIFICATION LETTERS ARE IN ACCORDANCE WITH ANSI-ISA-5.1</p> <p>2. ALL GAS AND STEAM FLOW MEASUREMENTS IN DCS ARE PRESSURE AND TEMPERATURE COMPENSATED</p>		<p><b>LETTER CODE FOR PROCESS EQUIPMENT AND PIPING FITTINGS</b></p> <p>PROCESS EQUIPMENT</p> <p>PROCESS FILTER</p> <p>COOLER, CONDENSER</p> <p>BLOWER, DRUM</p> <p>COMPRESSOR</p> <p>VESSEL, SEPARATOR</p> <p>HEAT EXCHANGER</p> <p>FAN</p> <p>TURBINE</p> <p>ALTERNATOR</p> <p>HEATER</p> <p>NOT TO BE USED</p> <p>EJECTOR</p> <p>ELECTRICAL EQUIPMENT</p> <p>ELECTRIC MOTOR (PREFIX TO K, P, W OR X)</p> <p>CONVEYER</p> <p>NOT TO BE USED</p> <p>PUMP</p> <p>AVAILABLE</p> <p>REACTOR, CONVERTER</p> <p>STACK, STRUCTURE</p> <p>COLUMN, TOWER</p> <p>TANK, STORAGE</p> <p>FOUNDATION</p> <p>FOUNDATION (PREFIX TO B, D, E, F, H, R, T ETC.)</p> <p>VENT, FLARE</p> <p>ELEVATOR</p> <p>MISCELLANEOUS EQUIPMENT</p> <p>INTERNAL (HARDWARE)</p> <p>INTERNAL (CATALYST)</p> <p>INTERNAL (CATALYST) (PREFIX TO R)</p> <p>MULTIFUNCTIONAL HYDRAULIC CONTROL VALVE</p> <p>POND</p> <p>RESIN TRAPPER</p> <p>FOR SUMP</p> <p>PIPING FITTINGS</p> <p>AUTOMATIC RECIRCULATION VALVE</p> <p>BLOW DOWN VALVE</p> <p>EMERGENCY RELIEF MANHOLE</p> <p>FLAME ARRESTOR/DEMISTER</p> <p>RESTRICTION ORIFICE</p> <p>FLEXIBLE CONNECTION</p> <p>SPRAY NOZZLE</p> <p>MINIMUM STOP VALVE</p> <p>MIXER</p> <p>OVER FLOW</p> <p>SAFETY RELIEF VALVES</p> <p>PRESSURE AND VACUUM RELIEF VALVE (BREATHING VALVE)</p> <p>RUPTURE DISC</p> <p>SAFETY SHOWER AND EYE WASHER</p> <p>SPECIAL PIPING ELEMENT</p> <p>STEAM TRAP</p> <p>STRAINER</p> <p>SIGHT GLASS</p> <p>HOSE</p> <p>DESIGNATION OF NOZZLES ON PROCESS EQUIPMENT</p> <p>INLET</p> <p>OUTLET</p> <p>DRAIN</p> <p>LEVEL SWITCH</p> <p>LEVEL GAUGE</p> <p>HANDHOLE</p> <p>LEVEL INSTRUMENT</p> <p>MANHOLE</p> <p>SAMPLE CONNECTION</p> <p>PRESSURE MEASUREMENT</p> <p>SAFETY VALVE</p> <p>TEMPERATURE MEASUREMENT</p> <p>UTILITY</p> <p>VENT</p>		<p><b>IDENTIFICATION:</b></p> <p>PIPE NUMBER:</p> <p>12"SG-50-101-B23-H1</p> <p>INSULATION CLASS</p> <p>INSULATION PURPOSE</p> <p>PIPE CLASS CODE</p> <p>SEQUENCE NUMBER</p> <p>UNIT NUMBER</p> <p>FLUID CODE</p> <p>NOMINAL DIAMETER</p> <p>EQUIPMENT NUMBER:</p> <p>R 5001 1/2 or A/B</p> <p>MAIN STAND BY</p> <p>FIRST OF TWO PARTS</p> <p>SERIAL NUMBER</p> <p>UNIT NUMBER</p> <p>EQUIPMENT GROUP LETTER</p> <p>FUNCTIONAL IDENTIFICATION</p> <p>FLUID CODES:</p> <p>AM AMMONIA WATER</p> <p>BD BOILER BLOW DOWN</p> <p>BFW BOILER FEED WATER</p> <p>BW WARM UP WATER</p> <p>CBD CONTINUOUS BLOW DOWN</p> <p>CD CLOSED DRAIN</p> <p>CH1 CORROSION INHIBITOR SOLUTION</p> <p>CH2 ANTISCALE SOLUTION</p> <p>CLO Co(OH)2 SOLUTION</p> <p>CS CAUSTIC SOLUTION</p> <p>CSW CLEAN SALTY WATER</p> <p>CWR COOLING WATER RETURN</p> <p>CWS COOLING WATER SUPPLY</p> <p>DR DRAIN</p> <p>DMW DEMINERALIZED WATER</p> <p>FF FOAM SOLUTION</p> <p>FG FUEL GAS</p> <p>FLG FLARE VENT GAS</p> <p>FW FIRE FIGHTING WATER</p> <p>HG HYDROGEN GAS</p> <p>HHP HIGH HIGH PRESSURE STEAM CONDENSATE</p> <p>HHS HIGH HIGH PRESSURE STEAM</p> <p>HPC HIGH PRESSURE CONDENSATE</p> <p>HPS HIGH PRESSURE STEAM</p> <p>HZ OXYGEN SCAVENGER</p> <p>IA INSTRUMENT AIR</p> <p>LO LUBRICANT OIL</p> <p>LOS LIQUID OFF STREAM METHANOL</p> <p>LPC LOW PRESSURE STEAM CONDENSATE</p> <p>LPV LOW PRESSURE STEAM</p> <p>MC CONDENSATE LIQUID</p> <p>METHANOL</p> <p>MP MEDIUM PRESSURE STEAM CONDENSATE</p> <p>MPS MEDIUM PRESSURE STEAM</p> <p>N NITROGEN</p> <p>NG NATURAL GAS</p> <p>NS NaOH SOLUTION</p> <p>OW OILY WATER</p> <p>PA PROCESS AIR</p> <p>PH OFF GAS</p> <p>PMC PHOSPHATE SOLUTION</p> <p>PMP CRUDE METHANOL</p> <p>PMV RICH METHANOL LIQUID</p> <p>PO RICH METHANOL GAS</p> <p>PW METHANOL WATER</p> <p>POC PROCESS OXYGEN</p> <p>PRC POTENTIALLY OILY CONTAMINATE WATER</p> <p>PRG PROCESS CONDENSATE</p> <p>PW POTABLE WATER</p> <p>RD RO WATER</p> <p>RFG REFORMED GAS</p> <p>SG SYNTHESIS GAS</p> <p>SN SANITARY SEWAGE</p> <p>SU H2SO4 SOLUTION (98%)</p> <p>SW SERVICE WATER</p> <p>VA TURBINE CONDENSATE</p> <p>VE VENT TO ATMOSPHERE</p> <p>VG VENT EXTRACTION</p> <p>VENT GAS</p>		<p><b>GENERAL NOTES:</b></p> <p>1) LOOP TAG NUMBERING EG. FHS, FHIC.</p> <p>F = LOOP DESIGNATION</p> <p>H = HAND</p> <p>S = SWITCH</p> <p>I = INDICATING</p> <p>C = CONTROLLER</p> <p>2) AUTOSTART:</p> <p>FAILURE OF RUNNING PUMP TO START STANDBY PUMP.</p> <p><b>IDENTIFICATION:</b></p> <p>VALVE STATE</p> <p>CSC CAR SEALED CLOSED</p> <p>CSO CAR SEALED OPEN</p> <p>FO FAILURE OPEN</p> <p>FCO FAILURE CLOSED</p> <p>FL FAILURE LOCKED</p> <p>FLO FAILURE LOCKED OPEN</p> <p>FLC FAILURE LOCKED CLOSED</p> <p>LO LOCKED OPEN</p> <p>LC LOCKED CLOSED</p> <p>NO NORMALLY OPEN</p> <p>NC NORMALLY CLOSED</p> <p>INSULATION CODES:</p> <p>C COLD INSULATED</p> <p>H HOT INSULATED</p> <p>N NOT INSULATED</p> <p>P PERSONNEL PROTECTION INSULATED</p> <p>HEAT TRACING CODES:</p> <p>ET ELECTRIC TRACED</p> <p>ST STEAM TRACED</p> <p>SJ STEAM JACKETED</p> <p>TR TRACED-MEDIA UNSPECIFIED</p> <p>PIPE CLASS CODES:</p> <p>FIRST LETTER INDICATES FLANGE RATING:</p> <p>B = class 150</p> <p>D = class 300</p> <p>F = class 600</p> <p>G = class 900</p> <p>H = class 1500</p> <p>J = class 2500</p> <p>NUMBER</p> <p>24 = CS</p> <p>34 = P11</p> <p>36 = P22</p> <p>40 = SS304L</p> <p>42 = SS316L</p> <p>44 = SS321</p> <p>50 = SS304</p> <p>64 = SS321H</p> <p>66 = SS347H</p> <p>70 = MNL</p> <p>MISCELLANEOUS:</p> <p>CIA = CS class 150 RF</p> <p>GIA = CS / GALV class 150 RF</p> <p>GIB = CS / GALV class 150 RF</p> <p>LIA = CS / PVC LINED class 150 RF</p> <p>NOA = PVC-U GRAVITY FLOW</p> <p>NOC = PE GRAVITY FLOW</p> <p>NZA = GRP class 150 RF</p> <p>NZB = HDPE class 150 RF</p> <p>NZC = PVC-C FN16 FF</p> <p>NZD = PP-R FN16 FF</p> <p>UIA = CS PTFE COATED class 150 RF</p> <p>B24U = As Built</p> <p>B24 FOR UNDERGROUND</p>		<p><b>LIST OF DIAGRAMS</b></p> <table border="1"> <thead> <tr> <th>DIAGRAM NUMBER</th> <th>TITLE</th> <th>DWG. 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P32	STABILIZER COLUMN OH SYSTEM	1341742																																																																																																																																																																																																																																												
P33	STABILIZER COLUMN PUMPS	1341743																																																																																																																																																																																																																																												
P34	LP METHANOL COLUMN	1341744																																																																																																																																																																																																																																												
P35	LP METHANOL COLUMN REBOILER	1341745																																																																																																																																																																																																																																												
P36	LP METHANOL COLUMN OH SYSTEM	1341746																																																																																																																																																																																																																																												
P37	MP METHANOL COLUMN FEED PUMP	1341747																																																																																																																																																																																																																																												
P38	MP METHANOL COLUMN	1341748																																																																																																																																																																																																																																												
P39	MP COLUMN REBOILERS	1341749																																																																																																																																																																																																																																												
P40	MP METHANOL COLUMN OH SYSTEM	1341750																																																																																																																																																																																																																																												
P41	MP METHANOL COLUMN BY PRODUCT	1341751																																																																																																																																																																																																																																												
P42	METHANOL PRODUCT	1341752																																																																																																																																																																																																																																												
P43	METHANOL PRODUCT BUFFER TANK I	1341753																																																																																																																																																																																																																																												
P44	METHANOL PRODUCT BUFFER TANK II	1341754																																																																																																																																																																																																																																												
P45	LIQUID OFF-STREAM TANK	1341755																																																																																																																																																																																																																																												
U01	FUEL SYSTEM	1341757																																																																																																																																																																																																																																												
U02	START-UP BLOWER	1341758																																																																																																																																																																																																																																												
U03	HHP-HP CONTROL STEAM	1341759																																																																																																																																																																																																																																												
U04	HP STEAM EXPORT IMPORT	1341760																																																																																																																																																																																																																																												
U05	MP AND LP STEAM CONTROL	1341761																																																																																																																																																																																																																																												
U06	LP STEAM CONTROL	1341762																																																																																																																																																																																																																																												
U07	HHP AND HP STEAM HEADER	1341763																																																																																																																																																																																																																																												
U08	LP STEAM HEADER	1341764																																																																																																																																																																																																																																												
U09	DEAERATOR	1341765																																																																																																																																																																																																																																												
U10	BFW PUMPS	1341766																																																																																																																																																																																																																																												
U11	BFW HEADER	1341767																																																																																																																																																																																																																																												
U12	PHOSPHATE DOSING UNIT-X 7001	1341768																																																																																																																																																																																																																																												
U13	AMINE DOSING UNIT-X 7002	1341769																																																																																																																																																																																																																																												
U14	OXYGEN SCAV. DOSING UNIT-X 7003	1341770																																																																																																																																																																																																																																												
U15	MORPHOLINE DOSING UNIT	1341771																																																																																																																																																																																																																																												
U16	BOILER BLOW DOWN	1341772																																																																																																																																																																																																																																												
U17	H2 RECYCLE SYSTEM	1341773																																																																																																																																																																																																																																												
U18	DEMINERALIZED WATER STORAGE	1341774																																																																																																																																																																																																																																												
U19	FLARE HEADER I	1341775																																																																																																																																																																																																																																												
U20	FLARE HEADER II	1341776																																																																																																																																																																																																																																												
U21	FLARE STACK	1341777																																																																																																																																																																																																																																												
U22	PROCESS CONDENSATE STORAGE	1353319																																																																																																																																																																																																																																												
U23A	ION EXCHANGE UNIT (OPTIONAL)	1353320																																																																																																																																																																																																																																												
U23B	ION EXCHANGE UNIT (OPTIONAL)	1353321																																																																																																																																																																																																																																												
U24	N-OIL DOSING UNIT X 5003	1353322																																																																																																																																																																																																																																												
U25	LIQUID OFF-STREAM STRIPPER	1354612																																																																																																																																																																																																																																												

VARIOUS SYMBOLS



- NOTES:**
- 1) MINIMUM 4m BARE TUBE FOR AIR COOLING BEFORE ENTERING WATER COOLER.
  - 2) VALVE TO FLARE TO BE IN ACCORDANCE WITH PROCESS PIPE CLASS.
  - 3) VALVES TO BE DOUBLED IN HIGH PRESSURE SYSTEMS.
  - 4) SAMPLE COOLER TO BE OMITTED IF TEMPERATURE <math>< 60^{\circ}\text{C}</math>.
  - 5) CONNECTION TO SUIT PORTABLE SAMPLE BOTTLE WITH VACUUM PUMP OR PORTABLE ANALYSER.
  - 6) MIN 4m OF BARE 1/4" INCONEL TUBE.
  - 7) CONAX FITTING WITH LAVA SEAL.
  - 8) TUBE INSERTED CLOSE TO EDGE OF BRICK WORK.
  - 9) THE PRINCIPLE FOR DRAIN VALVES AS FOLLOWS:
    - A. USING ONE SHUT-OFF VALVE AND THREADED PIPE CAP IF PIPE CLASS LESS THAN CLASS 600.
    - B. USING TWO SHUT-OFF VALVES AND BLIND FLANGE IF PIPE CLASS EQUAL OR MORE THAN CLASS 600, BUT LESS THAN CLASS 1500.
    - C. USING TWO WELDING SHUT-OFF VALVES AND ONE SHORT PIPE IN THE END IF PIPE CLASS EQUAL CLASS 1500.
  - 10) THE PRINCIPLE FOR STEAM CONDENSATE HEADER AS FOLLOWS:
    - A. FOR HHPs STEAM PIPE, CONDENSATE HEADER HHPSC.
    - B. FOR HPS AND MPS STEAM PIPE, CONDENSATE HEADER HPSC.
    - C. FOR LPS STEAM PIPE, CONDENSATE HEADER LPS.
- GENERAL NOTES:**
- 1) REQUIREMENTS FOR TRACING TO BE CONSIDERED.
  - 2) ALL SAMPLE CONNECTIONS SHALL BE FROM TOP OF PROCESS PIPE.
  - 3) ALL SAMPLE TUBING TO BE 1/4" SS.

As Built	30.04.2020	Xu Yekun		Xu Hang	Liu Shengkai		
Approved for Construction	06.11.2017	Xu Yekun		Xu Hang	Liu Shengkai		
Approved for Construction	22.03.2017	Xu Yekun		Xu Hang	Liu Shengkai		
Approved for Construction	22.01.2017	Xu Yekun		Xu Hang	Liu Shengkai		
Issued for Review	10.10.2016	Jiang Yu		Xu Hang	Liu Shengkai		
Issued for Review	25.06.2016	Jiang Yu		Xu Hang	Liu Shengkai		
REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE

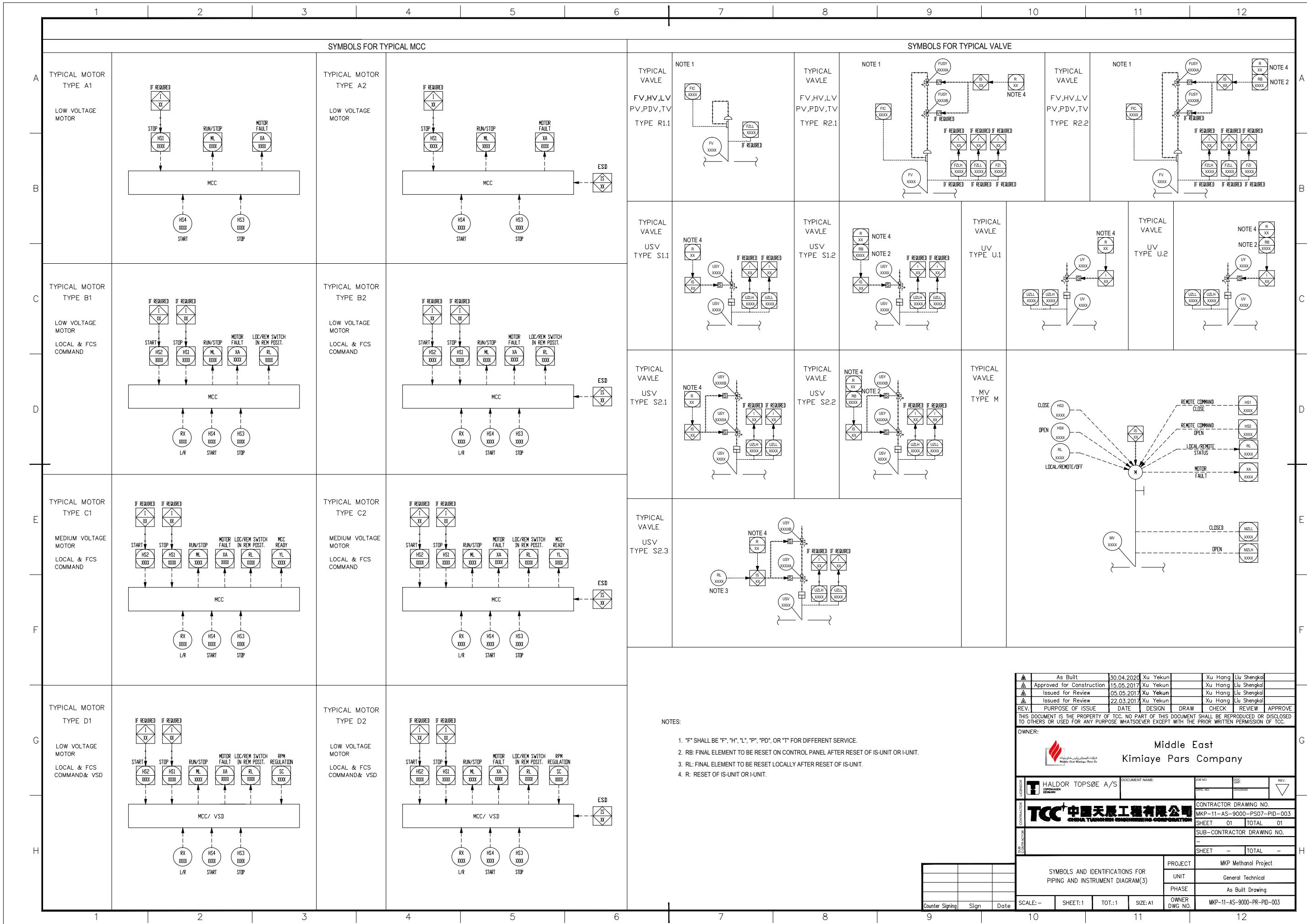
OWNER: Middle East Kimiaye Pars Company

HALDOR TOPSØE A/S

CONTRACTOR: TCC 中國天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION

CONTRACTOR DRAWING NO.	MKP-11-AS-9000-PS07-PID-002
SHEET	01 TOTAL 01
SUB-CONTRACTOR DRAWING NO.	
SHEET	TOTAL

PROJECT: MKP Methanol Project  
 UNIT: General Technical  
 PHASE: As Built Drawing  
 OWNER DWG NO: MKP-11-AS-9000-PR-PID-002

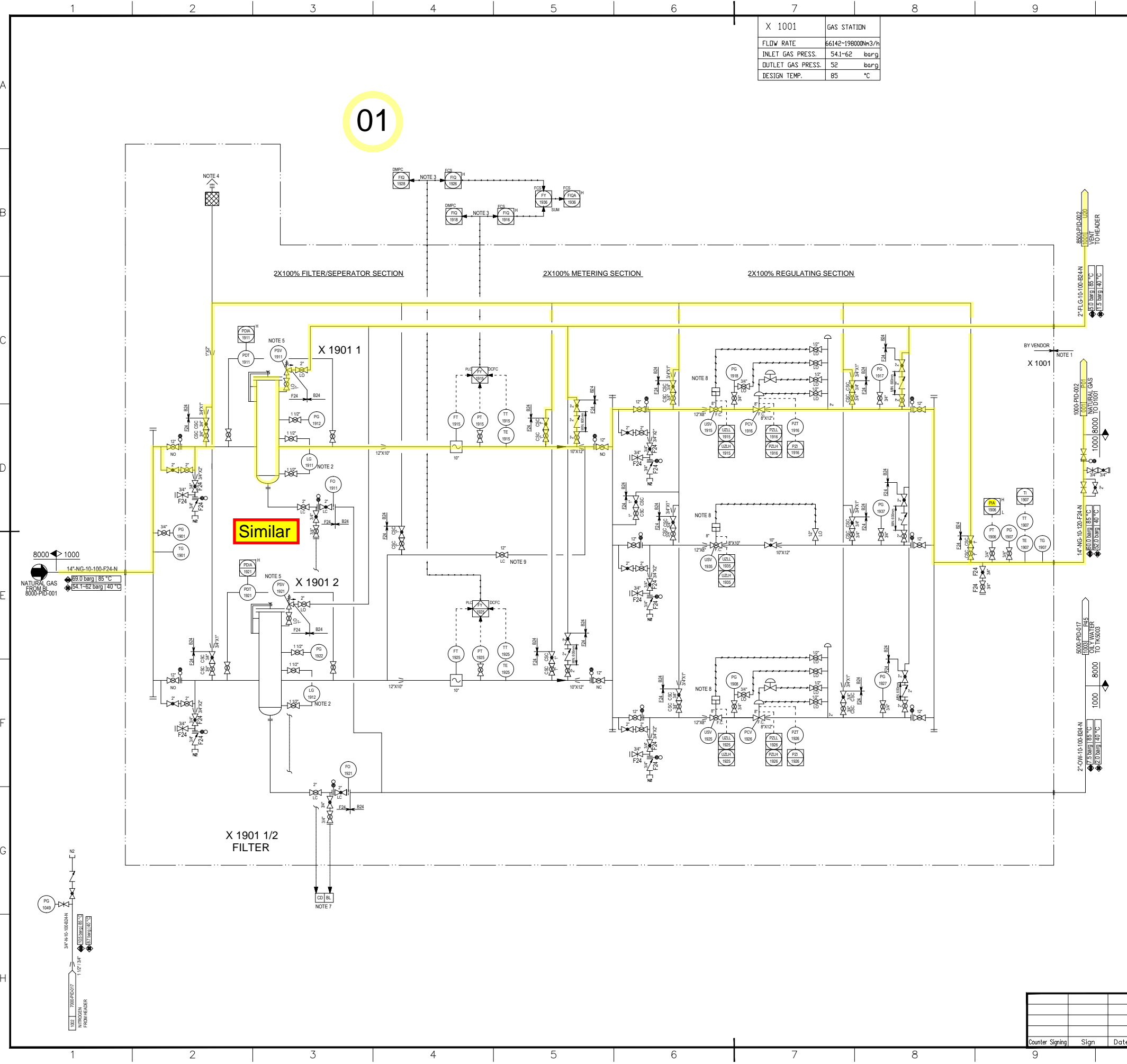


As Built	30.04.2020	Xu Yekun	Xu Hong	Liu Shengkol			
Approved for Construction	15.05.2017	Xu Yekun	Xu Hong	Liu Shengkol			
Issued for Review	05.05.2017	Xu Yekun	Xu Hong	Liu Shengkol			
Issued for Review	22.03.2017	Xu Yekun	Xu Hong	Liu Shengkol			
REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
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OWNER: Middle East Kimiaye Pars Company							
HALDOR TOPSØE A/S		DOCUMENT NAME:		DATE:	SCALE:	REV:	
TCC 中国天辰工程有限公司		CONTRACTOR DRAWING NO.		SHEET 01 TOTAL 01		SUB-CONTRACTOR DRAWING NO.	
		SHEET -- TOTAL --					
SYMBOLS AND IDENTIFICATIONS FOR PIPING AND INSTRUMENT DIAGRAM(3)				PROJECT: MKP Methanol Project		UNIT: General Technical	
				PHASE: As Built Drawing		OWNER DWG NO. MKP-11-AS-9000-PR-PID-003	
Counter	Sign	Date	SHEET: 1	TOT: 1	SIZE: A1		



X 1001	GAS STATION
FLOW RATE	66142-198000m <sup>3</sup> /h
INLET GAS PRESS.	54.1-62 barg
OUTLET GAS PRESS.	52 barg
DESIGN TEMP.	85 °C

01



GENERAL NOTES

- NOTES:
- 1) DETAILS OF X1001 TO BE UPDATED ACCORDING TO TECHNICAL DOCUMENTS PROVIDED BY VENDOR.
  - 2) THE LEVEL GAUGE SHOULD BE VISIBLE TO THE OPERATOR AT POSITION OF DRAIN VALVES.
  - 3) FIC CALCULATED INSIDE DUAL CHANNEL FLOW COMPUTER. ONE SIGNAL SENT TO DMP, AND ANOTHER SENT TO FCS. DCFC: DUAL CHANNEL FLOW COMPUTER.
  - 4) VENT TO SAFE AREA.
  - 5) REQUIREMENT OF PSV ON DRY GAS FILTER TO BE CONFIRMED BY VENDOR.
  - 6) VENT AND DRAIN TO BE FORESEEN GENERALLY AT HIGH AND LOW POINTS.
  - 7) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.
  - 8) TIGHT SHUT OFF TYPE(TSO), SLAM SHUT-OFF VALVE.
  - 9) DOUBLE LOCKED BY DMP AND OWNER.
  - 10) THE HIGH ALARMS FOR FIC-1915/1925/1935 ARE FOR REAL TIME FLOW RATE, NOT FOR ACCUMULATED VALUE.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	30.12.2019	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	02.02.2018	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	06.11.2017	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	22.03.2017	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	16.01.2017	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	11.11.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Issued for Approval	13.10.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Issued for Approval	24.06.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Issued for Comments	29.4.2016	Jiang Yu		Xu Hong	Liu Shengkol	

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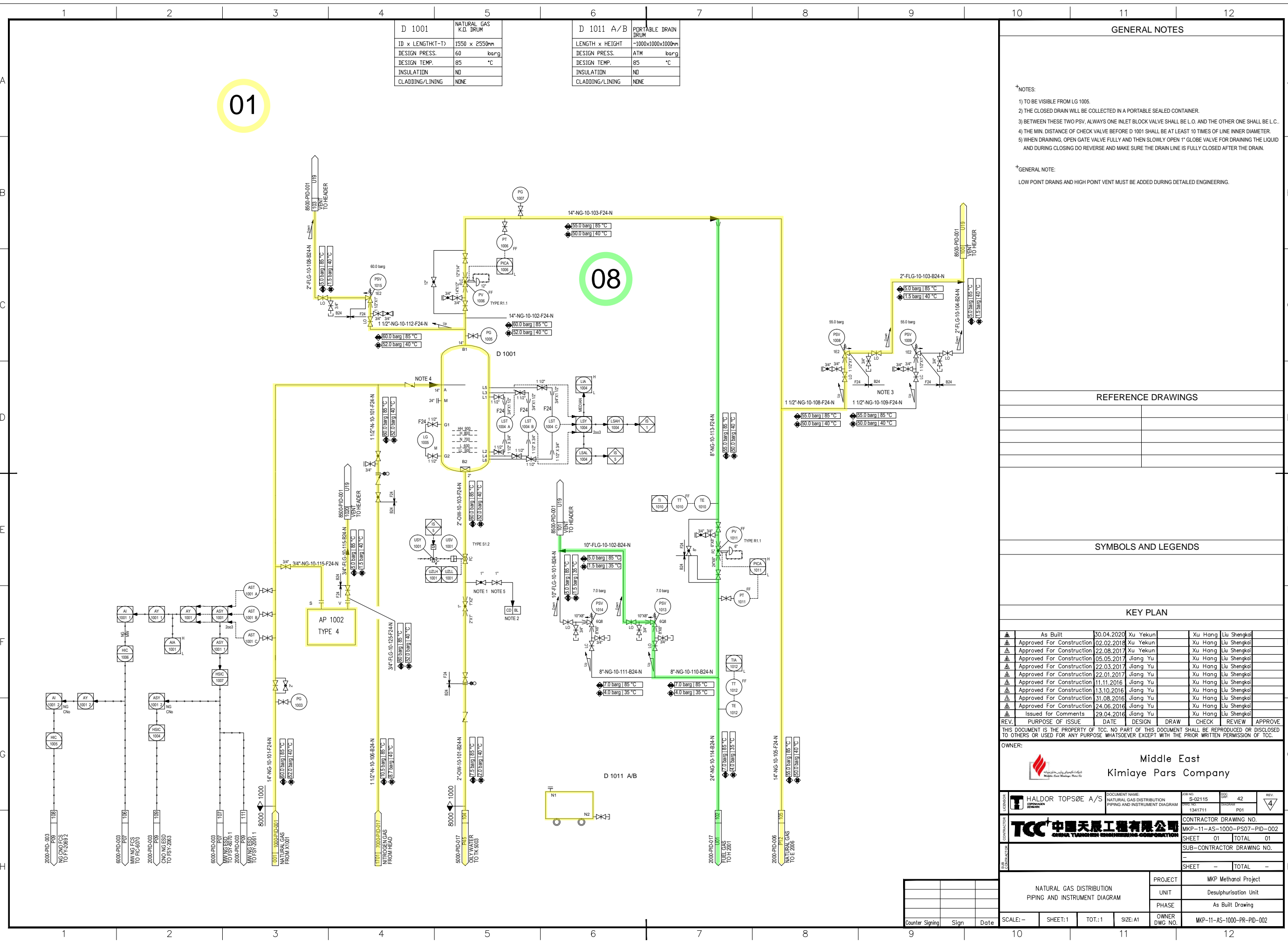
OWNER: Middle East Kimiaye Pars Company

CONTRACTOR: HALDOR TOPSØE A/S

CONTRACTOR: TCC 中国天辰工程有限公司  
CHINA TIANCHEN ENGINEERING CORPORATION

PROJECT	MKP Methanol Project
UNIT	Desulphurisation Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-1000-PR-PID-001

SCALE: -	SHEET: 1	TOT.: 1	SIZE: A1
Counter Signing	Sign	Date	



D 1001	NATURAL GAS K.D. DRUM
ID x LENGTH(T-D)	1550 x 2550mm
DESIGN PRESS.	60 barg
DESIGN TEMP.	85 °C
INSULATION	NO
CLADDING/LINING	NONE

D 1011 A/B	PORTABLE DRAIN DRUM
LENGTH x HEIGHT	~1000x1000x1000mm
DESIGN PRESS.	ATM barg
DESIGN TEMP.	85 °C
INSULATION	NO
CLADDING/LINING	NONE

01

08

GENERAL NOTES

- \*NOTES:
- 1) TO BE VISIBLE FROM LG 1005.
  - 2) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.
  - 3) BETWEEN THESE TWO PSV, ALWAYS ONE INLET BLOCK VALVE SHALL BE L.O. AND THE OTHER ONE SHALL BE L.C.
  - 4) THE MIN. DISTANCE OF CHECK VALVE BEFORE D 1001 SHALL BE AT LEAST 10 TIMES OF LINE INNER DIAMETER.
  - 5) WHEN DRAINING, OPEN GATE VALVE FULLY AND THEN SLOWLY OPEN 1" GLOBE VALVE FOR DRAINING THE LIQUID AND DURING CLOSING DO REVERSE AND MAKE SURE THE DRAIN LINE IS FULLY CLOSED AFTER THE DRAIN.
- \*GENERAL NOTE:
- LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	02.02.2018	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	22.08.2017	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved For Construction	05.05.2017	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	22.03.2017	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	22.01.2017	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	11.11.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	13.10.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	31.08.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Approved For Construction	24.06.2016	Jiang Yu		Xu Hong	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Jiang Yu		Xu Hong	Liu Shengkol	

OWNER: Middle East Kimiaye Pars Company

	DOCUMENT NAME	REV.
	NATURAL GAS DISTRIBUTION PIPING AND INSTRUMENT DIAGRAM	42
	CONTRACTOR DRAWING NO.	REV.
	MKP-11-AS-1000-PS07-PID-002	4
	SUB-CONTRACTOR DRAWING NO.	
	SHEET 01 TOTAL 01	

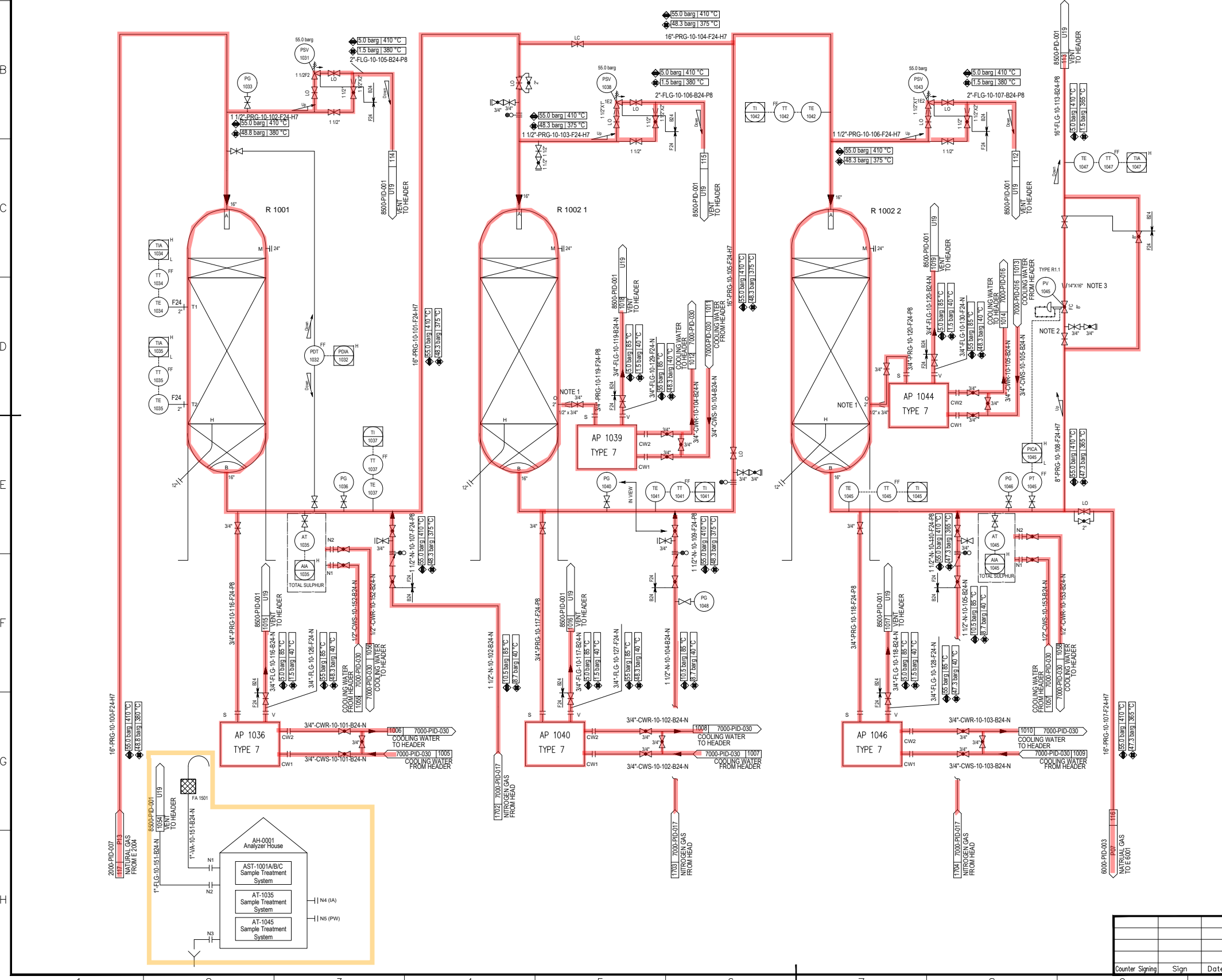
NATURAL GAS DISTRIBUTION PIPING AND INSTRUMENT DIAGRAM		PROJECT	MKP Methanol Project
		UNIT	Desulphurisation Unit
		PHASE	As Built Drawing
		OWNER DWG NO.	MKP-11-AS-1000-PR-PID-002

Counter	Sign	Date

R 1001	HYDROGENATOR
ID x LENGTH(T-D)	4450x3100 mm
DESIGN PRESS.	55 barg
DESIGN TEMP.	410 °C
INSULATION	YES
CLADDING/LINING	NDNE

R 1002 1/2	SULPHUR ABSORBER
ID x LENGTH(T-D)	4000x1500 mm
DESIGN PRESS.	55 barg
DESIGN TEMP.	410 °C
INSULATION	YES
CLADDING/LINING	NDNE

02



GENERAL NOTES

- NOTES:
- 1) NOZZLE O OF R 1002 1/2 IS AN INNER EXTENSION TUBE, CONNECTING PIPE OF AP 1039/1044 WITH 1/2" FLANGE, WHICH IS MORE RELIABLE THAN NPT CONNECTION.
  - 2) SOFTWARE LIMITATION FOR CHANGING SET POINT VALUE MUST NOT BE MORE THAN 5%.
  - 3) PV-1045 INCLUDES 4 NOISE REDUCTION DISKS, THE SIZE IS 8"-10"-12"-14", AND THE REDUCER CONSIDERED BY PIPING.
- GENERAL NOTE:
- 1) LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS


SYMBOLS AND LEGENDS


KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun	Xu Hong	Liu Shengke		
▲	Approved For Construction	06.11.2017	Xu Yekun	Xu Hong	Liu Shengke		
▲	Approved For Construction	05.05.2017	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	22.03.2017	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	22.01.2017	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	11.11.2016	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	13.10.2016	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	31.08.2016	Jiang Yu	Xu Hong	Liu Shengke		
▲	Approved For Construction	24.06.2016	Jiang Yu	Xu Hong	Liu Shengke		
▲	Issued for Comments	29.04.2016	Jiang Yu	Xu Hong	Liu Shengke		

OWNER: Middle East Kimiaye Pars Company

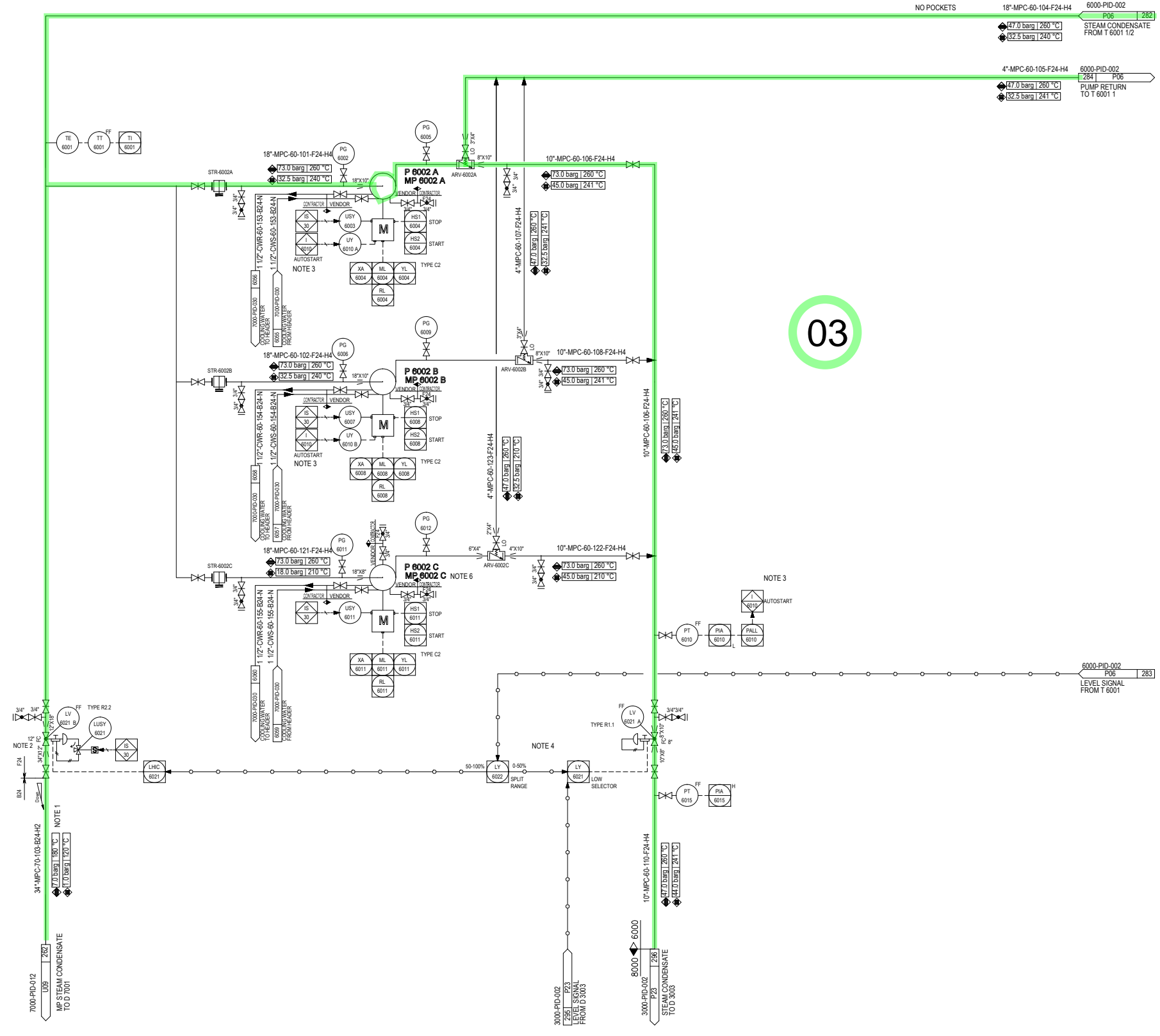
CONTRACTOR: HALDOR TOPSØE A/S	DOCUMENT NAME: DESULPHURISATION PIPING AND INSTRUMENT DIAGRAM	PROJ NO: S-02115	DATE: 42	REV: 5
CONTRACTOR: TCC 中国天辰工程有限公司		CONTRACTOR DRAWING NO. MKP-11-AS-1000-PS07-PID-003		
SUB-CONTRACTOR DRAWING NO.		SHEET 01 TOTAL 01		
SHEET -- TOTAL --		SHEET -- TOTAL --		

PROJECT: MKP Methanol Project	UNIT: Desulphurisation Unit
PHASE: As Built Drawing	OWNER DWG NO. MKP-11-AS-1000-PR-PID-003

1 2 3 4 5 6 7 8 9 10 11 12

A  
B  
C  
D  
E  
F  
G  
H

P 6002 A/B		STEAM CONDENSATE RETURN PUMP		P 6002 C		STEAM CONDENSATE RETURN PUMP	
RATED CAPACITY	351.6	m <sup>3</sup> /h		RATED CAPACITY	157	m <sup>3</sup> /h	
HEAD	155.7	m		HEAD	322	m	
DENSITY@DT	814	kg/m <sup>3</sup>		DENSITY@DT	853	kg/m <sup>3</sup>	
INSULATION/TRACING	NONE			INSULATION/TRACING	NONE		
AUXILIARY PIPING	By Vendor			AUXILIARY PIPING	By Vendor		
ELEV. OF EQUIPMENT	EL. +101.230m			ELEV. OF EQUIPMENT	EL. +101.230m		



03

GENERAL NOTES

- †GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.
- †NOTES:  
1) TWO PHASE FLOW.  
2) LV-6021 B MUST BE LOCATED AS CLOSE AS POSSIBLE TO D-7001. ELEVATION ABOVE D 7001.  
3) THE SPARE PUMP OF P 6002 AB WOULD AUTOSTART WHEN THE OUTLET PRESSURE DECREASED.  
4) FUNCTION OF LICA-6021.  
5) VALVE OPENING, %
- 
- 6) P 6002 C JUST FOR STARTUP CASE.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	30.12.2019	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	02.01.2018	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	06.11.2017	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	05.05.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	22.03.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	22.01.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	13.10.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Issued for Approval	31.08.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Issued for Approval	25.06.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Issued for Comments	29.04.2016	Xu Yekun		Xu Hong	Shi Jing	

OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	STEAM CONDENSATE RETURN PIPING AND INSTRUMENT DIAGRAM	JOB NO.	S-02115	CDR	42	REV.	4
DRAWN		DWG. NO.	1341715	ISSUED		POS			
CONTRACTOR	TCC 中国天辰工程技术有限公司 CHINA TIANCHEN ENGINEERING CORPORATION								
CONTRACTOR DRAWING NO.	MKP-11-AS-6000-PS07-PID-001								
SHEET	01	TOTAL	01						
SUB-CONTRACTOR DRAWING NO.									
SHEET	-	TOTAL	-						

PROJECT	MKP Methanol Project		
UNIT	Saturator Unit		
PHASE	As Built Drawing		
OWNER DWG. NO.	MKP-11-AS-6000-PR-PID-001		

Counter	Sign	Date

03

T 6001 1/2	SATURATOR
DUTY	124.1 MW
DESIGN PRESS.(TU/SH)	55/F/V-45 barg
DESIGN TEMP.(TU/SH)	290/300 °C
INSULATION	YES
ELEV. OF EQUIPMENT	EL +101.250m

X 6001A/B	PARTICLE FILTER
FILTER SURFACE	N/A m <sup>2</sup>
CAPACITY	178000 kg/hr
DESIGN PRESS.	71 barg
DESIGN TEMP.	200 °C
MATERIAL SHELL	SS
MATERIAL FILTER ELEMENT	SS
ELEV. OF EQUIPMENT	EL +101.250m

L 6001	HOIST 6001
TYPE	CHAIN HOIST
CAPACITY	3 t
LIFT HEIGHT	6 m
SLIDING DISTANCE	7 m

GENERAL NOTES

- \*GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.
- \*NOTES:  
1) SYMMETRICAL PIPING  
2) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.  
3) TWO PHASE FLOW.  
4) STEAM TRAPS TO BE PROVIDED AT LOW POINTS.  
5) NOZZLE B2 ON T 6001 1/2 MUST BE ELEVATED MIN. 4m ABOVE P 6002 AB. TO BE CONFIRMED BY VENDOR.  
6) T 6001 1/2 MUST BE LOCATED AT SAME ELEVATION. NOZZLE B2 ON T 6001 1/2 MUST BE LOCATED MIN. 4m ABOVE P 6002 AB. TO BE CONFIRMED BY VENDOR.  
7) FUNCTION OF LY-6051 2
- 
- 8) HOIST IS USED FOR CLEANING OF X 6001 AB.  
9) AS PER EQUIPMENT ENGINEER AND VENDOR'S SUGGESTION, THE VENT NOZZLE OF T 6001 1/2 (V1) ARE MOVED TO THE HIGHEST POINT OF T 6001 1/2 SHELL SIDE TO INCREASE VENTING PERFORMANCE. SINCE THE SPACE IS VERY LIMITED, THE VENT NOZZLE (V1, V2) IS SEPARATED TO TWO NOZZLES (V1 AND V3, V1').

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	30.12.2019	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	13.12.2018	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	06.11.2017	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	05.05.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	22.03.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	22.01.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	13.10.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Approval	31.08.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Approval	25.06.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Comments	29.04.2016	Xu Yekun	Xu Hong	Shi Jing		

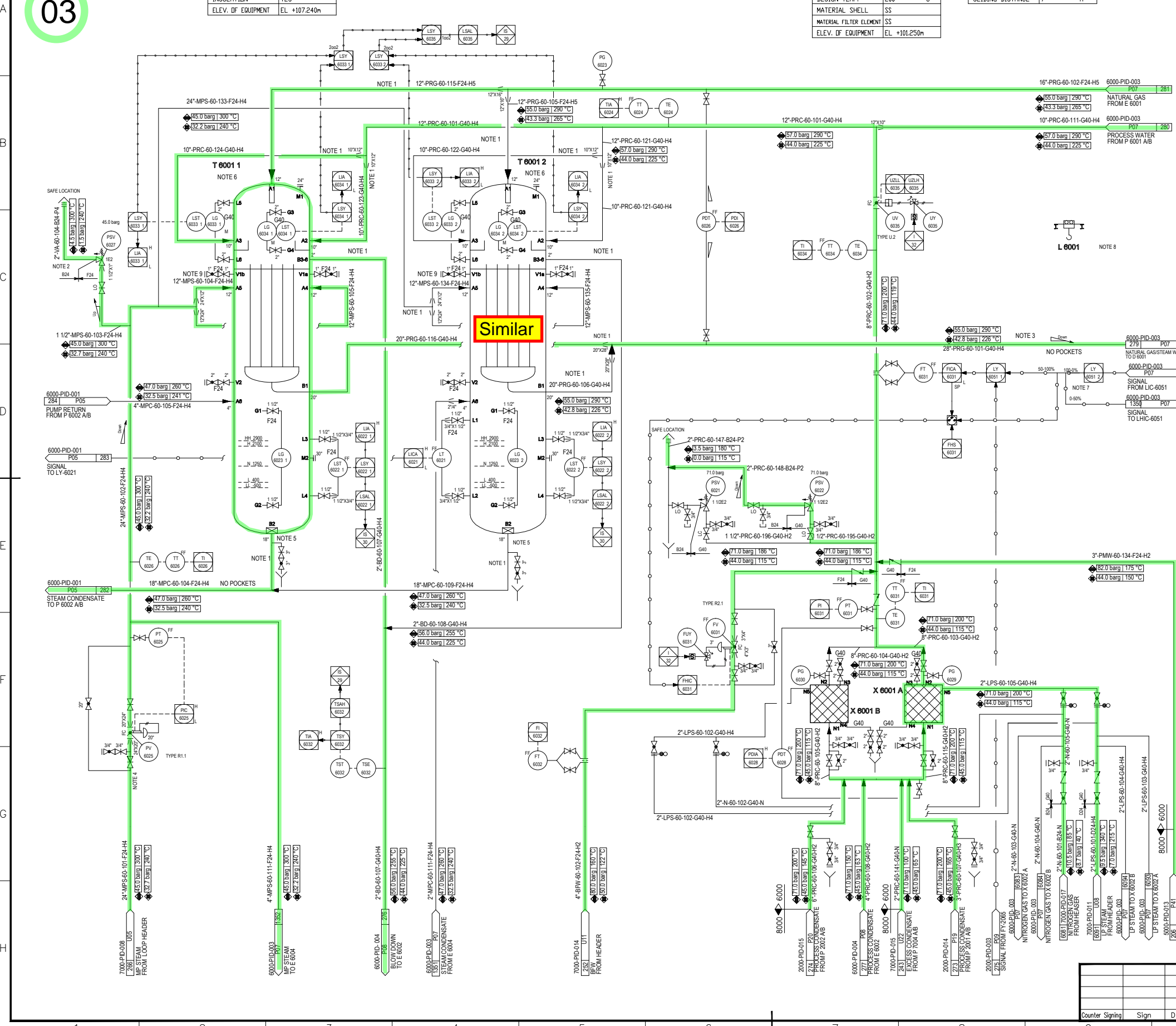
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OWNER: Middle East Kimiaye Pars Company

HALDOR TOPSØE A/S	DOCUMENT NAME: NG SATURATION I PIPING AND INSTRUMENT DIAGRAM	PROJ NO: S-02115	REV: 42
TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO. MKP-11-AS-6000-PS07-PID-002	SHEET 01	TOTAL 01
	SUB-CONTRACTOR DRAWING NO.	SHEET -	TOTAL -

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-6000-PR-PID-002

SCALE: - SHEET: 1 TOT: 1 SIZE: A1

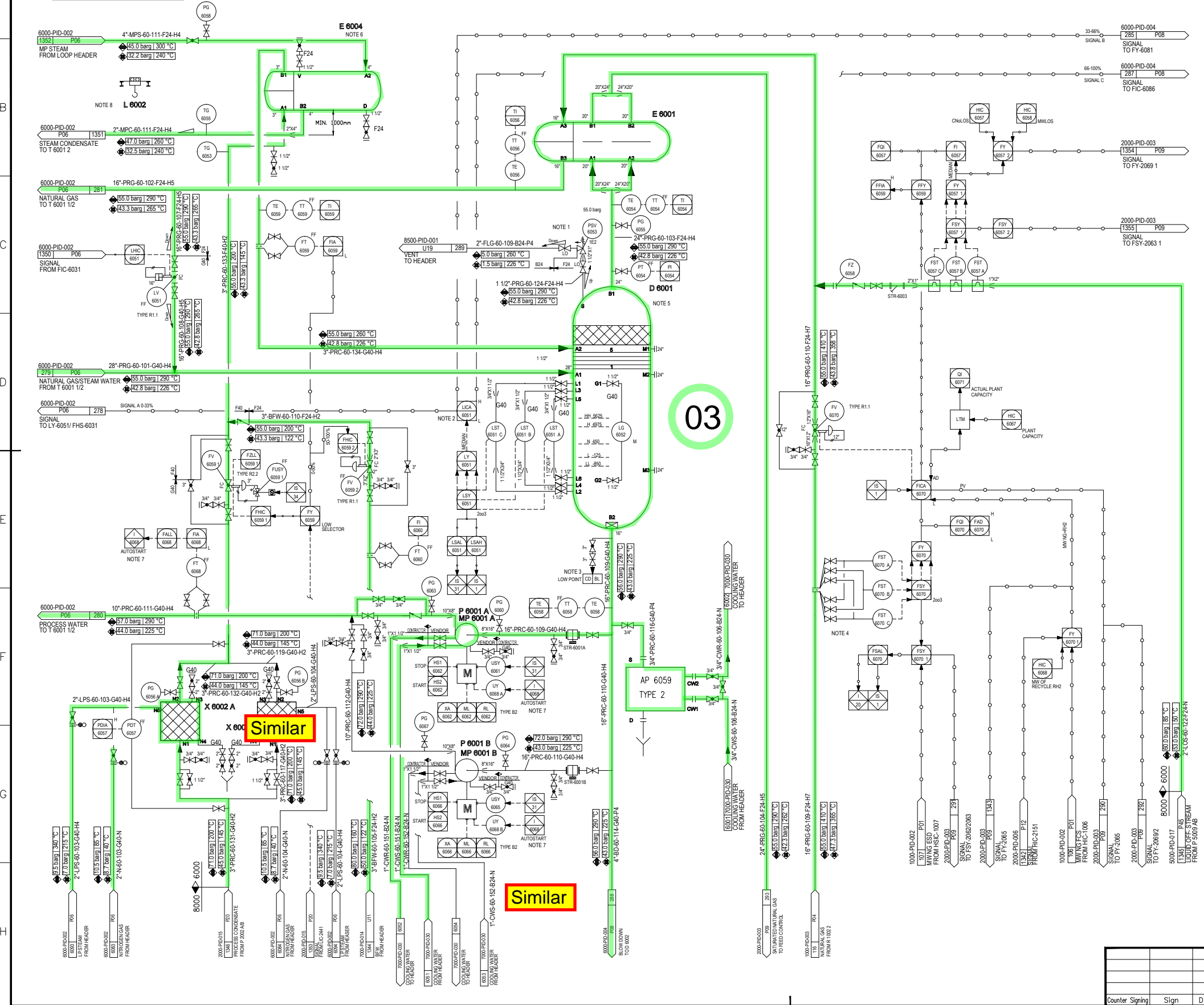


<b>X 6002A/B</b> PARTICLE FILTER FILTER SURFACE: N/A m <sup>2</sup> CAPACITY: 32200 kg/hr DESIGN PRESS.: 71 barg DESIGN TEMP.: 200 °C MATERIAL SHELL: SS MATERIAL FILTER ELEMENT: SS ELEV. OF EQUIPMENT: EL. +101.150m	<b>L 6002</b> HOIST 6002 TYPE: CHAIN HOIST CAPACITY: 2 t LIFT HEIGHT: 6 m SLIDING DISTANCE: 6 m	<b>E 6004</b> WASH WATER PREHEATER DUTY: 2.9 MW DESIGN PRESS.(TU/SH): 55/45 barg DESIGN TEMP.(TU/SH): 260/300 °C INSULATION: YES ELEV. OF EQUIPMENT: EL. +121.550m	<b>P 6001 A/B</b> SATURATOR CIRCULATION PUMP RATED CAPACITY: 416.8 m <sup>3</sup> /h HEAD: 43.5 M DENSITY@OT: 832 kg/m <sup>3</sup> INSULATION/TRACING: NONE AUXILIARY PIPING: By Vendor ELEV. OF EQUIPMENT: EL. +101.260m	<b>D 6001</b> FEED GAS SCRUBBER SEPARATOR ID x LENGTH(T)-D: 3400 x 12400 mm DESIGN PRESS.: 55/F/V barg DESIGN TEMP.: 290 °C INSULATION: YES CLADDING/LINING: NONE ELEV. OF EQUIPMENT: EL. +105.140m	<b>E 6001</b> SATURATOR FEED/EFFL. EXCHANGER DUTY: 10.0 MW DESIGN PRESS.(TU/SH): 55/55 barg DESIGN TEMP.(TU/SH): 410/290 °C INSULATION: YES ELEV. OF EQUIPMENT: EL. +126.350m
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**GENERAL NOTES**

GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

NOTES:  
1) TO BE LOCATED ABOVE FLARE HEADER.  
2) FUNCTION OF LIC-6051  
  
3) THE CLOSED DRAIN WILL BE COLLECTED IN A PORTABLE SEALED CONTAINER.  
4) P&T COMPENSATION FROM PIC-1045, TI-1045; MW COMPENSATION FROM HIC-1006.  
5) NOZZLE B2 ON D 6001 MUST BE LOCATED MIN 2m ABOVE P 6001 A/B. (TO BE CONFIRMED BY PUMP VENDOR.)  
6) E 6004 TO BE LOCATED MIN. 5m ABOVE MAX LEVEL IN T 6001 1/2.  
7) THE SPARE PUMP OF P 6001 A/B WOULD AUTOSTART WHEN THE OUTLET FLOWRATE DECREASED.  
8) HOIST IS USED FOR CLEANING OF X 6002 A/B.



**REFERENCE DRAWINGS**


**SYMBOLS AND LEGENDS**


**KEY PLAN**


REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	30.12.2019	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	13.12.2018	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	02.02.2018	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	06.11.2017	Xu Yekun	Xu Hong	Liu Shengkol		
▲	Approved for Construction	05.05.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	22.03.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	22.01.2017	Xu Yekun	Xu Hong	Shi Jing		
▲	Approved for Construction	13.10.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Approval	31.08.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Approval	25.06.2016	Xu Yekun	Xu Hong	Shi Jing		
▲	Issued for Comments	29.04.2016	Xu Yekun	Xu Hong	Shi Jing		

OWNER: Middle East Kimiaye Pars Company

DESIGNER: HALDOR TOPSØE A/S	DOCUMENT NAME: NG SATURATION II PIPING AND INSTRUMENT DIAGRAM	PROJ NO: S-02115	REV: 42
DATE: 13/04/2017	DRAWN BY: PS07	CHECKED BY: PS07	REV: 1
CONTRACTOR DRAWING NO. MKP-11-AS-6000-PS07-PID-003			
SHEET 01 TOTAL 01			
SUB-CONTRACTOR DRAWING NO.			
SHEET - TOTAL -			

PROJECT: MKP Methanol Project	UNIT: Saturator Unit
PHASE: As Built Drawing	OWNER DWG NO: MKP-11-AS-6000-PR-PID-003

E 6002	PROCESS CONDENSATE PREHEATER
DUTY	0.7 MW
DESIGN PRESS.(TLU/SH)	71/56 barg
DESIGN TEMP.(TLU/SH)	255/ 255 °C
INSULATION	YES
ELEV. OF EQUIPMENT	EL +101.230m

P 7003 A/B/C	EXCESS PROCESS CONDENSATE PUMP
RATED CAPACITY	22 m3/h
HEAD	63.22 M
DENSITY@DT	959 kg/m3
INSULATION/TRACING	NONE
AUXILIARY PIPING	By Vendor
ELEV. OF EQUIPMENT	EL +101.060m

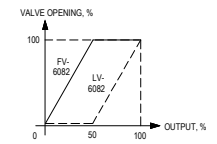
D 6002	SATURATOR BLOW DOWN DRUM
ID x LENGTH(T-D)	1300 x 4375mm
DESIGN PRESS.	3.5 barg
DESIGN TEMP.	125 °C
INSULATION	NO
CLADDING/LINING	PERSONNEL PROTECTION
ELEV. OF EQUIPMENT	EL +107.240m

E 6003	SATURATOR BLOW DOWN COOLER
DUTY	1.9 MW
DESIGN PRESS.(TLU/SH)	7.5/9.9 barg
DESIGN TEMP.(TLU/SH)	100/125 °C
INSULATION	YES
ELEV. OF EQUIPMENT	EL +101.355m

**GENERAL NOTES**

†GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

- †NOTES:  
1) TWO PHASE FLOW.  
2) FV-6081 AND FV-6086 MUST BE LOCATED CLOSE TO D 6002.  
3) FUNCTION OF LIC-6082



- †4) NOZZLE B ON D 6002 MUST BE LOCATED MIN. 5m ABOVE P 7003 A/B/C (TO BE CONFIRMED BY PUMP VENDOR).  
5) THE SPARE PUMP OF P 7003 A/B/C WOULD AUTOSTART WHEN THE OUTLET PRESSURE DECREASED.  
6) IN NORMAL CONDITION, THE FLOW RATE OF LINE 4"-BD-60-138-B40-N IS 0. THE MAXIMUM OPERATING TEMPERATURE OF THIS LINE IS 65°C WHEN ITS FLOW RATE ACHIEVED THE MAXIMUM VALUE.  
7) DURING THE MAXIMUM FLOW RATE PHASE, ALL OF THE THREE PUMPS WILL BE UNDER OPERATION.

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

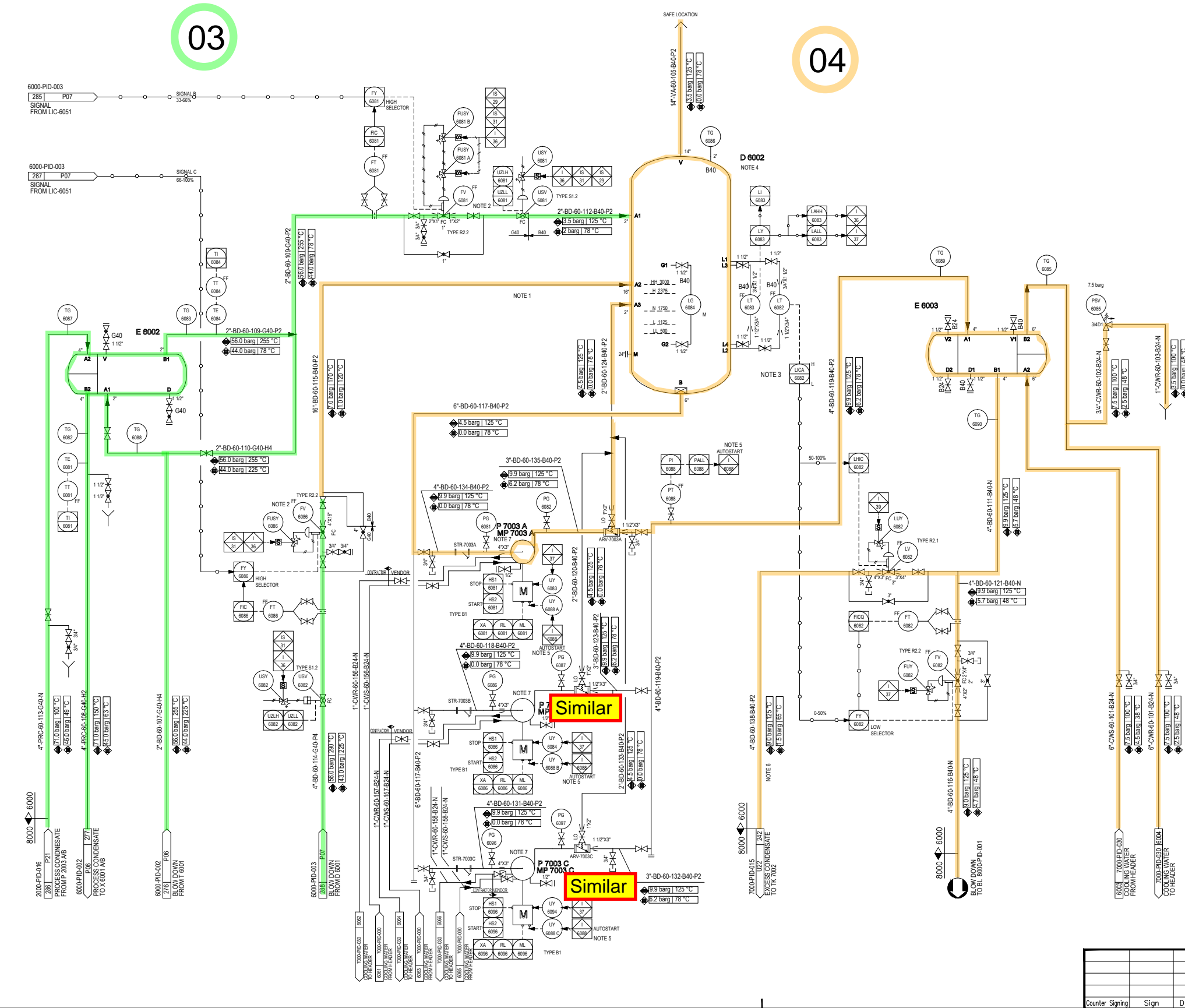
REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	02.02.2018	Xu Yekun		Xu Hong	Liu Shengkol	
▲	Approved for Construction	05.05.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	22.03.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	22.01.2017	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	13.10.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Approved for Construction	31.08.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Issued for Approval	25.06.2016	Xu Yekun		Xu Hong	Shi Jing	
▲	Issued for Comments	29.04.2016	Xu Yekun		Xu Hong	Shi Jing	

OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	NG SATURATION III PIPING AND INSTRUMENT DIAGRAM	PROJ NO	S-02115	REV	42
CONTRACTOR	TCC 中国天辰工程技术有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-6000-PS07-PID-004	SHEET	01	TOTAL	01
OWNER	Middle East Kimiaye Pars Company	SUB-CONTRACTOR DRAWING NO.		SHEET		TOTAL	

PROJECT	MKP Methanol Project
UNIT	Saturator Unit
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-6000-PR-PID-004

SCALE: - SHEET: 1 TOT: 1 SIZE: A1

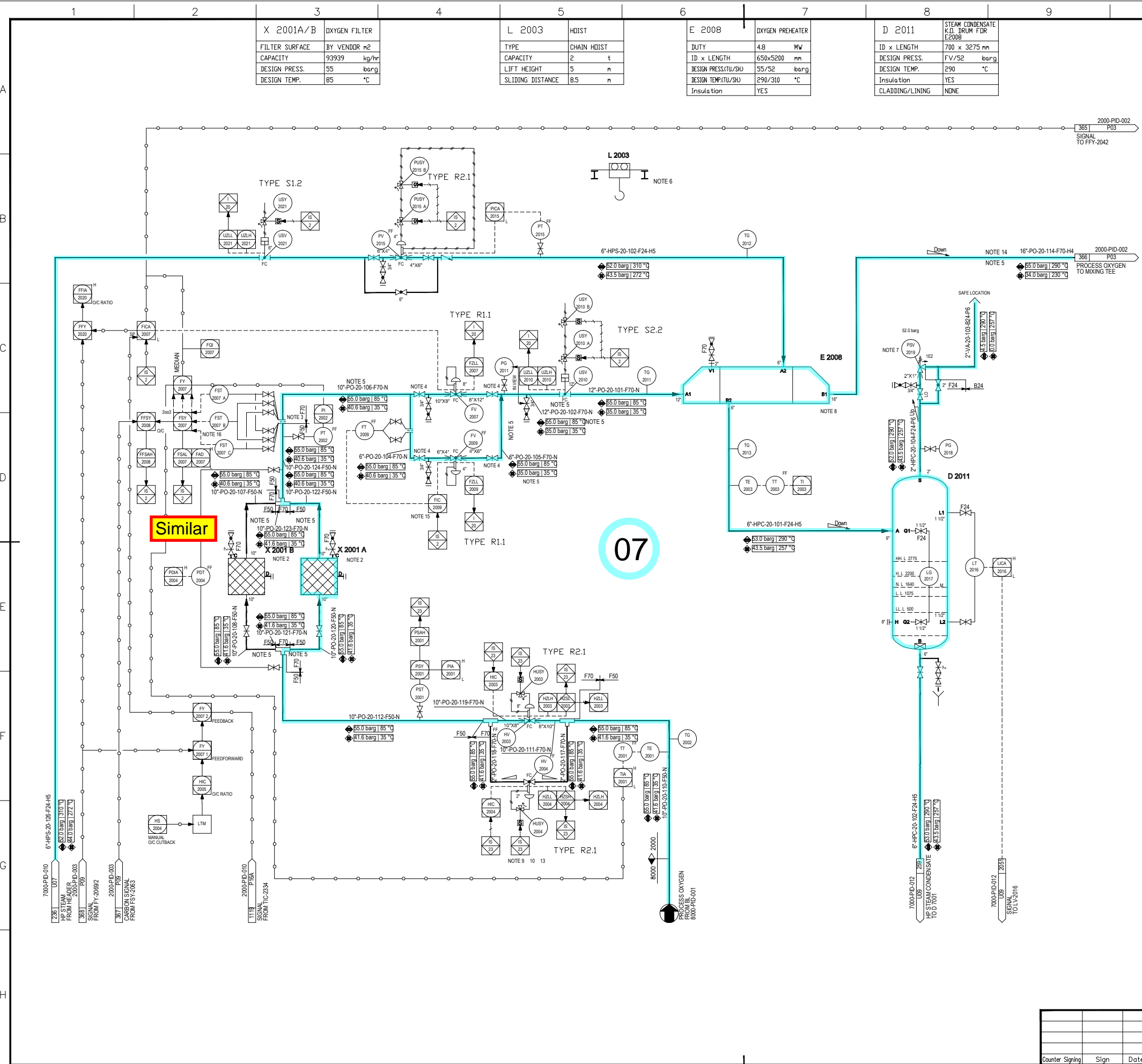


03

04

Similar

Similar



**GENERAL NOTES**

NOTES:

- X 2001 A/B MUST BE LOCATED CLOSE TO E 2008 AT GROUND LEVEL. BOTH FILTERS TO BE PRESSURIZED SIMULTANEOUSLY DURING START UP. ONCE PRESSURIZED, ONE BLOCK INLET FILTER MAY BE CLOSED. FILTERS NOT TO BE REPLACED ON STREAM.
- ORIFICE FLANGE TO BE PROVIDED WITH INDIVIDUAL PRESSURE TAPPING FOR EACH TRANSMITTERS.
- ALL INTERNALS FOR VALVES IN OXYGEN SERVICE MUST BE MONEL.
- IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED. LONG RADIUS BENDS 3D.
- THE HOIST IS USED FOR X-2001A/B MAINTENANCE.
- 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT AND ROUTED TO SAFE AND SUITABLE LOCATION BELOW TAPPING POINT.
- E 2008 CONDENSATE OUTLET NOZZLE TO BE ELEVATED ABOVE A NOZZLE ON D 2011. E 2008 MUST BE LOCATED ABOVE SEC. REFORMER BURNER.
- BY PASS FOR PRESSURIZATION SHALL BE MADE OF MONEL. CONNECTIONS HAVE TO BE TOP OF MAIN LINE.
- VALVE TO BE IN MONEL INCL. MIN. 8 DIAMETERS DOWNSTREAM PIPING.

**REFERENCE DRAWINGS**


**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	30.12.2019	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	06.11.2017	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	05.05.2017	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	22.03.2017	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	23.01.2017	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	10.11.2016	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	12.10.2016	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	31.08.2016	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Approval for Construction	16.06.2016	Wang Furui	Gao Zhihu	Liu Shengkol		
▲	Issued for Comments	29.04.2016	Wang Furui	Gao Zhihu	Liu Shengkol		

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OWNER: Middle East Kimiaye Pars Company

OWNER	HALDOR TOPSØE A/S	DOCUMENT NAME	PROCESS OXYGEN PIPING AND INSTRUMENT DIAGRAM	NO. OF SHEETS	42	REV.	5
CONTRACTOR	TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-001	SHEET	01	TOTAL	01
		SUB-CONTRACTOR DRAWING NO.					
		SHEET		TOTAL			

PROCESS OXYGEN PIPING AND INSTRUMENT DIAGRAM

PROJECT: MKP Methanol Project

UNIT: Reformer

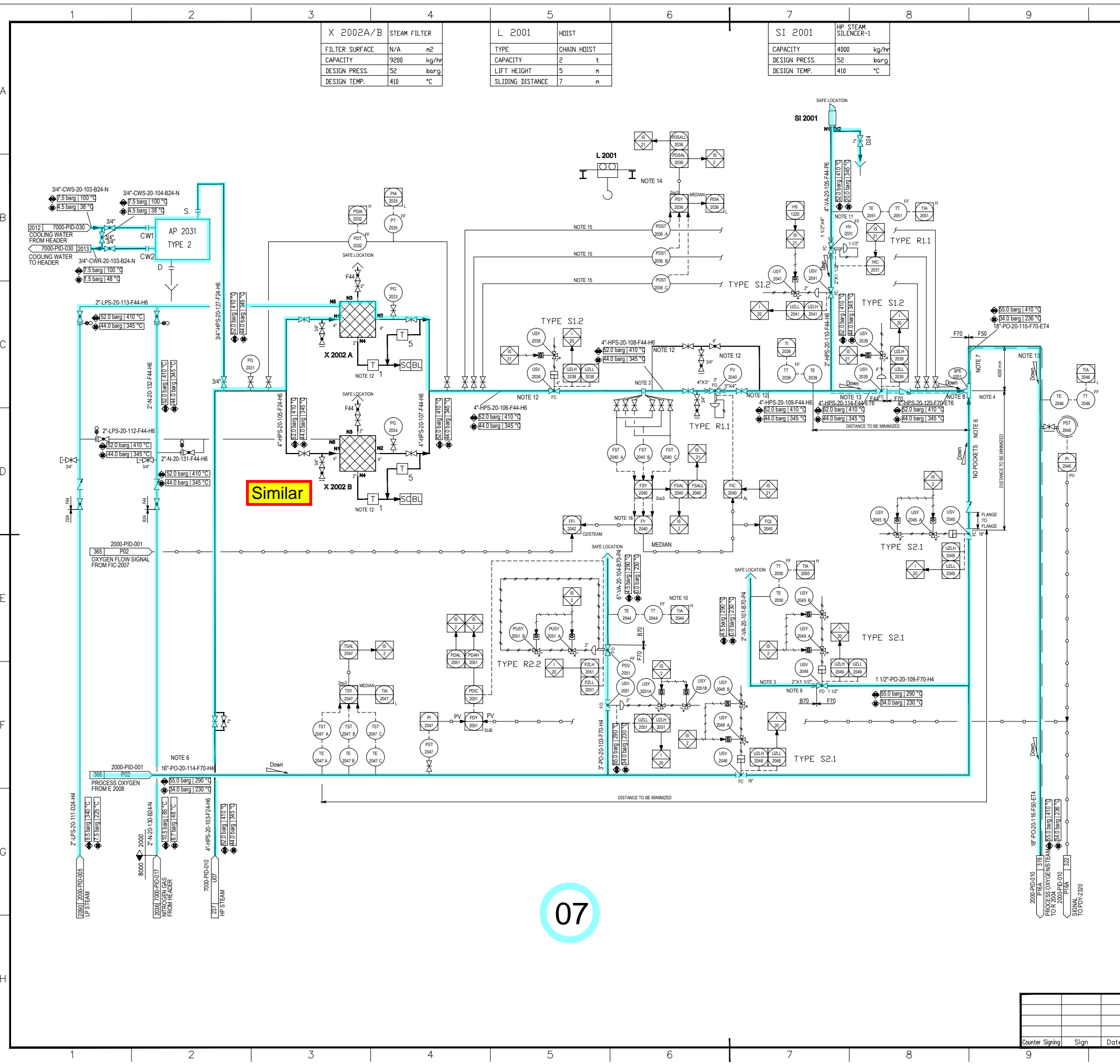
PHASE: As Built Drawing

OWNER DWG NO.: MKP-11-AS-2000-PR-PID-001

SCALE: SHEET:1 TOT:1 SIZE: A1

Counter Signing Sign Date





X 2002A/B STEAM FILTER		
FILTER SURFACE	N/A	m <sup>2</sup>
CAPACITY	9200	kg/hr
DESIGN PRESS.	52	barg
DESIGN TEMP.	410	°C

L 2001 HOIST	
TYPE	CHAIN HOIST
CAPACITY	2 t
LIFT HEIGHT	5 m
SLIDING DISTANCE	7 m

SI 2001 HP STEAM SILENCER-1	
CAPACITY	4000 kg/hr
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C

**GENERAL NOTES**

- NOTES:
- ORIFICE FLANGE TO BE PROVIDED WITH INDIVIDUAL PRESSURE TAPPING FOR EACH TRANSMITTERS.
  - NO POCKETS ALLOWED.
  - DETAILED DESIGNER MUST CONSIDER THERMAL STRESSES IN THE MIXING POINT. THE TEE MUST BE MOUNTED TO ENSURE A STRAIGHT FLOW OF OXYGEN.
  - ANY ELBOWS BETWEEN O<sub>2</sub> / STEAM MIXING TEE AND R 2004 MUST BE WITH LONG RADIUS (1.5 D)
  - IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED. LONG RADIUS BENDS 3D.
  - MIN. LENGTH OF MONEL PIPE FROM MIXING POINT: 4m. DISTANCE TO R 2004 MUST BE MINIMIZED.
  - PIPE MUST BE DESIGNED IN MATERIALS AS SPECIFIED IN F70 (MONEL) BUT MUST BE ABLE TO WITHSTAND DESIGN TEMPERATURE AND DESIGN PRESSURE AS SPECIFIED.
  - BLEED TO BE TAKEN FROM BOTTOM OF OXYGEN LINE AND ROUTED TO SAFE LOCATION BELOW TAPPING POINT.
  - START-UP PREHEATING OF OXYGEN LINE IT MUST BE POSSIBLE TO OPERATE THIS BLEED AFTER IS-2 IS RESET BUT BEFORE DOUBLE BLOCK AND BLEED IS RESET
  - 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT AND ROUTED TO SAFE AND SUITABLE LOCATION BELOW TAPPING POINT.
  - STEAM TRAPS AT LOW POINTS/ DEAD ENDS MUST BE PROVIDED.
  - MI CABLE TRACING TO 250 °C.
  - THE HOIST IS USED FOR X-2002AB MAINTENANCE.
  - BYPASS LINE IN MANIFOLD IS NOT ALLOWED
  - P&T COMPENSATION FROM PIC-7003, TI-7007

GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.  
IN OXYGEN PIPES ALL SHARP BENDS MUST BE AVOIDED. LONG RADIUS BENDS 3D.

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

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OWNER: **Middle East Kimiaye Pars Company**

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	OXYGEN PREHEATING PIPING AND INSTRUMENT DIAGRAM	NO. OF SHEETS	42	REV.	5
DRAWN		DRAWING NO.	1341713	STATUS	PO3		

CONTRACTOR	<b>TCC 中国天辰工程有限公司</b>	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-002
		SHEET	01 TOTAL 01
		SUB-CONTRACTOR DRAWING NO.	
		SHEET	TOTAL

OXYGEN PREHEATING PIPING AND INSTRUMENT DIAGRAM		PROJECT	MKP Methanol Project
		UNIT	Reformer
		PHASE	As Built Drawing
SCALE	SHEET:1	TOT:1	SIZE: A1
OWNER DWG. NO.	MKP-11-AS-2000-PR-PID-002		

07

05

GENERAL NOTES

- NOTES:
- 1) METHANOL INJECTION CONNECTION.
  - 2) DISTANCE MINIMISED BETWEEN PROCESS VENT AND E 2002 B.
  - 3) SUBSEQUENT TO IS-1 THIS SET POINT IS RAMPED DOWN.
  - 4) P&T COMPENSATION FROM PIC-7003, TI-7007
  - 5) P&T COMPENSATION FROM PI-2061, TI-2061
  - 6) FV-2073 includes 4 noise reduction disks, the size is 14"-24" and the reducer considered by piping.
  - 7) FV-2073
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENTS MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS


SYMBOLS AND LEGENDS

KEY PLAN

As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	30.12.2019	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	05.05.2017	Wang Furu	Gao Zhihu	Liu Shengkol
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Approval for Construction	10.11.2016	Wang Furu	Gao Zhihu	Liu Shengkol
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Approval for Construction	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkol

OWNER: Middle East Kimiaye Pars Company

HALDOR TOPSØE A/S	DOCUMENT NAME: S/C RATIO CONTROL I PIPING AND INSTRUMENT DIAGRAM	PROJ NO: S-02115	REV: 42
TCC 中国天辰工程有限公司		CONTRACTOR DRAWING NO. 1341710	PAGE 01
		SHEET 01	TOTAL 01
		SUB-CONTRACTOR DRAWING NO.	
		SHEET --	TOTAL --

S/C RATIO CONTROL I PIPING AND INSTRUMENT DIAGRAM	PROJECT: MKP Methanol Project
	UNIT: Reformers
	PHASE: As Built Drawing
SCALE: SHEET:1 TOT:1 SIZE: A1	OWNER DWG NO. MKP-11-AS-2000-PR-PID-003

Counter Signing	Sign	Date

05

SI 2003	HP STEAM SILENCER-2
CAPACITY	4000 kg/hr
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C

GENERAL NOTES

- NOTES:
- 1) TOP ENTRY CONNECTION.
  - 3) DISTANCE MINIMIZED BETWEEN PROCESS VENT AND E 2002.
  - 4) 1/2" DRIPHOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - 5) OPERATED LOCAL.
  - 6) MIN. DISTANCE BETWEEN USV-2092 AND USV-2093.
  - 8) CONSIDER DRAIN LINE AT LOW POINT.
  - 9) P&T COMPENSATION FROM PIC-2073,TI-2061.
  - 10) P&T COMPENSATION FROM PI-2150,TI-2150.

GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	28.12.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

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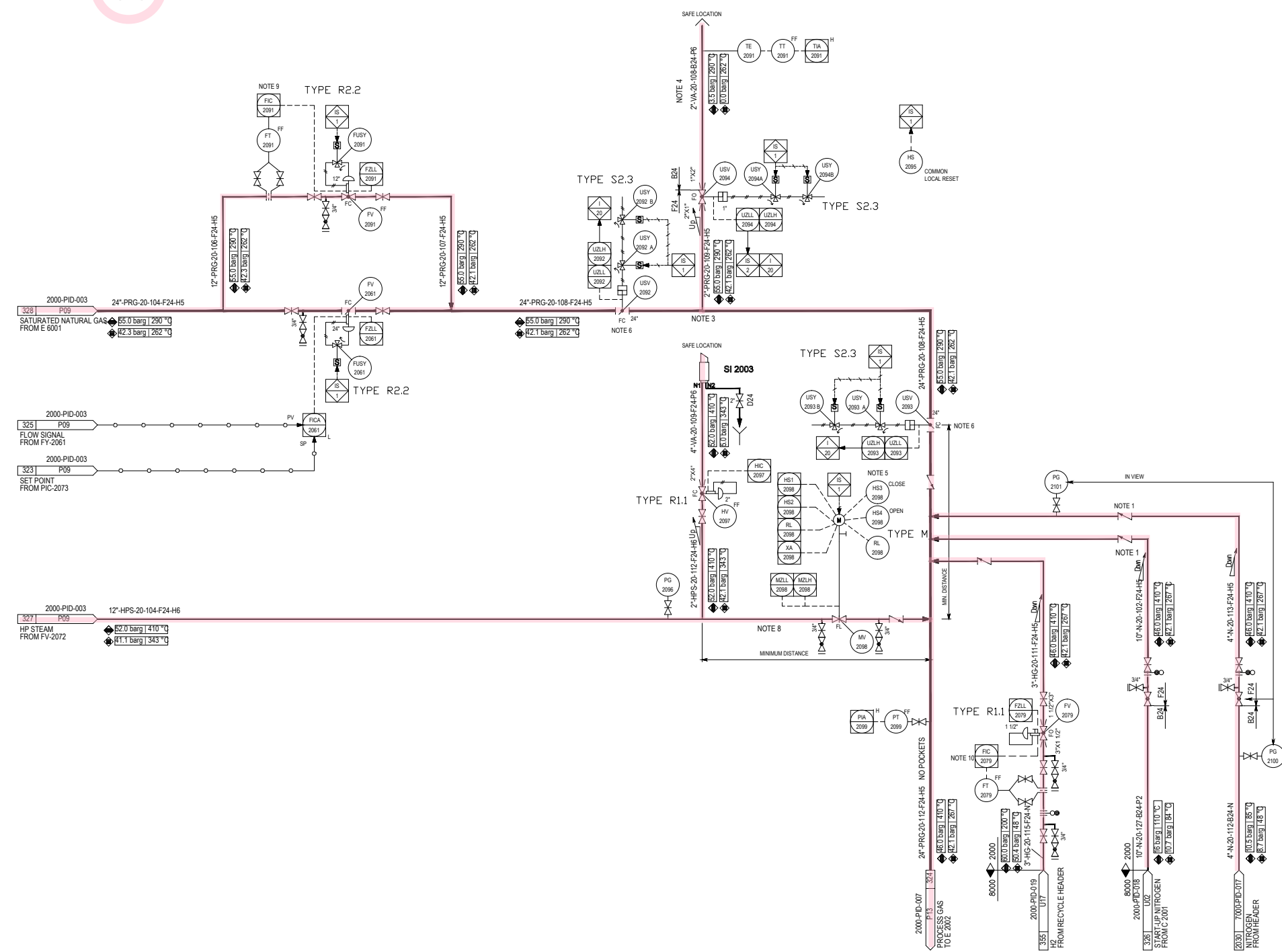
OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	S/C RATIO CONTROL II PIPING AND INSTRUMENT DIAGRAM	PRO NO.	S-02115	REV.	42
DRAWN		DATE		CONTRACTOR DRAWING NO.	1341720	TOTAL	01

CONTRACTOR	TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION	SUB-CONTRACTOR DRAWING NO.	
CONTRACTOR		SHEET	01
CONTRACTOR		TOTAL	01

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-004

SCALE	SHEET:1	TOT:1	SIZE: A1
Counter Signing	Sign	Date	



1 2 3 4 5 6 7 8 9 10 11 12

F 2002	COMBUSTION AIR BLOWER
CAPACITY	424237 kg/hr
PRESS. (SUC./DIS.)	-0.012/0.034 barg
TEMP. (SUC./DIS.)	48/ °C
DRIVE POWER	1400 kW
AUXILIARY PIPING	By Vendor

FT 2002	STEAM TURBINE FOR F 2002
TYPE	BACK PRESSURE
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C
RATED POWER	1350 kW

SI 2005	HP STEAM SILENCER-3
CAPACITY	6000 kg/hr
DESIGN PRESS.	52 barg
DESIGN TEMP.	410 °C

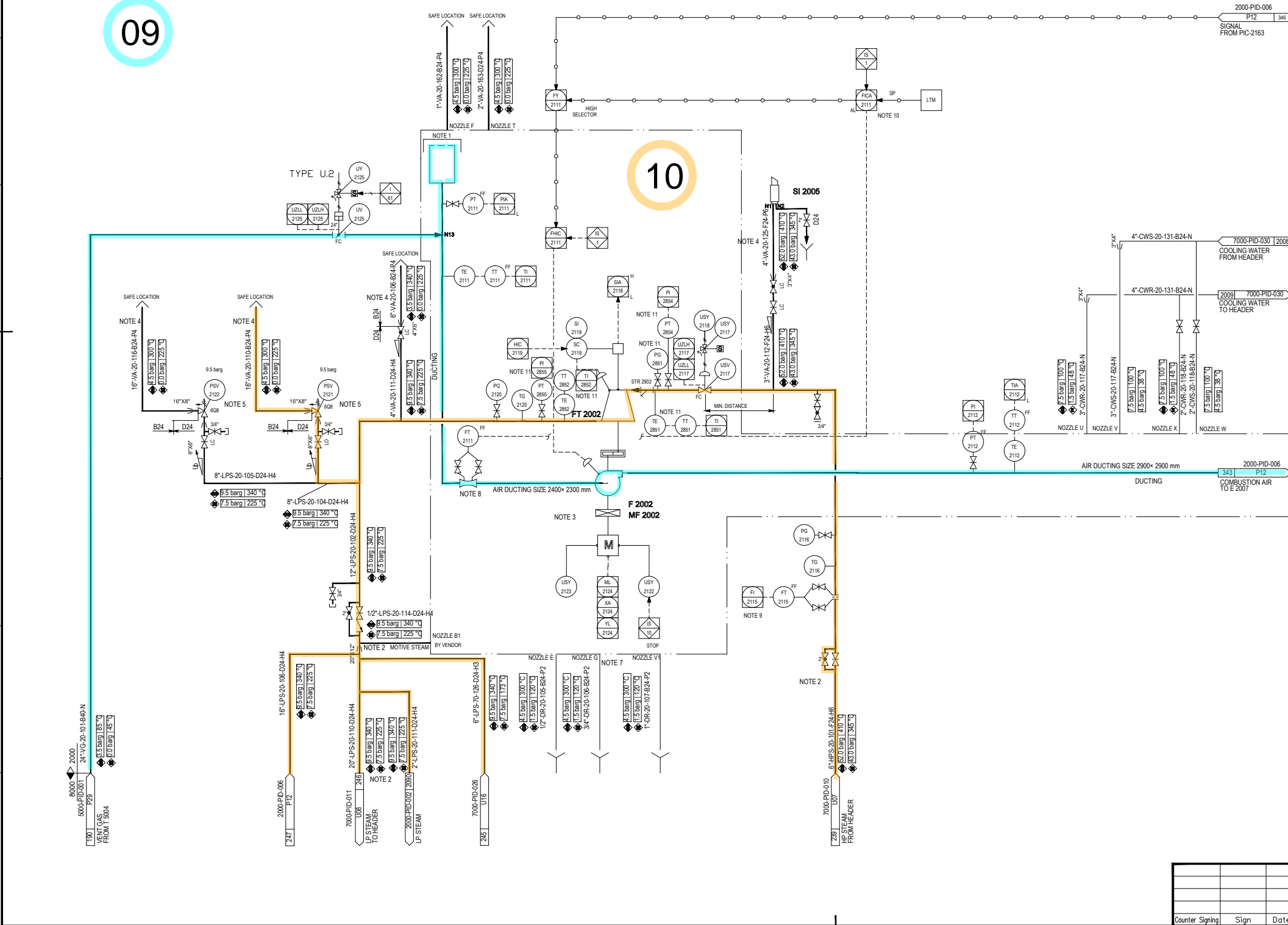
**GENERAL NOTES**

- NOTES:
- AIR INTAKE WITH DUST FILTER TO BE LOCATED MINIMUM 5 m ABOVE GRADE.
  - PIPE SIZES FOR STEAM AT FT-2002 BY TURBINE VENDOR.
  - VENDOR SCOPE TO BE DETAILED BY VENDOR.
  - 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY
  - THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
  - THE FLOWMETER ELEMENT IS SUPPLIED BY PRIMARY REFORMER VENDOR
  - P&T COMPENSATION FROM PIC-7003.TI-7107
  - P&T COMPENSATION FROM PIC-2111.TI-2111
  - THE TEMPERATURE INDICATOR/GAUGE(TT-2851/2852) AND THE PRESSURE INDICATOR/GAUGE (PT-2854/PT-2855/PG-2851) ARE SUPPLIED BY FT2002 VENDOR. PLEASE FIND VENDOR DOCUMENT FOR DETAILS.

GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

09

10



**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

As Built	30.04.2020	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	30.12.2019	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	06.11.2017	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	05.05.2017	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	22.03.2017	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	23.01.2017	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	10.11.2016	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	12.10.2016	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	31.08.2016	Wang Furu	Gao Zhihui	Liu Shengkol
Approval for Construction	16.06.2016	Wang Furu	Gao Zhihui	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihui	Liu Shengkol

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OWNER: Middle East Kimiaye Pars Company

DESIGNED BY	HALDOR TOPSØE A/S	DOCUMENT NAME	FLUE GAS WHS I PIPING AND INSTRUMENT DIAGRAM	PROJ NO	S-02115	REV	4
DRAWN BY		SCALE		CONTRACTOR DRAWING NO.	1341721	TOTAL	01
CHECKED BY		DATE		SUB-CONTRACTOR DRAWING NO.		TOTAL	
APPROVED BY				SHEET		TOTAL	

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-005

Counter Sign Sign Date

1 2 3 4 5 6 7 8 9 10 11 12

09

12

11

02

S 2001	FLUE GAS STACK	F 2001	FLUE GAS BLOWER	FT 2001	STEAM TURBINE FOR F 2001	E 2007	COMBUSTION AIR PREHEATER	E 2006	1st NATURAL GAS FEED PREHEAT COIL	SI 2006	HP STEAM SILENCER-4
CAPACITY	4392510 Nm <sup>3</sup> /h	CAPACITY	469314 kg/hr	TYPE	BACK PRESSURE	DUTY	14.3 MW	DUTY (EGR-rich gas)	17.7 MW	CAPACITY	8000 kg/hr
DESIGN PRESS.	Ambient barg	PRESS. (SUC./DIS.)	-0.05/0 barg	DESIGN PRESS.	52 barg	DESIGN PRESS.(COIL)	BY VENDOR barg	DESIGN PRESS.(COIL)	55 barg	DESIGN PRESS.	52 barg
DESIGN TEMP.	250 °C	TEMP. (SUC./DIS.)	150/ °C	DESIGN TEMP.	410 °C	DESIGN TEMP.(COIL)	210 °C	DESIGN TEMP.(COIL)	350 °C	DESIGN TEMP.	410 °C
		DRIVE POWER	2350 kW	RATED POWER	2500 kW						
		AUXILIARY PIPING	By Vendor								

**GENERAL NOTES**

- NOTES:
- PST-2163 A/B/C TO BE LOCATED AS CLOSE AS POSSIBLE TO H 2001.
  - GUIDE VANES
  - PIPE SIZES FOR STEAM AT FT 2001 BY TURBINE VENDOR.
  - 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - SIZE OF AIR DAMPER IS DETERMINED BY VENDOR
  - AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY
  - THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR.
  - INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
  - THE PIPE AND VALVE FOR AP-2160 IS SUPPLIED BY PRIMARY REFORMER VENDOR
  - P&T COMPENSATION FROM PI-2150, TI-2150
  - P&T COMPENSATION FROM PIC-1006, TI-2151
  - P&T COMPENSATION FROM PIC-7003, TI-7007
  - THE TEMPERATURE INDICATOR/GAUGE (TI-2801/2802) AND THE PRESSURE INDICATOR/GAUGE (PI-2804/PT-2805/PI-2801) ARE SUPPLIED BY FT2001 VENDOR.
  - PLEASE FIND VENDOR DOCUMENT FOR DETAILS.
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	30.12.2019	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	06.11.2017	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	05.05.2017	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	22.03.2017	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	23.01.2017	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	28.12.2016	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	10.11.2016	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	12.10.2016	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	31.08.2016	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Approval for Construction	16.06.2016	Wang Furui			Gao Zhihui	Liu Shengkol
▲	Issued for Comments	29.04.2016	Wang Furui			Gao Zhihui	Liu Shengkol

OWNER: Middle East Kimiaye Pars Company

CONTRACTOR	HALDOR TOPSØE A/S	DOCUMENT NAME	FLUE GAS WHS II PIPING AND INSTRUMENT DIAGRAM	NO. OF SHEETS	42	REV.	4
CONTRACTOR	TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-006	SHEET	01	TOTAL	01
CONTRACTOR		SUB-CONTRACTOR DRAWING NO.		SHEET		TOTAL	

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG. NO.	MKP-11-AS-2000-PR-PID-006

SCALE	SHEET:1	TOT:1	SIZE: A1
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Counter	Sign	Date
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E 2001	REFORMER FEED PREHEAT COIL	E 2002	PREREFORMER FEED PREHEAT COIL	E 2004	2nd NATURAL GAS FEED PREHEAT COIL
DUTY(EDR-rich gas)	53.5 MW	DUTY(EDR-rich gas)	61.8 MW	DUTY(EDR-rich gas)	14.3 MW
DESIGN PRESS.(COIL)	46 barg	DESIGN PRESS.(COIL)	46 barg	DESIGN PRESS.(COIL)	55 barg
DESIGN TEMP.(COIL)	705 °C	DESIGN TEMP.(COIL)	610 °C	DESIGN TEMP.(COIL)	440 °C
		Elevation	EL. +107.05m		

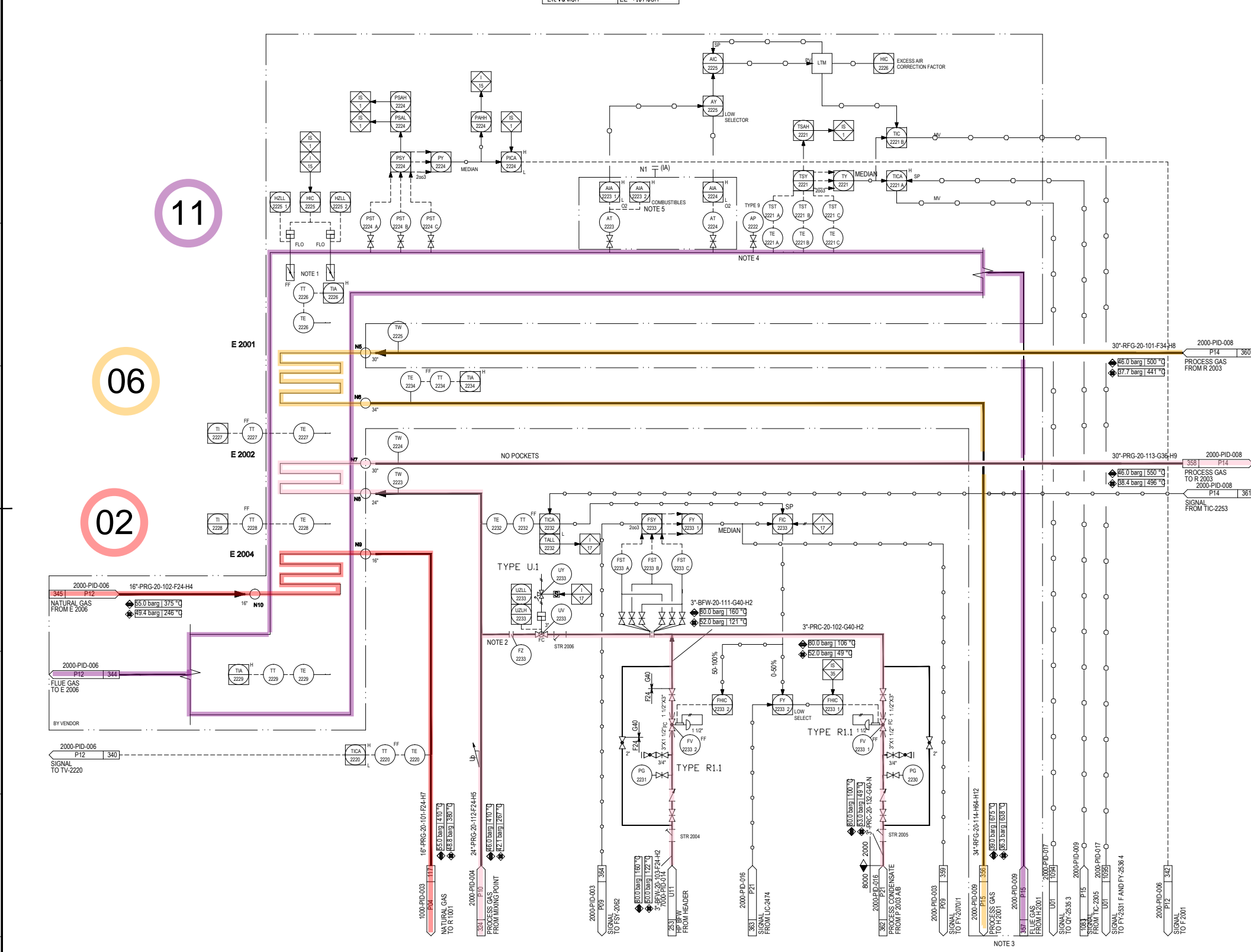
**GENERAL NOTES**

- NOTES:
- 1) FALSE AIR DAMPER.
  - 2) SPRAY NOZZLES TO BE INSTALLED ACCORDING TO VENDOR INSTRUCTIONS.
  - 3) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
  - 4) THE PIPE AND VALVE FOR AP-2222 IS SUPPLIED BY PRIMARY REFORMER VENDOR
  - 5) WHEN THERE IS NO INSTRUMENT AIR SUPPLY FOR THE ANALYZER AT-2223, THE LAST EFFECTIVE DATA SHALL BE RECORDED IN FCS.
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

11

06

02



**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

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OWNER:

Middle East Kimiaye Pars Company

HALDOR TOPSOE A/S TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION	DOCUMENT NAME:	FLUE GAS WHS III PIPING AND INSTRUMENT DIAGRAM	PROJ NO:	S-02115	CONV. NO.:	42	REV.:	4
	CONTRACTOR DRAWING NO.:	1341723	DRAWING NO.:	020007	SHEET:	01	TOTAL:	01
SUB-CONTRACTOR DRAWING NO.:								
SHEET -- TOTAL --								

PROJECT:	MKP Methanol Project
UNIT:	Reformer
PHASE:	As Built Drawing
OWNER DWG. NO.:	MKP-11-AS-2000-PR-PID-007

Counter	Sign	Date

SCALE:	SHEET: 1	TOT: 1	SIZE: A1
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05

R 2003	PREREFORMER
ID x LENGTH	3900 x 2600mm
DESIGN PRESS.	46 barg
DESIGN TEMP.	550 °C
Insulation	YES
CLADDING/LINING	NONE

05

GENERAL NOTES

- NOTES:
- 1) ISOLATE PREREFORMER DURING OPENING OF DOWNSTREAM SYSTEM TO PREVENT AIR INGRESS TO CATALYST.
- GENERAL NOTE:
- LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

As Built	30.04.2020	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	02.02.2018	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	06.11.2017	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	05.05.2017	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	22.03.2017	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	10.11.2016	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	12.10.2016	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	31.08.2016	Wang Furui	Gao Zhihu	Liu Shengkol
Approval for Construction	16.06.2016	Wang Furui	Gao Zhihu	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furui	Gao Zhihu	Liu Shengkol

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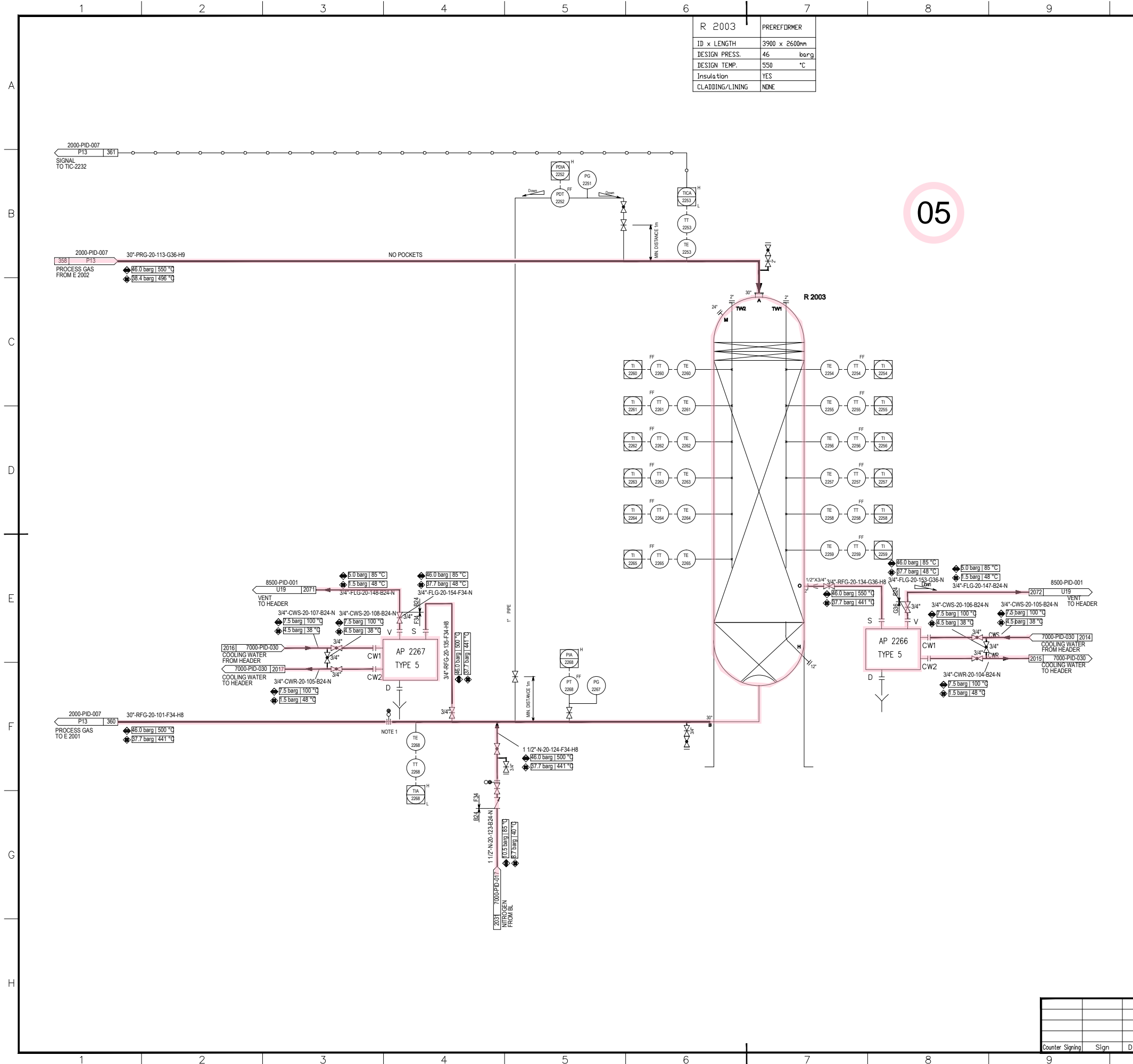
OWNER:

Middle East  
Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	PREREFORMING PIPING AND INSTRUMENT DIAGRAM	JOB NO.	S-02115	DATE	2018	REV.	42
CONTRACTOR	TCC 中国天辰工程技术有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-008	SCALE	1:1	SHEET NO.	01	TOTAL	01
OWNER		SUB-CONTRACTOR DRAWING NO.		SHEET		TOTAL			

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-008

Counter	Sign	Date



H 2001	PRIMARY REFORMER
CAPACITY	154.1 Mw
DESIGN PRESS.(COIL)	39 barg
DESIGN TEMP.(COIL)	850 °C

**GENERAL NOTES**

- \*NOTES:
- 1) HIGH PRESSURE IN REFORMER FURNACE BOX ACTIVATES HAZARD FLASHERS, THREE FLASHERS ARE LOCATED AT EACH END OF THE REFORMER AND ON EACH FLOOR.
  - 2) FUEL PIPING TO BE SYMMETRICAL.
  - 3) FUEL PIPING AND AIR DUCTING TO BE SUPPLIED WITH FLANGES AT THE END OF SUBHEATERS. IF WELDED CAPS ARE SUPPLIED THESE MUST BE REMOVED FOR PIPE BLOWING.
  - 4) END CAP FOR DISTRIBUTOR TO BE FIELD WELDED AFTER PIPE BLOWING.
  - 5) MIN 4 m INCOLOY 600 PIPE OF 1".
  - 6) COLD COLLECTOR IS REFRACTORY LINE. THE OPERATING DESIGN PRESSURE IS 32.0/34.7 BARG. THE OPERATING TEMPERATURE FOR PROCESS GAS IS 742. THE OPERATING DESIGN TEMPERATURE FOR SHELL AFTER LINING IS 150/400.
  - 7) THE LINE IS IN THE SUPPLY SCOPE OF AP-2306 VENDOR.
  - 8) NEW STANDARD IS THREE THERMOWELLS ONE FOR EACH THERMOCOUPLE. (THREE INDIVIDUAL THERMOELEMENTS IN THE SAME THERMOWELL IS ACCEPTABLE IF ALREADY IMPLEMENTED)
  - 9) AIR DUCTING SIZE WILL BE CONFIRMED BY VENDOR FINALLY.
  - 10) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS.
  - 11) THE PIPE AND VALVE FOR PT-2282/2307/PG-2283/PDT-2283 ARE SUPPLIED BY PRIMARY REFORMER VENDOR.
  - 12) THE PIPE AND VALVE FOR AP-2294/2296 IS SUPPLIED BY PRIMARY REFORMER VENDOR.
- \*GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.


**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

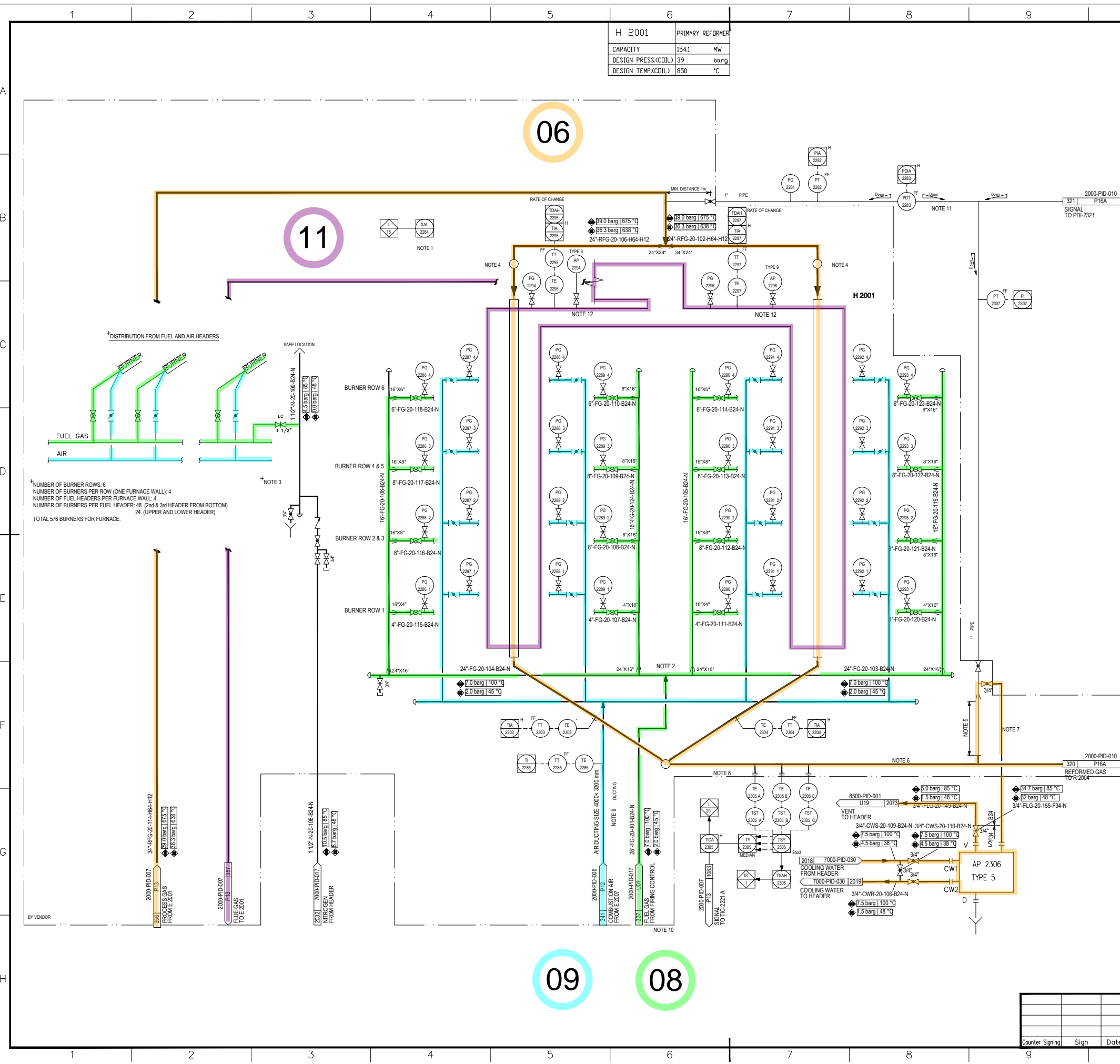
REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	30.12.2019	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	02.02.2018	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	06.11.2017	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	05.05.2017	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	22.03.2017	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	23.01.2017	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	10.11.2016	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	12.10.2016	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Approval for Construction	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkai		
▲	Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkai		

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OWNER:  Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	TUBULAR REFORMER PIPING AND INSTRUMENT DIAGRAM	PROJ NO	S-02115	CONV	42	REV.	4
DRAWING NO.	1341725	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-009	SHEET	01	TOTAL	01		
SUB-CONTRACTOR DRAWING NO.									
SHEET									

TUBULAR REFORMER PIPING AND INSTRUMENT DIAGRAM		PROJECT	MKP Methanol Project
		UNIT	Reformer
		PHASE	As Built Drawing
SCALE	SHEET:1	TOT:1	SIZE: A1
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-009		





07

R 2004	SECONDARY REFORMER
ID x LENGTH	5400 x 823mm
DESIGN PRESS.	34.7 barg
DESIGN TEMP.	400 °C
Insulation	YES
CLADDING/LINING	LINING

GENERAL NOTES

- \*NOTES:
- 1) SHELL TEMPERATURE MONITORING.
  - 2) TRANSMITTERS MUST BE INSTALLED ABOVE R 2004 WITH SLOPE BACK TO THE PROCESS. IMPULSE LINES MUST BE MIN. 1" PIPE.
  - 3) MIN 4 m INCOLOY 600 PIPE OF 1".
  - 4) NITROGEN REQUIRED AT THERMOWELL.
  - 5) WATER SPRAYING FOR SHELL COOLING IN CASE OF HOT SPOT TO OPEN DRAIN.
  - 6) COLD COLLECTOR IS REFRACTORY LINE. THE OPERATING/DESIGN PRESSURE IS 32.0/34.7 BARG. THE OPERATING TEMPERATURE FOR PROCESS GAS IS 742 °C. THE OPERATING/DESIGN TEMPERATURE FOR SHELL AFTER LINING IS 150/400 °C.
  - 7) P1 IS POSITIONED ON MANIFOLD TO E2020 1/2 (P1 IN PROCESS SPECIFICATION)
  - 8) THE SUPPLY SCOPE OF PRIMARY REFORMER VENDOR INSTRUMENTS ARE OUT OF VENDOR SUPPLY SCOPE IF NO SPECIAL INSTRUCTIONS
  - 9) THE PIPE AND VALVE FOR PT-2324/2322/PDT-2323/2321 ARE SUPPLIED BY PRIMARY REFORMER VENDOR
  - 10) MINIMUM DISTANCE TO SPE-0201
- \*GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

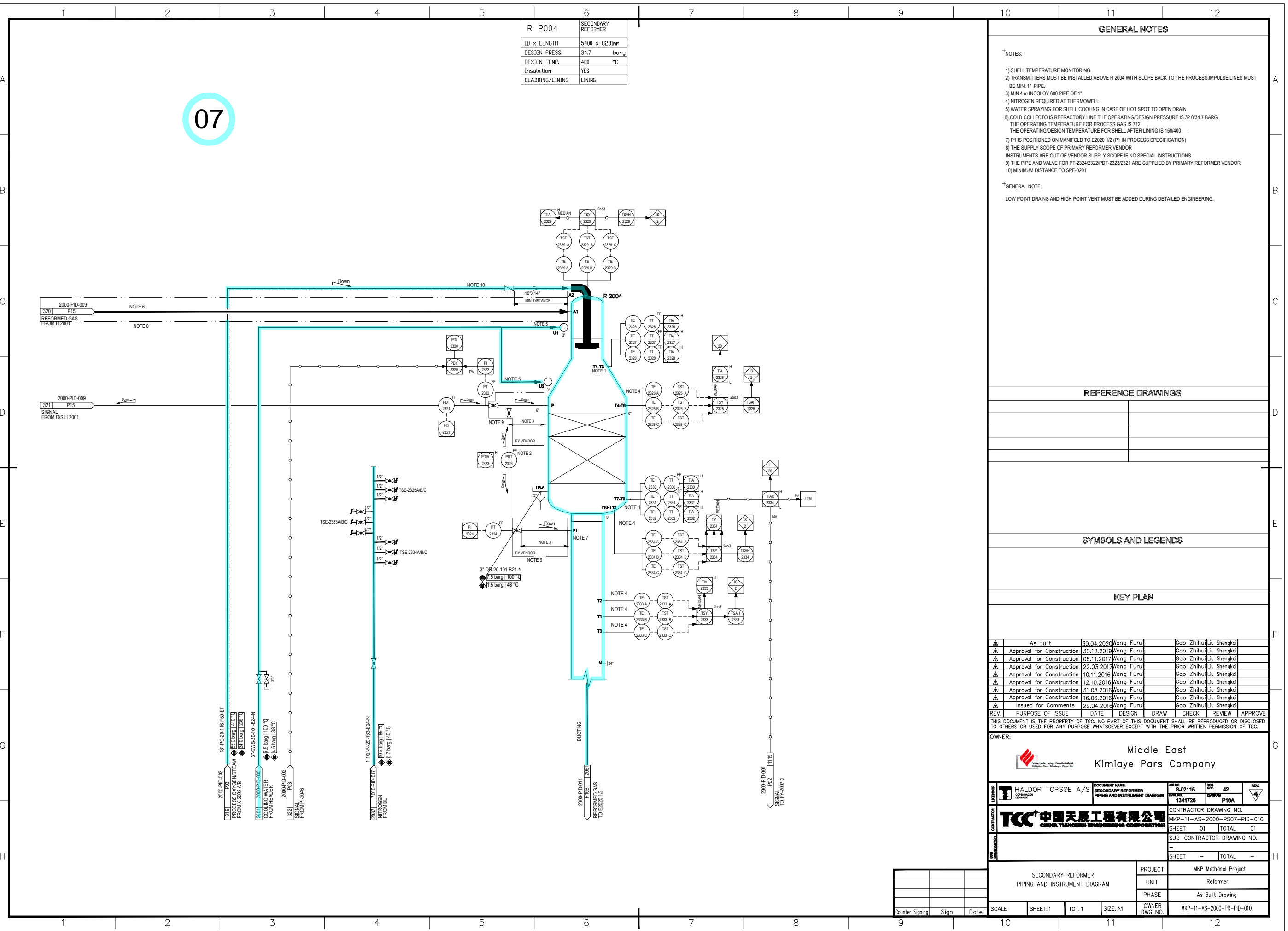
As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	30.12.2019	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	06.11.2017	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	22.03.2017	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	10.11.2016	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	12.10.2016	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkai
Approval for Construction	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkai
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkai

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OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	SECONDARY REFORMER PIPING AND INSTRUMENT DIAGRAM	DWG NO.	S-02115	REV.	4
DATE	13/4/2020	SCALE	P10A	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-010	SHEET	01
				TOTAL	01		
				SUB-CONTRACTOR DRAWING NO.			
				SHEET	01	TOTAL	01

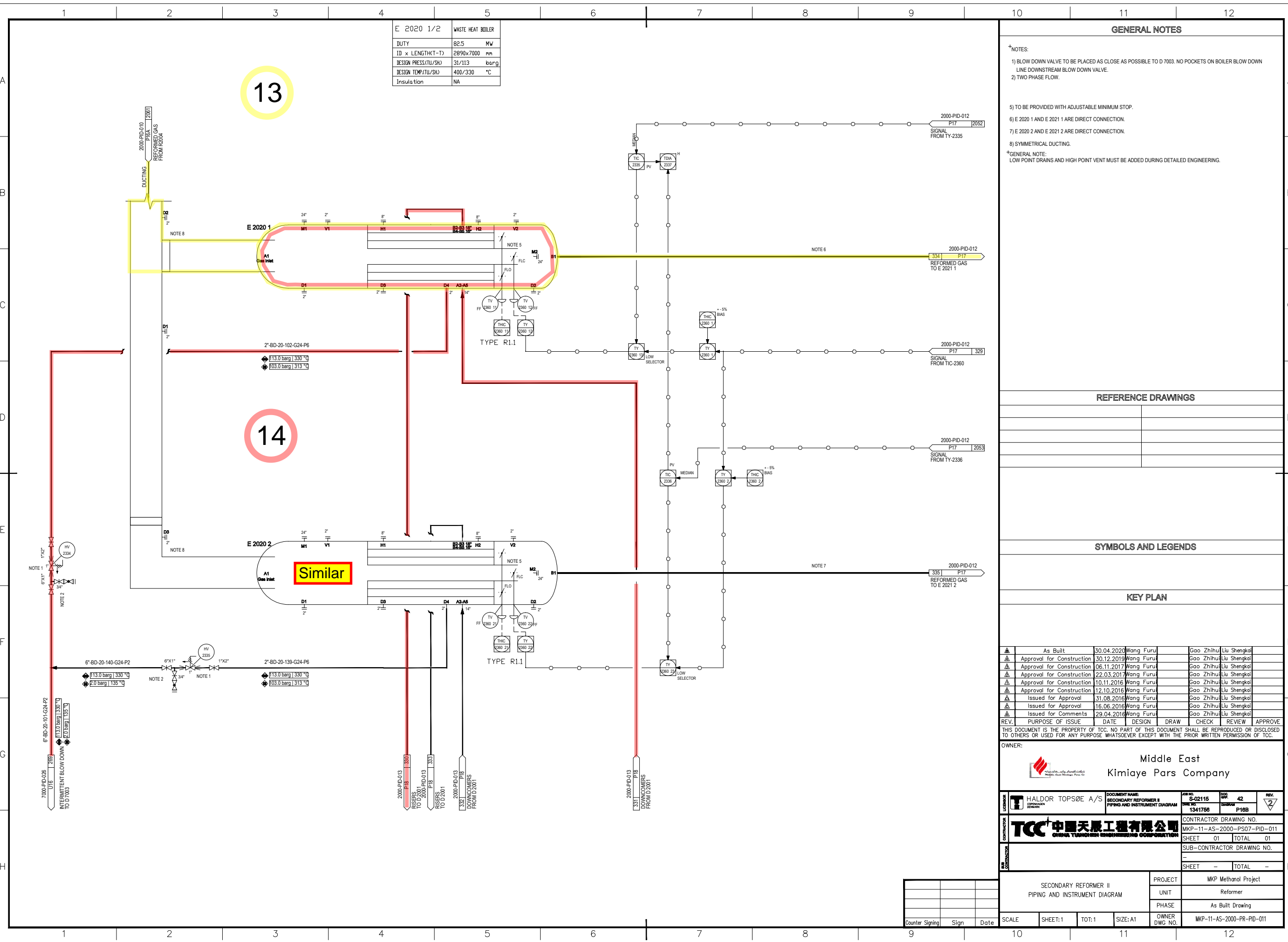
PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-010



E 2020 1/2	WASTE HEAT BOILER
DUTY	82.5 MW
ID x LENGTH-T	2890x7000 mm
DESIGN PRESS.(TL/SH)	31/113 barg
DESIGN TEMP.(TL/SH)	400/330 °C
Insulation	NA

13

14



GENERAL NOTES

- †NOTES:
- 1) BLOW DOWN VALVE TO BE PLACED AS CLOSE AS POSSIBLE TO D 7003. NO POCKETS ON BOILER BLOW DOWN LINE DOWNSTREAM BLOW DOWN VALVE.
  - 2) TWO PHASE FLOW.
  - 3) TO BE PROVIDED WITH ADJUSTABLE MINIMUM STOP.
  - 4) E 2020 1 AND E 2021 1 ARE DIRECT CONNECTION.
  - 5) E 2020 2 AND E 2021 2 ARE DIRECT CONNECTION.
  - 6) SYMMETRICAL DUCTING.
- †GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	30.12.2019	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	06.11.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	22.03.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	10.11.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	12.10.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Approval	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Approval	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkol

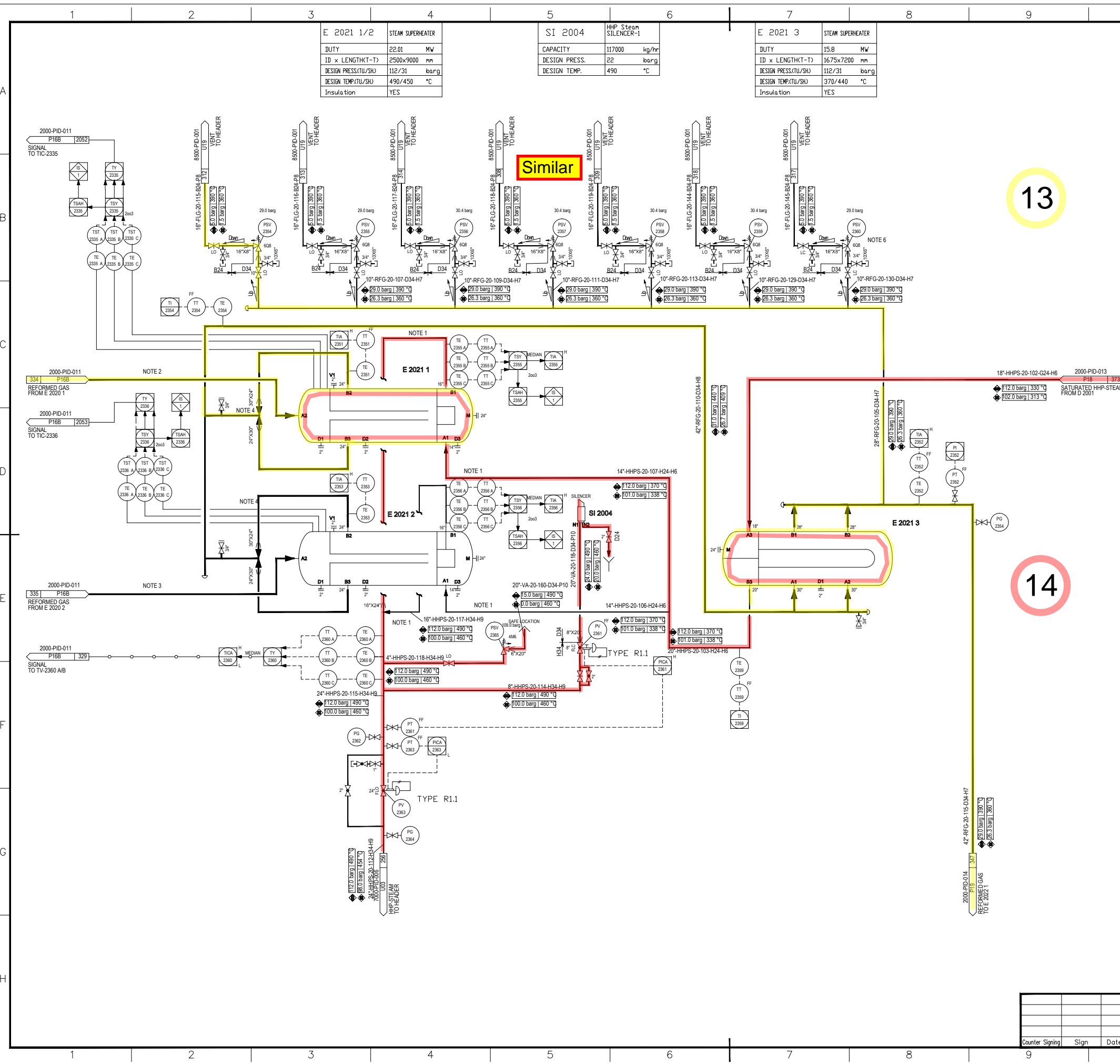
REV. PURPOSE OF ISSUE DATE DESIGN DRAW CHECK REVIEW APPROVE  
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OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	SECONDARY REFORMER II PIPING AND INSTRUMENT DIAGRAM	PROJ NO	S-02115	REV.	42
DRAWN		DATE	13/4/17	SCALE	P16B		
CONTRACTOR	TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-011	SHEET	01	TOTAL	01
CONTRIBUTOR		SUB-CONTRACTOR DRAWING NO.		SHEET		TOTAL	

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-011

Counter	Sign	Date



E 2021 1/2	STEAM SUPERHEATER
DUTY	22.01 MW
ID x LENGTH(T)-T	2500x9000 mm
DESIGN PRESS.(TL/SH)	112/31 barg
DESIGN TEMP.(TL/SH)	490/450 °C
Insulation	YES

SI 2004	HHP Steam SILENCER-1
CAPACITY	117000 kg/hr
DESIGN PRESS.	22 barg
DESIGN TEMP.	490 °C

E 2021 3	STEAM SUPERHEATER
DUTY	15.8 MW
ID x LENGTH(T)-T	1675x7200 mm
DESIGN PRESS.(TL/SH)	112/31 barg
DESIGN TEMP.(TL/SH)	370/440 °C
Insulation	YES

**GENERAL NOTES**

- \*NOTES:
- 1) SYMMETRICAL STEAM PIPING AROUND E 2021 1/2.
  - 2) E 2020 1 AND E 2021 1 ARE DIRECT CONNECTION.
  - 3) E 2020 2 AND E 2021 2 ARE DIRECT CONNECTION.
  - 4) SYMMETRICAL PIPING.
  - 5) VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - 6) THE FLANGE CLASS FOR INLET OF SAFETY-RELIEF VALVES PSV-2354-2360 SHOULD BE CL600 DIFFERING FROM PIPE.
- \*GENERAL NOTE:
- LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	05.05.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	22.03.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	23.01.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	10.11.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	12.10.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkol

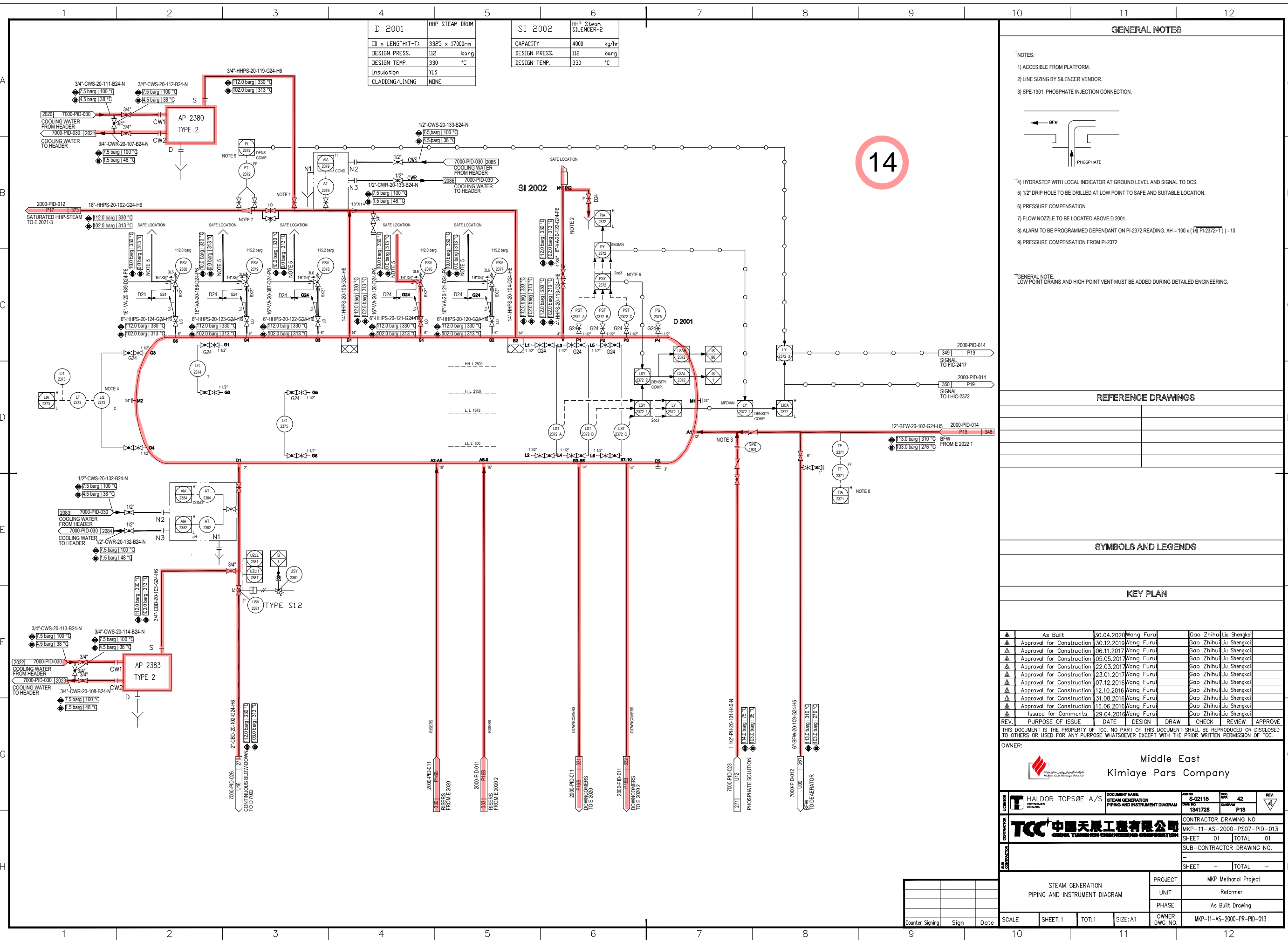
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OWNER:

**Middle East**  
**Kimiaye Pars Company**

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	STEAM SUPERHEATER PIPING AND INSTRUMENT DIAGRAM	PRO NO.	S-02115	REV.	4
DATE	13/04/2022	SCALE	P17	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-012		
				SHEET	01	TOTAL	01
				SUB-CONTRACTOR DRAWING NO.			
				SHEET	-	TOTAL	-

STEAM SUPERHEATER PIPING AND INSTRUMENT DIAGRAM		PROJECT	MKP Methanol Project
		UNIT	Reformer
		PHASE	As Built Drawing
SCALE	SHEET:1	TOT:1	SIZE: A1
COUNTER SIGNING	SIGN	DATE	OWNER DWG NO. MKP-11-AS-2000-PR-PID-012



D 2001	HP Steam Drum	SI 2002	HP Steam Silencer-2
ID x LENGTH(T-D)	3325 x 17000mm	CAPACITY	4000 kg/hr
DESIGN PRESS.	112 barg	DESIGN PRESS.	112 barg
DESIGN TEMP.	330 °C	DESIGN TEMP.	330 °C
Insulation	YES		
CLADDING/LINING	NONE		

**GENERAL NOTES**

- NOTES:
- 1) ACCESSIBLE FROM PLATFORM.
  - 2) LINE SIZING BY SILENCER VENDOR.
  - 3) SPE-1901: PHOSPHATE INJECTION CONNECTION.
- 
- 4) HYDRATEST WITH LOCAL INDICATOR AT GROUND LEVEL AND SIGNAL TO DCS.
  - 5) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - 6) PRESSURE COMPENSATION.
  - 7) FLOW NOZZLE TO BE LOCATED ABOVE D 2001.
  - 8) ALARM TO BE PROGRAMMED DEPENDANT ON PI-2372 READING:  $AH = 100 \times (\sqrt{(PI-2372+1)}) - 10$
  - 9) PRESSURE COMPENSATION FROM PI-2372
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**

2000-PID-012	18"-HHPS-20-102-G24-H6	2000-PID-014	348 P19
2000-PID-012	18"-HHPS-20-102-G24-H6	2000-PID-014	350 P19
2000-PID-012	18"-HHPS-20-102-G24-H6	2000-PID-014	348 P19
2000-PID-012	18"-HHPS-20-102-G24-H6	2000-PID-014	350 P19

**SYMBOLS AND LEGENDS**

**KEY PLAN**

As Built	30.04.2020	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	30.12.2019	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	06.11.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	05.05.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	22.03.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	23.01.2017	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	07.12.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	12.10.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	31.08.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Approval for Construction	16.06.2016	Wang Furu	Gao Zhihu	Liu Shengkol
Issued for Comments	29.04.2016	Wang Furu	Gao Zhihu	Liu Shengkol

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OWNER: Middle East Kimiaye Pars Company

OWNER	HALDOR TOPSØE A/S	DOCUMENT NAME	STEAM GENERATION PIPING AND INSTRUMENT DIAGRAM	PRO NO	S-02115	REV	4
CONTRACTOR	TCC 中国天辰工程有限公司	DATE	13/4/2020	CONTRACTOR DRAWING NO.	1341728	SHEET	01
PROJECT	MKP-11-AS-2000-PS07-PID-013	TOTAL	01	SUB-CONTRACTOR DRAWING NO.			
		SHEET		TOTAL			

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-013

E 2022 1	BFW Preheater
DUTY	34.8 MW
ID x LENGTH(T)	1450x10000 mm
DESIGN PRESS.(TLU/SH)	113/29 barg
DESIGN TEMP.(TLU/SH)	310/390 °C
Insulation	YES

E 2022 2/3	BFW Preheater
DUTY	41.6 MW
ID x LENGTH(T)	1450x10000 mm
DESIGN PRESS.(TLU/SH)	113/29 barg
DESIGN TEMP.(TLU/SH)	310/280 °C
Insulation	YES

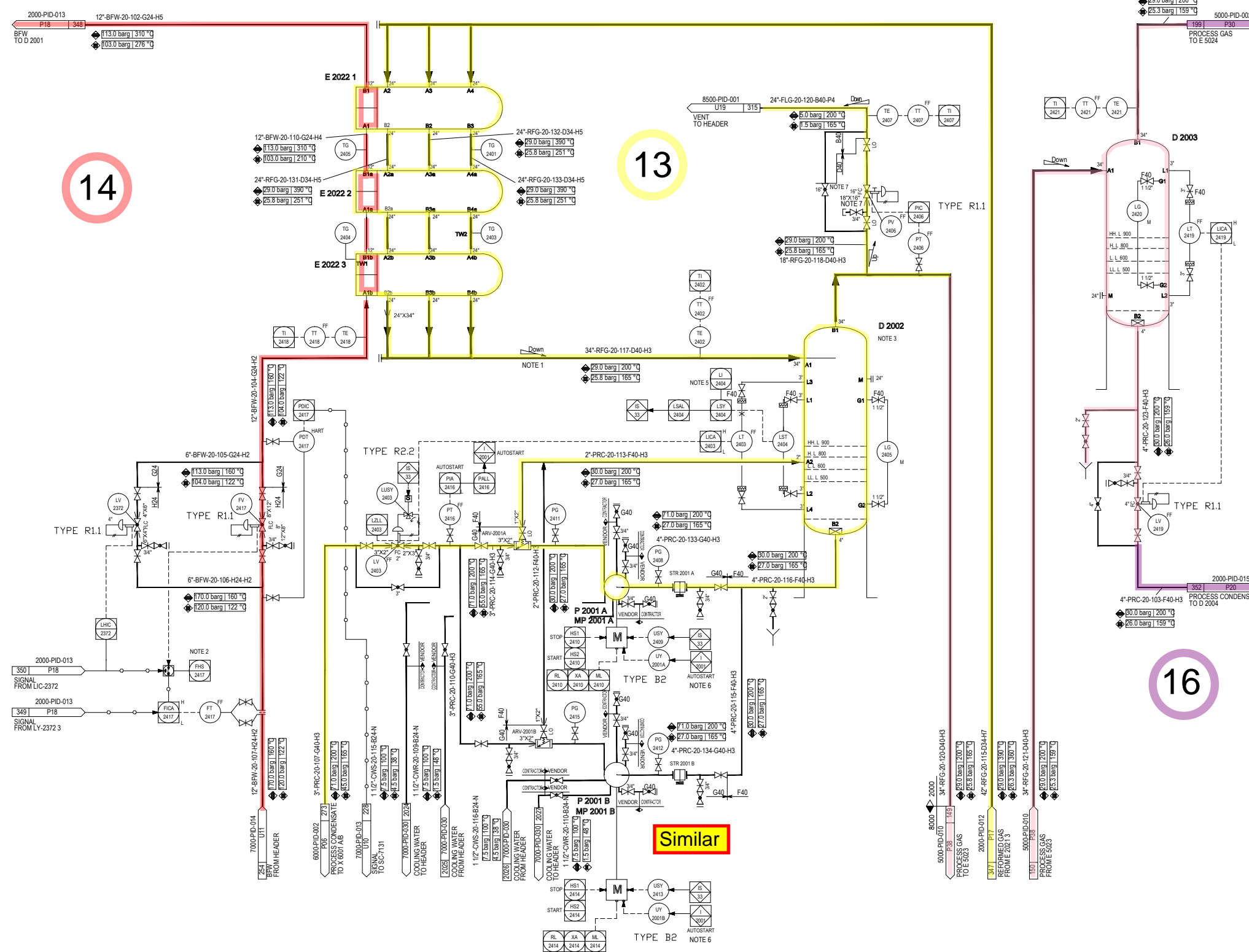
P 2001 A/B	PROCESS CONDENSATE PUMP ND1
CAPACITY	32.3 m <sup>3</sup> /h
HEAD	274.3 m
DENSITY	903 kg/m <sup>3</sup>
INSULATION/TRACING	YES
AUXILIARY PIPING	By Vendor

D 2002	1st SEPARATOR
ID x LENGTH(T)	3750 x 4850 mm
DESIGN PRESS.	29 barg
DESIGN TEMP.	200 °C
Insulation	YES
CLADDING/LINING	NONE
Elevation of Equipment	EL +103.54m

D 2003	2nd SEPARATOR
ID x LENGTH(T)	3650 x 4750 mm
DESIGN PRESS.	29 barg
DESIGN TEMP.	200 °C
Insulation	YES
CLADDING/LINING	NONE

**GENERAL NOTES**

- NOTES:
- TWO PHASE FLOW.
  - SWITCHING BY FHS-2417 (SYMBOLIC INDICATED) FROM 3-ELEMENT LEVEL CONTROL VIA FIC-2417 TO SINGLE ELEMENT LEVEL CONTROL IS DONE WITH AUTOMATIC CHANGE OF TUNING CONSTANTS IN LIC-2372.
  - NOZZLE B2 ON D2002 MUST BE LOCATED MIN. 1.5 m ABOVE P 2001 AB TO BE CONFORMED BY PUMP VENDOR.
  - VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - MOUNT ON STANDPIPE OR BRIDLE. ALTERNATIVELY ADD A SET OF NOZZLES (ONE SET FOR EACH LT-).
  - PIA-2416 LOW PRESSURE THEN I-2001 WORK MAKE STAND-BY PUMP AUTOSTART.
  - PV-2406 INCLUDES 3 NOISE REDUCTION DISKS, THE SIZE IS 16"24" AND THE REDUCER CONSIDERED BY PIPING.
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.



14

13

15

16

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	30.12.2019	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	06.11.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	05.05.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	22.03.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	23.01.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	10.11.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	12.10.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Issued for Approval	31.08.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Issued for Approval	16.06.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Issued for Comments	29.04.2016	Wang Furu			Gao Zhihu	Liu Shengkol

OWNER: Middle East Kimiaye Pars Company

CONTRACTOR: HALDOR TOPSØE A/S

PROJECT: GAS COOLING AND SEPARATION I PIPING AND INSTRUMENT DIAGRAM

CONTRACTOR DRAWING NO. 1341728

SHEET 01 TOTAL 01

SCALE: SHEET:1 TOT:1 SIZE: A1

PROJECT: MKP Methanol Project

UNIT: Reformer

PHASE: As Built Drawing

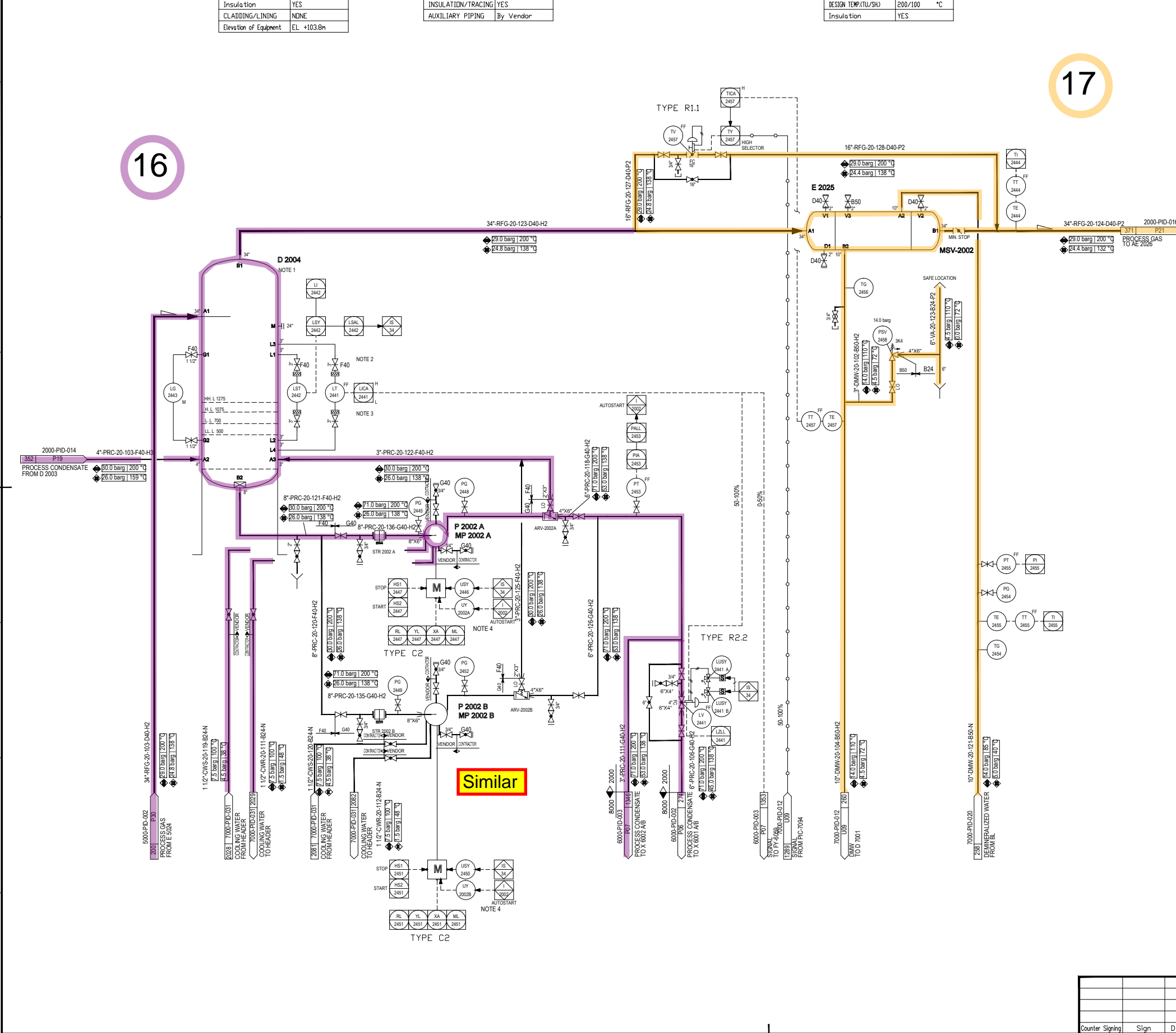
OWNER DWG NO. MKP-11-AS-2000-PR-PID-014

16

17

D 2004	3rd SEPARATOR	P 2002 A/B	PROCESS CONDENSATE PUMP NO.2
ID x LENGTH(T)	3350 x 4825 mm	CAPACITY	116.5 m <sup>3</sup> /h
DESIGN PRESS.	29 barg	Head	279.9 m
DESIGN TEMP.	200 °C	DENSITY	928 kg/m <sup>3</sup>
Insulation	YES	INSULATION/TRACING	YES
CLADDING/LINING	NONE	AUXILIARY PIPING	By Vendor
Elevation of Equipment	EL +103.8m		

E 2025	DMW PREHEATER
DUTY	9.4 MW
ID x LENGTH(T)	1000x1800 mm
DESIGN PRESS.(TLU/SH)	29/14 barg
DESIGN TEMP.(TLU/SH)	200/100 °C
Insulation	YES



**GENERAL NOTES**

†NOTES:  
 1) NOZZLE B2 ON D 2004 MUST BE LOCATED MIN 1.5m ABOVE P2002 AB. TO BE CONFIRMED BY PUMP VENDOR.  
 2) MOUNT ON STANDPIPE OR BRIDLE. ALTERNATIVELY ADD A SET OF NOZZLES (ONE SET FOR EACH LT-).  
 3) FUNCTION OF LIC-2441

4) PIA2453 LOW PRESSURE THEN I-2002 WORK MAKE STAND-BY PUMP AUTOSTART.

†GENERAL NOTE:  
 LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**


**SYMBOLS AND LEGENDS**

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	30.12.2019	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	06.11.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	05.05.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	22.03.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	23.01.2017	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	10.11.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	12.10.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	31.08.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Approval for Construction	16.06.2016	Wang Furu			Gao Zhihu	Liu Shengkol
▲	Issued for Comments	29.04.2016	Wang Furu			Gao Zhihu	Liu Shengkol

OWNER: Middle East Kimiaye Pars Company

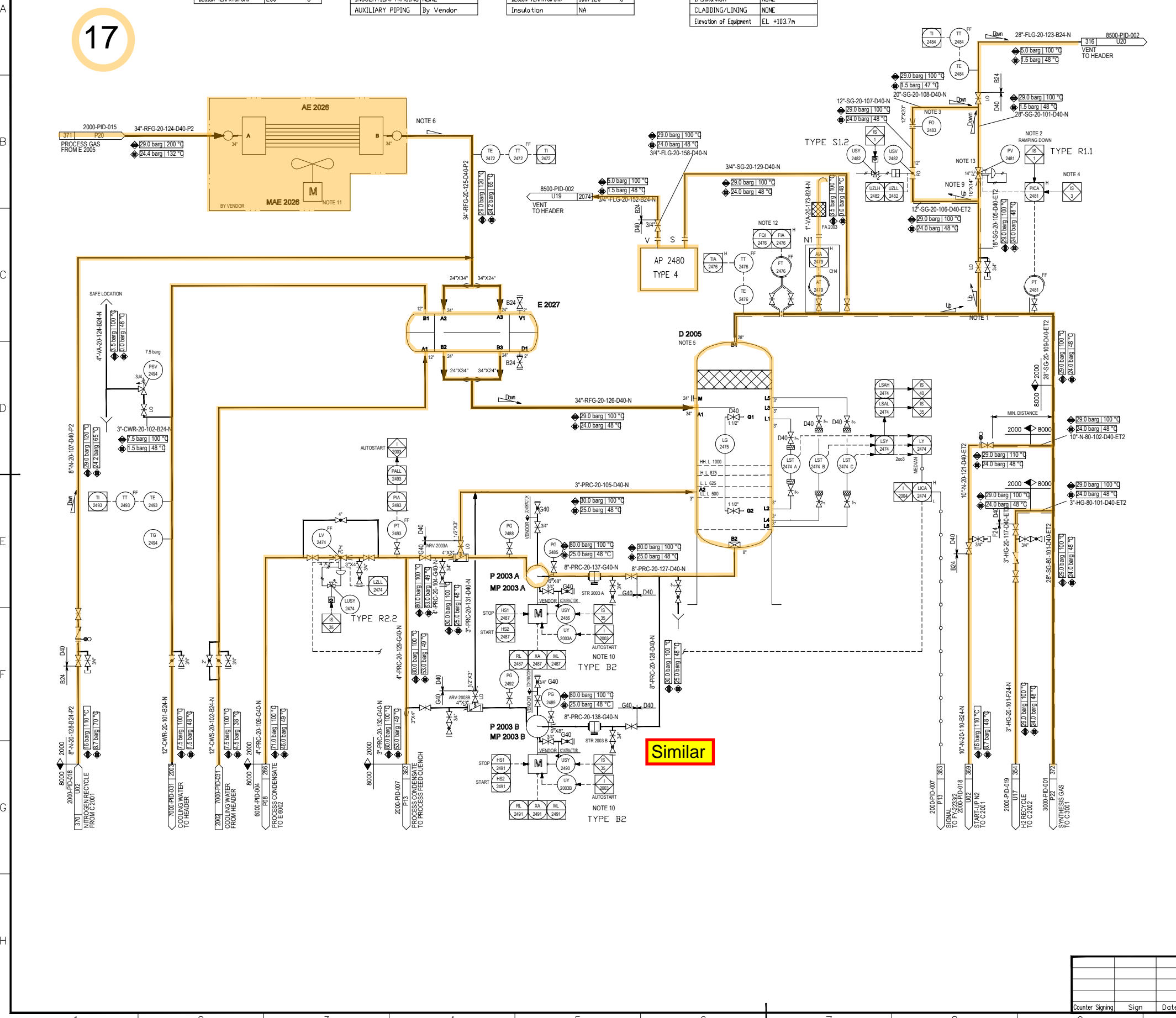
DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	GAS COOLING AND SEPARATION II PIPING AND INSTRUMENT DIAGRAM	PRO NO.	S-02115	CONV.	42	REV.	1
CONTRACTOR	TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-015	SHEET NO.	1341730	STATUS	P20	TOTAL	01
		SUB-CONTRACTOR DRAWING NO.							
		SHEET	01	TOTAL	01				

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG. NO.	MKP-11-AS-2000-PR-PID-015

Counter			
Sign			
Date			

17

AE 2026	AIR COOLER	P 2003 A/B	PROCESS CONDENSATE PUMP NO.3	E 2027	WATER COOLER	D 2005	FINAL SEPARATOR
DUTY	51.3 MW	CAPACITY	83 m <sup>3</sup> /h	DUTY	6.5 MW	ID x LENGTH(T)-D	3500 x 4825 mm
ID x LENGTH(T)-D	BY VENDOR mm	Head	351 n	ID x LENGTH(T)-D	1400x10000 mm	DESIGN PRESS.	29 barg
DESIGN PRESS.(TLU/SH)	29 barg	DENSITY	989 kg/m <sup>3</sup>	DESIGN PRESS.(TLU/SH)	7.5/29 barg	DESIGN TEMP.	100 °C
DESIGN TEMP.(TLU/SH)	200 °C	INSULATION/TRACING	NONE	DESIGN TEMP.(TLU/SH)	100/120 °C	Insulation	NONE
		AUXILIARY PIPING	By Vendor	Insulation	NA	CLADDING/LINING	NONE
				Elevation of Equipment	EL +103.7m		



- GENERAL NOTES**
- TOP EXIT CONNECTION.
  - CONTROLLER TO AUTO WHEN SIGNAL FROM IS-1. SETPOINT EQUAL TO PROCESS VALUE BEFORE TRIP. SETPOINT MUST BE RAMPED DOWN TO 3 barg OVER 10 min.
  - PRESSURE TO BE HALVED EVERY 4 MINUTES OF DEPRESSURISATION.
  - IS-3 TO PUT CONTROLLER IN MANUAL OPEN VALVE TO AN OPENING CORRESPONDING TO THE FLOW AT TIME OF TRIP THEN PIC-2481 IS PUT IN AUTO WITH SET POINT EQUAL TO ACTUAL PRESSURE AT TIME OF TRIP.
  - D 2005 TO BE LOCATED CLOSE TO C 3001. NOZZLE B2 ON D 2005 MUST BE LOCATED MIN 1.5m ABOVE P 2003 A/B. TO BE CONFIRMED BY PUMP VENDOR.
  - TW IS TO BE INSTALLED ON EACH OUTLET HEADER FROM AE 2026.
- VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - PIA2493 LOW PRESSURE THEN I-2003 WORK MAKE STAND-BY PUMP AUTOSTART.
  - DETAIL DRAWING FOR AE 2026 PLEASE SEE MKP-11-DE-2000-PR-PID-020
  - P&T COMPENSATION FROM PI-2481, TI-2476
  - PV-2481 INCLUDES 3 NOISE REDUCTION DISKS, THE SIZE IS 16"-28" AND THE REDUCER CONSIDERED BY PIPING.

GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**


**SYMBOLS AND LEGENDS**

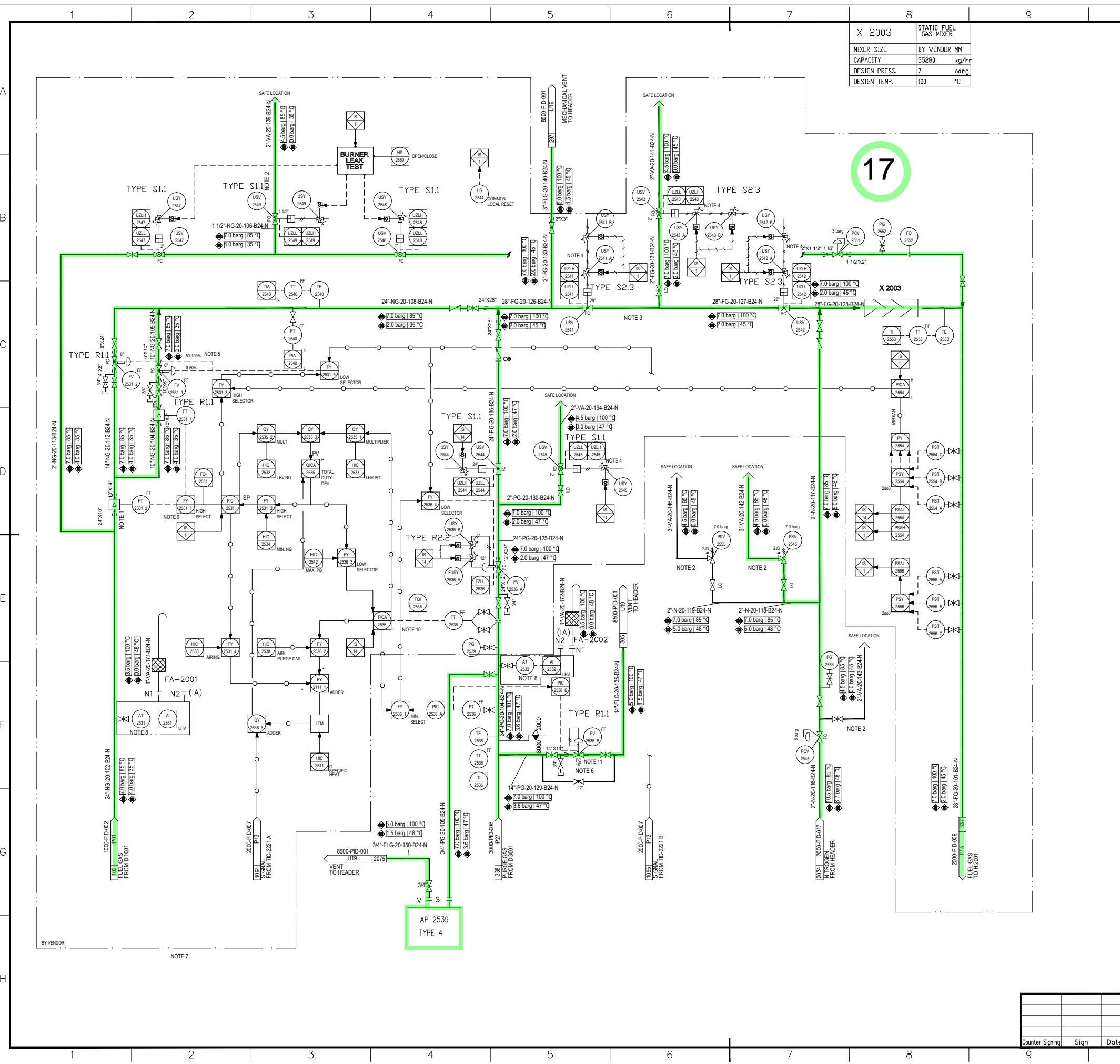

**KEY PLAN**

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	28.12.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Review	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Review	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	GAS COOLING AND SEPARATION III PIPING AND INSTRUMENT DIAGRAM	NO. S-02115	REV. 42
DRAWN		DATE		1341731	P21
CONTRACTOR	TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION				
CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS07-PID-016				
SHEET	01	TOTAL	01		
SUB-CONTRACTOR DRAWING NO.					
SHEET		TOTAL			
GAS COOLING AND SEPARATION III PIPING AND INSTRUMENT DIAGRAM			PROJECT	MKP Methanol Project	
			UNIT	Reformer	
			PHASE	As Built Drawing	
			OWNER DWG NO.	MKP-11-AS-2000-PR-PID-016	
SCALE	SHEET:1	TOT:1	SIZE: A1		

Similar



X 2003	STATIC FUEL GAS MIXER
MIXER SIZE	BY VENDOR MM
CAPACITY	55280 kg/hr
DESIGN PRESS.	7 barg
DESIGN TEMP.	100 °C

**GENERAL NOTES**

- NOTES:
- MIN. DISTANCE BETWEEN FT-2531 AND PV-1011: 10 meter ALTERNATIVE INCREASE PIPE DIAMETER TO ACHIEVE IDENTICAL GAS VOLUME. REQUIREMENTS OF FLOW MEASURING EQUIPMENT MUST ALSO BE CONSIDERED.
  - 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - DISTANCE TO FURNACE TO BE MINIMIZED.
  - SOLENOID VALVES TO BE IN 2oo2d CONFIGURATION FOR SAFETY AND AVAILABILITY.
  -
- 
- VALVE OPENING, %
- OUTPUT, %  
FY-2531-5
- VALVE SIZE WILL BE CONFIRMED BY VENDOR.
  - THE DESIGN SCOPE OF PRIMARY REFORMER VENDOR
  - WHEN THERE IS NO INSTRUMENT AIR SUPPLY FOR THE ANALYZER AT-2531/AT-2532, THE LAST EFFECTIVE DATA SHALL BE RECORDED IN FCS.
  - P&T COMPENSATION FROM PIC-1011, TI-1012
  - P&T COMPENSATION FROM PIC-2536A, TI-2536
  - PV-2536B includes 1 noise reduction disks, the size is 14" and the reducer considered by piping.
- GENERAL NOTE:  
LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

**REFERENCE DRAWINGS**

**SYMBOLS AND LEGENDS**

**KEY PLAN**

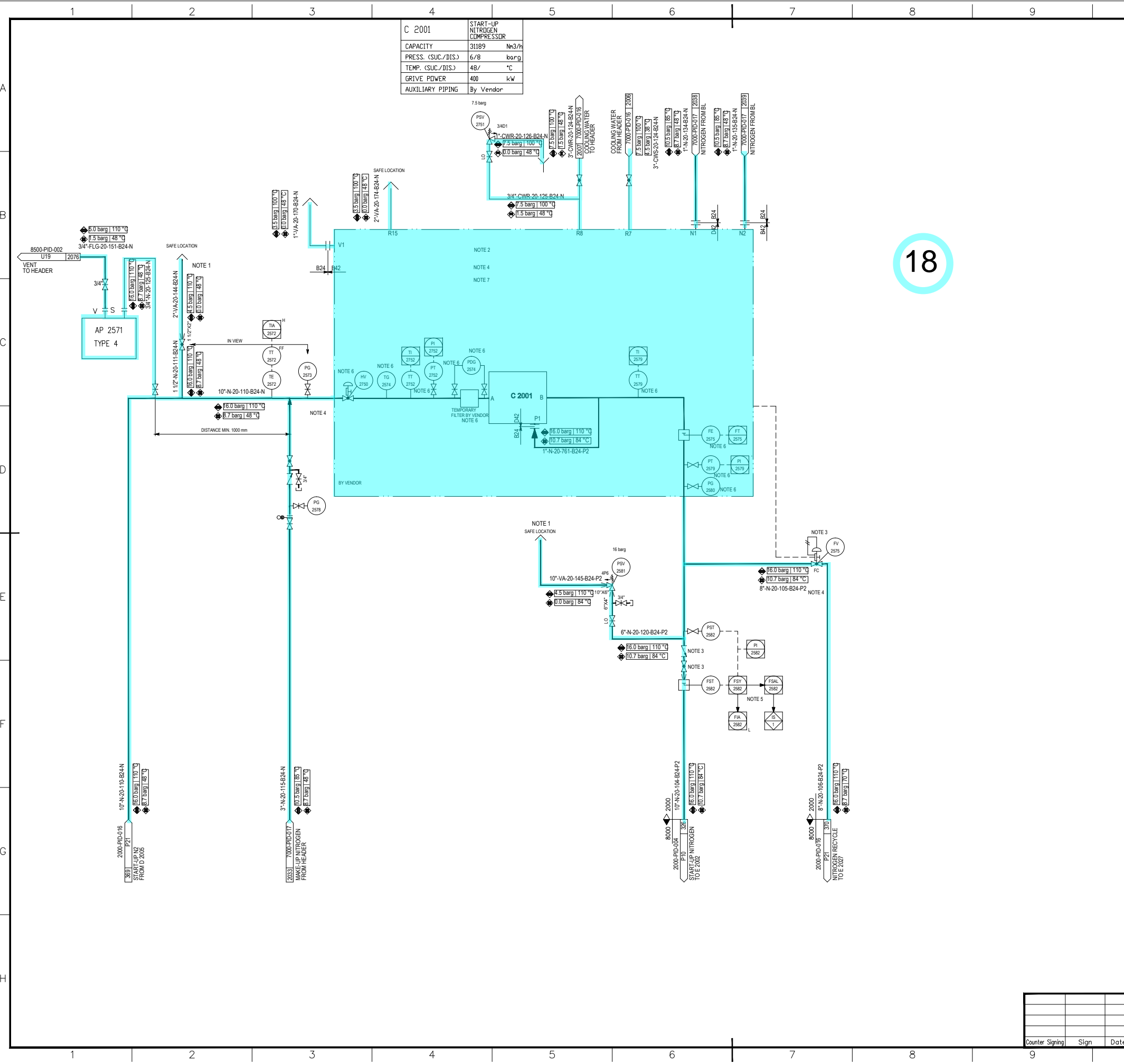
REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

OWNER: Middle East Kimiaye Pars Company

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	FUEL SYSTEM PIPING AND INSTRUMENT DIAGRAM	JOB NO.	S-02115	REV.	4
DRAWN		DATE		1341757		U01	
CONTRACTOR	TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION						
CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS09-PID-001						
SHEET	01	TOTAL	01				
SUB-CONTRACTOR DRAWING NO.							
SHEET			TOTAL				

FUEL SYSTEM PIPING AND INSTRUMENT DIAGRAM	PROJECT	MKP Methanol Project
	UNIT	Reformer
	PHASE	As Built Drawing
SCALE	SHEET:1	TOT:1
SIZE: A1	OWNER	MKP-11-AS-2000-PR-PID-017
Counter Signing	Sign	Date





18

GENERAL NOTES

- \*NOTES:
- 1) 1/2" DRIP HOLE TO BE DRILLED AT LOW POINT TO SAFE AND SUITABLE LOCATION.
  - 2) DETAILS BY VENDOR.
  - 3) THE FV-2575 BLOCK VALVE AND CHECK VALVE WILL BE SUPPLIED BY C 2001 VENDOR LOOSE.
  - 4) THE PROCESS NITROGEN PIPE CONNECTING WITH INLET AND OUTLET OF C 2001 IS SUPPLIED BY TCC
  - 5) PRESSURE COMPENSATION FROM PT-2582.
  - 6) THE TEMPERATURE INDICATOR/GAUGE (TG-2574/TI-2752/2579), THE PRESSURE INDICATOR/GAUGE (PT-2752/PT-2579/PC-2580), THE FLOWMETER/FT-2575, THE DIFFERENTIAL PRESSURE GAUGE (PDG-2574) AND TEMPORARY FILTER ARE SUPPLIED BY C2001 VENDOR.
  - 7) PLEASE FIND VENDOR DOCUMENT FOR DETAILS.
- \*GENERAL NOTE:
- LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	02.02.2018	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

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Kimiaye Pars Company

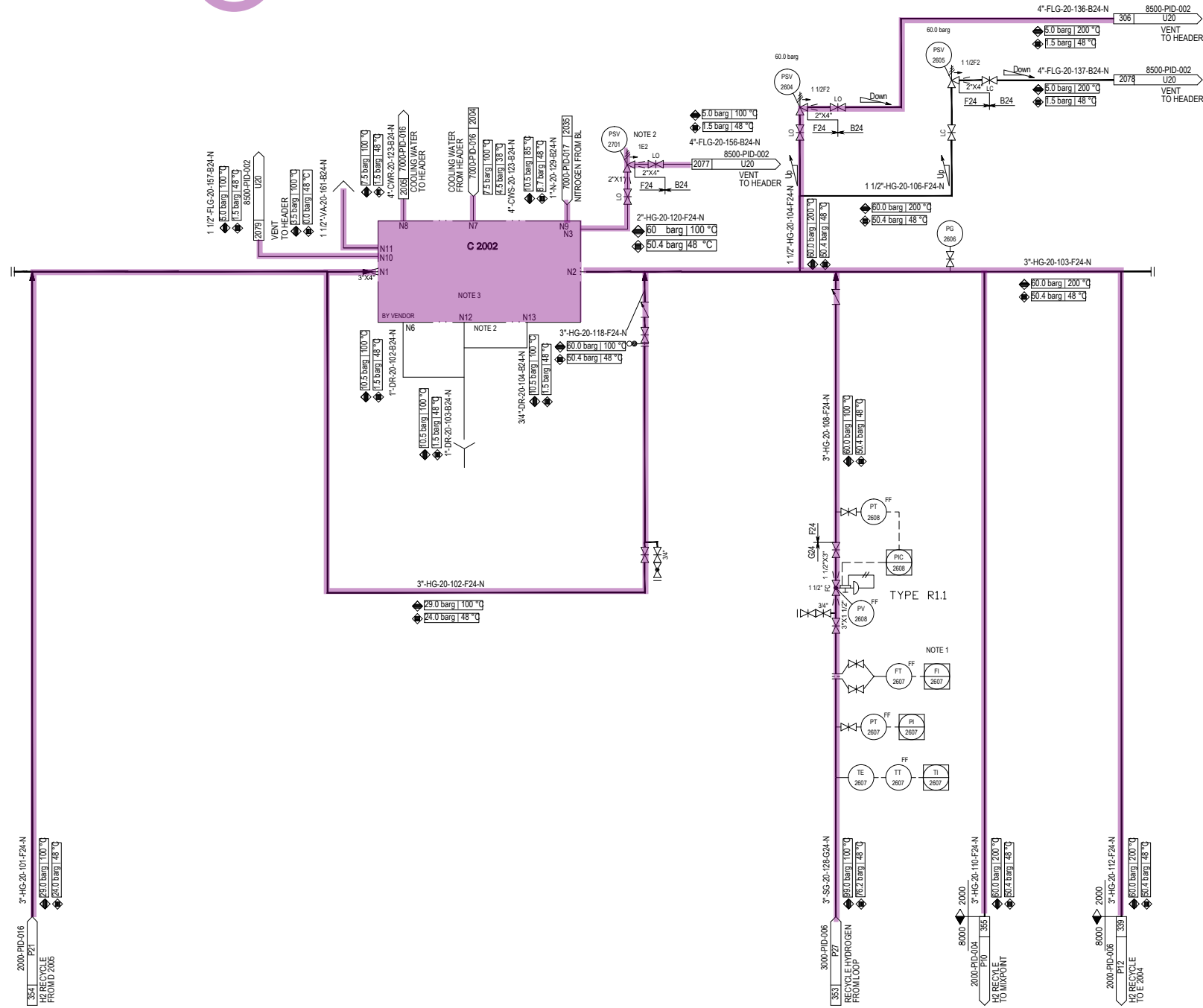
DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	START-UP BLOWER PIPING AND INSTRUMENT DIAGRAM	JOB NO.	S-02115	CDR NO.	42	REV.	3	
CONTRACTOR	TCC 中国天辰工程有限公司	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS09-PID-002	DWG NO.	1341758	ISSUE NO.	U02			
		SUB-CONTRACTOR DRAWING NO.				SHEET		01	TOTAL	01
		SHEET				SHEET		-	TOTAL	-

PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-018

SCALE	SHEET:1	TOT:1	SIZE: A1
Counter Signing	Sign	Date	

19

C 2002	HYDROGEN RECYCLE COMPRESSOR
CAPACITY	5078 Nm <sup>3</sup> /h
PRESS. (SUC./DIS.)	24/50.4 barg
TEMP. (SUC./DIS.)	48/ °C
DRIVE POWER	200 kW
AUXILIARY PIPING	By Vendor



GENERAL NOTES

- \*NOTES:
- 1) P&T COMPENSATION FROM PI-2607, TI-2607
  - 2) PSV-2701 IS SUPPLIED BY C2002 VENDOR
  - 3) PLEASE FIND VENDOR DOCUMENT FOR DETAILS.
- +GENERAL NOTE:
- LOW POINT DRAINS AND HIGH POINT VENT MUST BE ADDED DURING DETAILED ENGINEERING.

REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	30.12.2019	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	02.02.2018	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	06.11.2017	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	10.11.2016	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Approval for Construction	16.06.2016	Wang Furu		Gao Zhihu	Liu Shengke	
▲	Issued for Comments	29.04.2016	Wang Furu		Gao Zhihu	Liu Shengke	

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OWNER:

**Middle East  
Kimiaye Pars Company**

DESIGNER	HALDOR TOPSØE A/S	DOCUMENT NAME	H2 RECYCLE SYSTEM PIPING AND INSTRUMENT DIAGRAM	PROJ NO	S-02115	REV.	42
DRAWN		DATE		DWG NO	1341773	STATUS	U17
CONTRACTOR	<b>TCC 中国天辰工程技术有限公司</b>	CONTRACTOR DRAWING NO.	MKP-11-AS-2000-PS09-PID-003				
		SHEET	01	TOTAL	01		
		SUB-CONTRACTOR DRAWING NO.					
		SHEET	-	TOTAL	-		

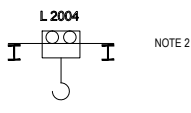
PROJECT	MKP Methanol Project
UNIT	Reformer
PHASE	As Built Drawing
OWNER DWG NO.	MKP-11-AS-2000-PR-PID-019

Counter	Sign	Date

17

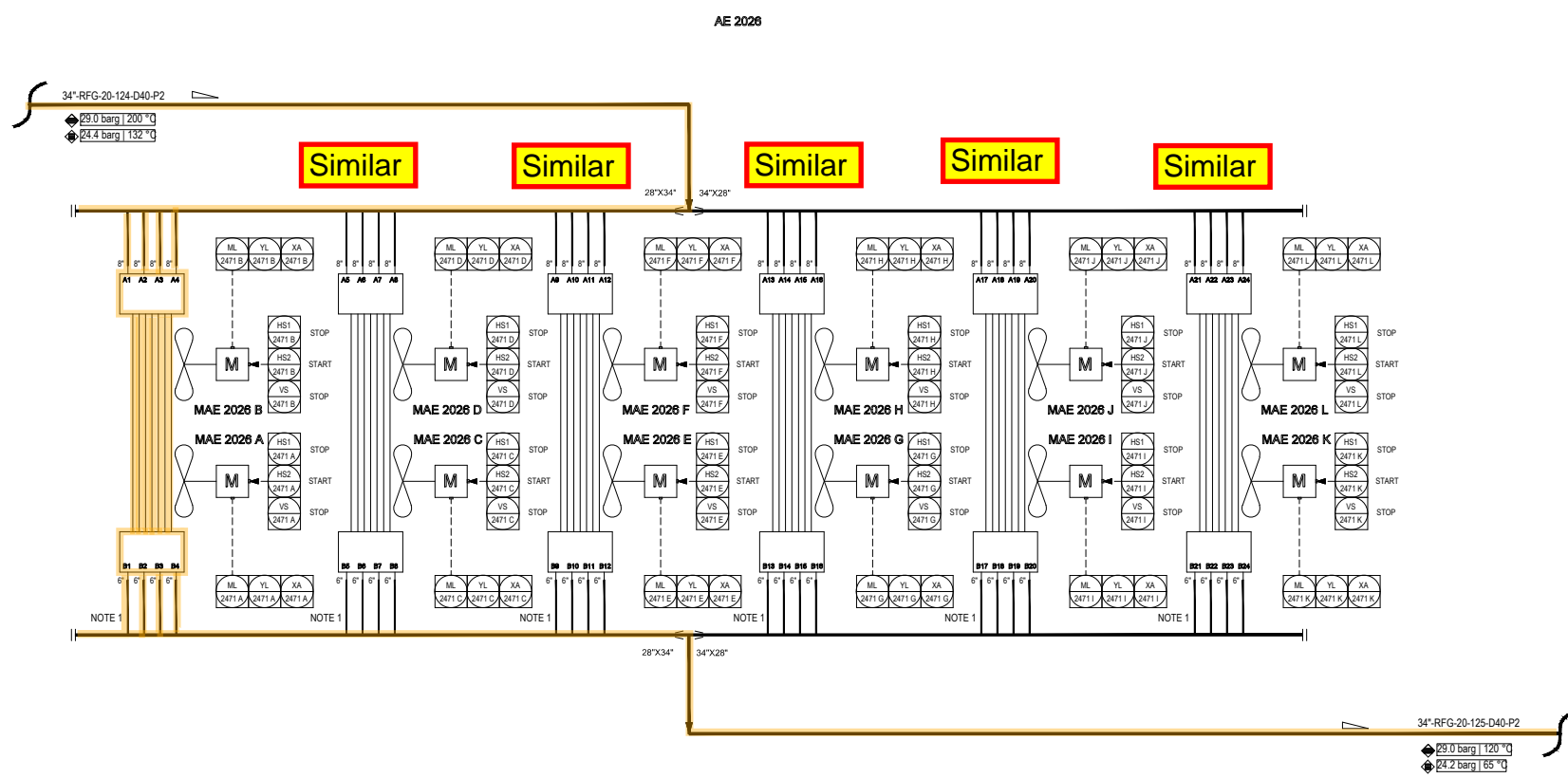
L 2004	CANTILEVER CRANE
TYPE	COLUMN CANTILEVER
CAPACITY	1 t
LIFT HEIGHT	20 m
SLIDING DISTANCE	1.8 m

AE 2026	AIR COOLER
DUTY	51.3 MW
ID x LENGTH(T-D)	BY VENDOR mm
DESIGN PRESS.(TLU/SH)	29 barg
DESIGN TEMP.(TLU/SH)	200 °C



GENERAL NOTES

- \*NOTES:
- 1) THERMOWELL LABEL IS SHOWN BELOW (ONE TW FOR EACH TUBE BOX OUTLET):
- |                                     |
|-------------------------------------|
| MAE2026A MAE2026B MAE2026G MAE2026H |
| B1 TW2473A B13 TW2473G              |
| B3 TW2473B B15 TW2473H              |
| MAE2026C MAE2026D MAE2026E MAE2026J |
| B5 TW2473C B17 TW2473I              |
| B7 TW2473D B19 TW2473J              |
| MAE2026K MAE2026F MAE2026L MAE2026M |
| B9 TW2473E B21 TW2473K              |
| B11 TW2473F B23 TW2473L             |
- 2) CANTILEVER CRANE IS USED FOR AE-2026 MAINTENANCE.



REFERENCE DRAWINGS

SYMBOLS AND LEGENDS

KEY PLAN

REV.	PURPOSE OF ISSUE	DATE	DESIGN	DRAW	CHECK	REVIEW	APPROVE
▲	As Built	30.04.2020	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	05.05.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	22.03.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Approval for Construction	23.01.2017	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Review	28.12.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Review	12.10.2016	Wang Furu		Gao Zhihu	Liu Shengkol	
▲	Issued for Comments	31.08.2016	Wang Furu		Gao Zhihu	Liu Shengkol	

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OWNER: Middle East Kimiaye Pars Company

CONTRACTOR	DOCUMENT NAME	JOB NO.	SCALE	REV.
TCC 中国天辰工程有限公司 CHINA TIANCHEN ENGINEERING CORPORATION				
CONTRACTOR DRAWING NO.		REV.		
MKP-11-AS-2000-PS07-PID-017		01		
SHEET 01		TOTAL 01		
SUB-CONTRACTOR DRAWING NO.		REV.		
SHEET --		TOTAL --		

PROJECT		MKP Methanol Project	
UNIT		Reformer	
PHASE		As Built Drawing	
OWNER DWG NO.		MKP-11-AS-2000-PR-PID-020	

Counter	Sign	Date