TOP PROJECT NO. :

CTCI PROJECT NO. :

HAZOP STUDY REPORT
EPC MAIN WORK
FOR
CFP CRUDE OIL TANK PROJECT

FOR FINAL

						Thai Oil Public Company Limited
						CERTIFIED
0	Issue For Final					PROJ.
Z0	Issue For Design					MGR. DATE
A	Issue For Review					
REV.	DESCRIPTION	BY	CHK.	APPR.	DATE	Rev. 0

วัตถุประสงค์การศึกษาและขอบเขตงาน (Study Objective and Work Scope)

รายชื่อผู้เข้าร่วม (Attendee list)													
No.	Name	Company	Date of attendance										
			1 Mar 23	2 Mar 23	3 Mar 23	4 Mar 23	5 Mar 23	6 Mar 23	7 Mar 23	8 Mar 23	9 Mar 23	10 Mar 23	11 Mar 23	12 Mar 23

เอกสารอ้างอิง (Drawing & Reference)				
No.	**Document Name**	**Drawing No**	**Document File**	**Comment**
1	node1			
2	node2			

Node List (PID / PFD และ NODE Marked)							
No.	**Node**	**Design Intent**	**Design Conditions**	**Operating Conditions**	**Node Boundary**	**Drawing No**	**Drawing Page (From-To)**

RECCOMENDATION STATUS TRACKING TABLE					
REF.	**NODE**	**RR**	**Recommendation**	**Status**	**Action By** (Response & Signature)
1	node1	H	r1	Closed	Dungrat (TOP-XX)
2	node1		r2	Closed	Dungrat (TOP-XX)
3	node1			Closed	Dungrat (TOP-XX)
4	node1			Closed	Dungrat (TOP-XX)
5	node1			Closed	Dungrat (TOP-XX)
6	node1			Closed	Dungrat (TOP-XX)
7	node1			Closed	Dungrat (TOP-XX)
8	node2	M	r1	Open	TOP CMDP-Jaruwat P.
9	node2	L	r2	Open	TOP CMDP-Jaruwat P.
10	node2			Open	TOP CMDP-Jaruwat P.
11	node2			Open	TOP CMDP-Jaruwat P.
12	node2			Open	TOP CMDP-Jaruwat P.
13	node2			Open	TOP CMDP-Jaruwat P.
14	node2			Open	TOP CMDP-Jaruwat P.

Major Accident Event (MAE)			
No.	**Node**	**Causes**	**Risk Asseessment Matrix (R)**
1	node2		
2	node1	x1	H

Safety Critical Equipment (SCE)			
No	**Equipment Tag No.**	**ผลกระทบที่เกิดขึ้น (Consequences)**	**ระดับความเสี่ยง (Risk)**

HAZOP STUDY WORKSHEET

Project:	t2	**NODE**	**node2**
Design Intent :		**System**	
Design Conditions:		**HAZOP Boundary**	
Operating Conditions:			
PFD, PID No. :		**Date**	

Guide Word	Deviation	Causes	Consequences	Unmitigated Risk Assessment			Major Accident Event	Existing Safeguards	Mitigated Risk Assessment Matrix			Action No	Recommendations	Action by
				S	L	R	(Y/N)		S	L	R			
Flow	1.4 Reverse Flow	c1		4	3	H		5400	3	3	M		r1	TOP CMDP-Jaruwat P
Flow	1.5 MisdirectedFlow	c2		4	2	M		5400	3	2	L		r2	TOP CMDP-Jaruwat P
Flow	1.3 Less/Low Flow	c3												TOP CMDP-Jaruwat P
Flow	1.1 No Flow	c4												TOP CMDP-Jaruwat P
Flow	1.2 More/HighFlow	c5												TOP CMDP-Jaruwat P
Pressure	2.2 Less/Low Pressu	c6												TOP CMDP-Jaruwat P
Pressure	2.1 More/High Press	c7												TOP CMDP-Jaruwat P

Note:

HAZOP STUDY WORKSHEET

Project:	t2	**NODE**	**node1**
Design Intent :		**System**	
Design Conditions:		**HAZOP Boundary**	
Operating Conditions:			
PFD, PID No. :		**Date**	

Guide Word	Deviation	Causes	Consequences	Unmitigated Risk Assessment			Major Accident Event	Existing Safeguards	Mitigated Risk Assessment Matrix			Action No	Recommendations	Action by
				S	L	R	(Y/N)		S	L	R			
Flow	1.4 Reverse Flow	x1		4	4	H	Y	ex1	4	3	H		r1	Dungrat (TOP-XX)
Flow	1.5 MisdirectedFlow	x2	c1					41					r2	Dungrat (TOP-XX)
Flow	1.3 Less/Low Flow	x3	c2											Dungrat (TOP-XX)
Flow	1.1 No Flow	x4	c3											Dungrat (TOP-XX)
Flow	1.2 More/HighFlow	x5	c4											Dungrat (TOP-XX)
Pressure	2.2 Less/Low Pressu	x6												Dungrat (TOP-XX)
Pressure	2.1 More/High Press	x7												Dungrat (TOP-XX)

Note:

ภาคผนวก ก
ข้อมูลและตารางอ้างอิงสำหรับการประเมินความเสี่ยง

APPENDIX A
PHA -WORKSHEETS

ตารางการประเมินความเสี่ยง (Risk Assessment Matrix (RAM))

ระดับความรุนแรง	โอกาสในการเกิดความเสี่ยง 4	3	2	1
4	มากที่สุด 4	มากที่สุด 4	มาก 3	ปานกลาง 2
3	มากที่สุด 4	มาก 3	ปานกลาง 2	ปานกลาง 2
2	มาก 3	ปานกลาง 2	ปานกลาง 2	น้อย 1
1	ปานกลาง 2	ปานกลาง 2	น้อย 1	น้อย 1

Risk Assessment Matrix : 4X4

HAZOP Guide Words

Deviations	Guide Word	Process Deviation (Examples of Cause)	Area of Application
		Flow	
1.1 No Flow	Flow	Incorrect routing – blockage – burst pipe – large leak – equipment failure (C.V., isolation valve, pump, vessel, etc.) – incorrect pressure differentia	
1.2 More/HighFlow	Flow	Increased pumping capacity – reduced delivery head increased suction pressure – static generation under high velocity – pump gland leaks –etc.	
1.3 Less/Low Flow	Flow	Line blockage– filter blockage – fouling in vessels – defective pumps – restrictor or orifice plates –etc.	
1.4 Reverse Flow	Flow	Incorrect pressure differential – two-way flow – emergency venting – incorrect operation – in-line spare equipment –etc.	
1.5 MisdirectedFlow	Flow	Flow directed to stream other than intended due to misalignment of valves –etc.	
		Level	
4.1 Less/Low Level	Level		
4.1 More/High Level	Level		
		Other Then	
5.1 Composition Cha	Other Then		
5.10 External Fire/Ex	Other Then		
5.11 Safety&Human	Other Then		
5.12 Optional Guidev	Other Then		
5.2 Contamination	Other Then		
5.3 Leakage(Heat Ex	Other Then		
5.4 Reaction	Other Then		
5.5 Start Up/Shut Do	Other Then		
5.6 Vent/Drain/Purge	Other Then		
5.7 Maintenance/Ins	Other Then		
5.8 Corrosion/Erosio	Other Then		
5.9 Utilities Service F	Other Then		
		Pressure	
2.1 More/High Press	Pressure	Surge problems (line and flange sizes) – relief philosophy (process / fire etc.) – connection to high pressure system – gas breakthrough (inadequa	
2.2 Less/Low Pressu	Pressure	Generation of vacuum condition – restricted pump/ compressor suction line – vessel drainage –etc.	
		Temperature	
3.1 More/High Temp	Temperature	Ambient conditions – fire situation – high than normal temperature – fouled cooler tubes – cooling water temperature wrong –cooling water failure	
3.2 Less/Low Tempe	Temperature	Ambient conditions – reducing pressure – loss of heating – depressurization of liquefied gas – Joule Thompsoneffect – line freezing –etc.	
		Viscosity	
5.1 More Viscosity	Viscosity		
5.2 Less Viscosity	Viscosity		

ภาคผนวก - PIDs / PFDs

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	1		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x1		
Cause:			
Consequences:	ex1		
Safeguards:	r1		
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	1		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x2		
Cause:	c1		
Consequences:	41		
Safeguards:	r2		
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x3		
Cause:	c2		
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x4		
Cause:	c3		
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x5		
Cause:	c4		
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x6		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET			
Project Title:t2 **Project No:HAZOP-2023-0000014** **Node:**			
Action By:	Dungrat (TOP-XX)	**Response By:**	Dungrat (TOP-XX)
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	x7		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	By whom	Signature	Date
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	1		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c1		
Cause:			
Consequences:	5400		
Safeguards:	r1		
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	1		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c2		
Cause:			
Consequences:	5400		
Safeguards:	r2		
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c3		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET

Project Title:t2

Project No:HAZOP-2023-0000014

Node:

Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c4		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	**By whom**	**Signature**	**Date**
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET			
Project Title:t2 **Project No:HAZOP-2023-0000014** **Node:**			
Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c5		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	By whom	Signature	Date
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET			
Project Title:t2 **Project No:HAZOP-2023-0000014** **Node:**			
Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c6		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	By whom	Signature	Date
Response			
Ownner Approval			

HAZOP RECOMMENDATION RESPONSE SHEET			
Project Title:t2 **Project No:HAZOP-2023-0000014** **Node:**			
Action By:	TOP CMDP-Jaruwat P.	**Response By:**	TOP CMDP-Jaruwat P.
Action No.	0		
Drawing and Documents	d2 (Resume_Noppawit Yurayatra.pdf)		
Action Description			
Deviation:	c7		
Cause:			
Consequences:			
Safeguards:			
Recommendation:			
Action Response:			

Action Close-out Details	By whom	Signature	Date
Response			
Ownner Approval			

SUWANNARAT BUAYANG

SOFTWARE ENGINEER

CONTACT

097-261-5466

SuwannaratBy@gmail.com

12/22 village No.11 ,Khlong ha, Khlong luang, Pathum Thani 12120

TECHNICAL SKILLS

Language : JavaScript , Python, CSS , HTML

Tool/Framework : Visual Studio , Mongo DB , ReactJS, Node.js,

Software : MS excel , Power BI,

PERSONAL SKILL

- Ability work under pressure
- Self-motivation and eager to learn new skill
- Can work independently and eager can also collaborate with groups or teams

EDUCATION

Rajamangala university of technology thanyaburi

Bachelor of chemical engineering

2018 - 2022

GPA 3.46/4.00

LANGUAGES

Thai	Native
English	Internediate
Chinese	Basic

PROFILE

Being a beginner in the sector of information technology and software industry , I am a fresher who interested in the role of a software Engineer. I wishes to equip myself with additional skill and obtain a challenging position that fully utilizes my skills and provides me with suitable opportunities to grow my technical and analytical skill.

WORK EXPERIENCE

Process Engineer

MegnecompPrecision Technology — June 2022 - May 2023

- Check daily production result (yield, defect details) collecting data and writing reports.
- Analysis, investigation, discuss and solve complex problems by interacting with manufacturing departments and support production in daily activities.
- Provide training for operators and technicians on process and equipment related knowledge.
- Establish and maintain process documentation including WI , control plan, process flow , SOP

Research Assistant

Thailand Instituted of Scientific and Technological Research — Nov 2021 - June 2022

- Support on research projects and lab work including experimental design and performanc.
- Manage testing design, Setup equipment, execution timing and data roll up of projects and responsible for overseeing the recording, computing and analyzing of test data.
- Coordinate instrument qualification, maintenance and repair activities for equipment.
- Develop appropriate experimental plans and measurement methods of analysis for technical problems/research
- write-up final reports, including calculation and analysis of test.

CERTIFICATIONS

- udermy certified: The complete 2023 Web Development Bootcamp