Group Assignment Cover Sheet

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- Please print clearly and complete all sections. All group members must sign the declaration below.
- Before submitting this assignment, students are strongly recommended to review the course outline, assessment requirements, UNSW's Plagarism and Academic Integrity website and Administrative Matters on the School's website.
- Please retain a copy of this assignment for your records.

Course code: GSOE 9820 **Course name: Project Management, Term 2 2021**

Date submitted: 2022-03-29

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We have retained a copy of this, our assignment, which we can provide if necessary. By signing this declaration we are agreeing to the statements and conditions above.

Team Attribution Survey and Signature Table

FAMILY NAME	GIVEN NAME(S)	STUDENT ID	CONTRIBUTION % (*C*)	SIGNATURE
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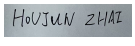
Zhai	Houjun	5129008	30	

Grading procedure:

1. The report is marked according to the marking guide giving raw grade ***R***.
2. The team's demonstrator will check, modify if necessary, and approve the team attribution survey.
3. The approved contribution of a group member is ***C***.
4. Each group member receives a final grade ***F = R x C x N*** *(where **N** is number of group members).*
5. You will be individually notified of ***F*** and ***R***.

Table of Contents

1. Project Charter

1.1 Project Background

ENI, a multinational energy company, has discovered a significant amount of gas on the Jangkrik Offshore Development project. To sell gas to Pertamina and ultimately satisfy Indonesian consumption, the project has successfully built four wells at Jangkrik fields, awaiting the subsea structure to be installed to collect gas production.

The Jangkrik Offshore Development aims to increase gas production, satisfy Indonesia's domestic consumption, and ultimately maintain energy security and independence and reduce emissions via collecting gas production from underwater to above sea via ta transportation system using subsea manifolds and flexible pipelines.

The requirements of the project are driven by organizational strategies and are presented in below table:

Organizational strategic objective	High-level project requirement
Increase gas use to 19% of the total national energy mix in 2030 (Pertamina, 2021)	Meet the increasing need for gas consumption in Indonesia
Increase the shared gas on total production as part of the efforts to achieve net-zero emission by 2050 (ENI, 2021)	Increase gas production as part of ENI's production

1.2 Project Scope and Exclusion

This project is to complete the final phase of the Jangkrik Offshore Development Project, which includes installing the subsea manifold structure and four flexible pipelines, for under 75 million dollars within 4 years. The structure needed to be designed, produced, assembled installed, and tested. This project will finally deliver high production of gas for Indonesia to meet the domestic consumption needs. The whole project needs to be done whilst minimizing environmental impact.

To measure the successful delivery of the project scope, we need to evaluate the output against the below criteria:

- The project constraints are not broken – the project delivered within budget and time
- Testing of the gas production system has been completed and demonstrates compliance with requirements of transporting gas from wells under the ocean to the Floating Production Storage Offloading
- Gas production system has been handed over to ENI and reviewed by ENI representatives

The scope does not include:

- Deployment of Floating Production Storage Offloading
- Gas production well-related works

1.3 Project Benefits

Upon successfully delivery of the project, the below benefits will be realized:

- ENI will generate financial income by selling the gas production to Pertamina
- Pertamina will be able to better satisfy the energy consumption need of the Indonesian population and benefit financially from it
- Local community and Bakau Port will be able to attract related industrial investment

The environment will be better protected with gas replacing pollutive energy sources.

1.4 Constraints and Assumptions

The constraints of the project have been given by the client that the project will need to be completed within 4 years under the budget of 75 million dollars.

The project also depends on several key assumptions. One of the main assumptions is that the project can utilize resources and knowledge from ENI to complete the supporting tasks such as hiring, payroll, and legal activities. This will save a lot of time from having to recruit those resources to initiate the project.

Another key assumption is that required resources will be readily available and obtained from ENI or the market. Using ENI's resources would help accelerate the project and meets the ambitious schedule requirements; however, if not available, the market can be the second choice with a speedy response. If the assumption becomes incorrect, the project duration might need to be extended.

It is also assumed that the pre-exploratory of the oil wells and the recommended approval documents from the designated authorities are obtained to proceed further.

A main key aspect of the construction project is safety, it is assumed that the staff involved in the development project follow existing safety guidelines by the sponsor organization and other third-party contractors.

2. Work Breakdown Structure

The Jangkrik Offshore Development Project is divided into 9 major phases and further broken down into necessary work packages. The major phases are divided based on short-term milestones achievable in each phase.

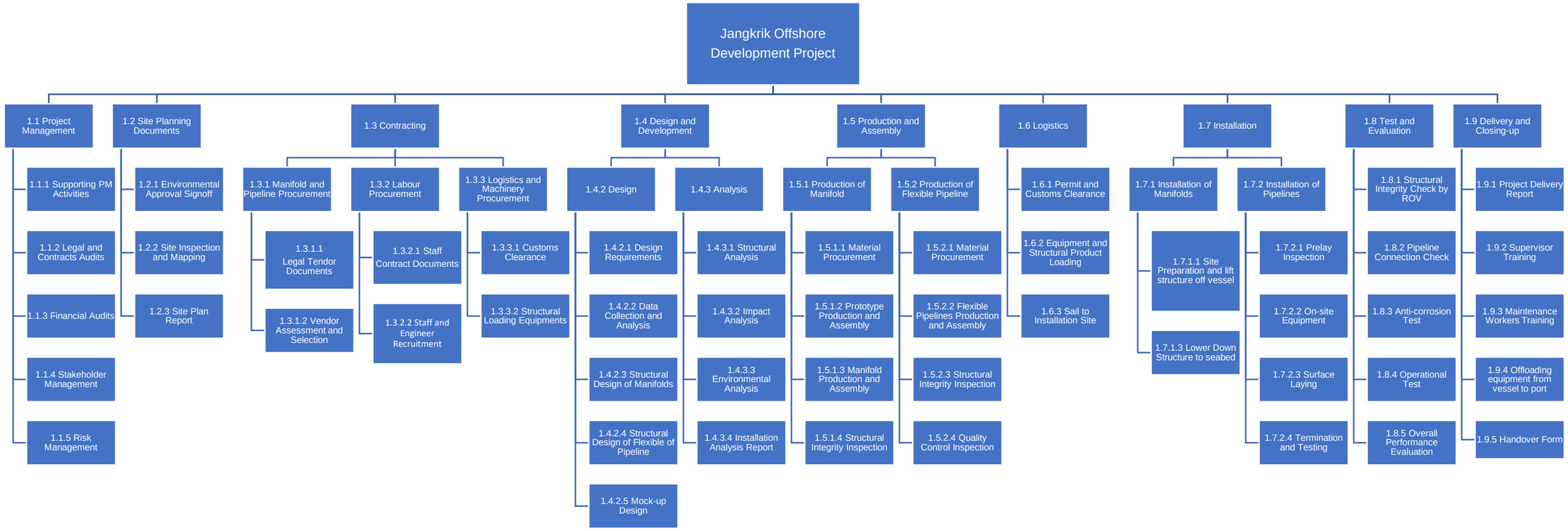


Figure 2.1 Work Breakdown Structure of Jangkrik Offshore Development Project

3. Estimates of Time and Cost

The estimates of time and cost play a significant role in the whole project management work. The bottom-up estimating method is applied to accurately estimate the aggregated cost and the duration of the project. To make it clear, we divide the total cost into labor cost and material cost. And from that we got our total estimated direct cost to be AUD53,412,749. The detailed cost of each section is listed below in Tables 1 and 2. The estimated salaries for laborers are quoted from Glassdoor (2022).

Labour Job Title	Amount	Base Pay	Oncost 21.51% (Super incl.)	Working Duration(year)	Total Cost (AUD)
FULL-TIME WORKERS					
Project Manager	1	150,000	182,265	4	729,060
Project Administrator	1	70,000	85,050	4	340,200
Contract Administrator	1	100,000	121,510	4	486,040
Installation Lead Engineer	1	150,000	182,265	4	729,060
Structural and Design Lead Engineer	1	180,000	218,718	4	874,872
CONTRACTOR					
Offshore Construction Manager	1	130,000	157,963	1	157,963
Offshore Seaman Team	6	98,800	120,052	1	720,312
Safety & Quality Team	2	88,900	108,022	1	216,044
Testing Team	2	94,800	115,191	1month	19,198
Total					**4,272,749**

Table 3.1 Labour cost

Materials and Equipment	Amount	Cost (per item/unit)	Lump-Sum Payment	Total Cost (AUD)
Subsea Manifold	4	6,500,000	-	26,000,000
Installation Vessel	153	80,000	-	12,240,000
Flexible Pipeline	6	1,700,000	-	10,200,000
Port Mobilization Fee	1	-	150,000	150,000
Port Demobilization Fee	1	-	100,000	100,000
Port Permit Fee	1	-		450,000
Total				**49,140,000**

Table 3.2. Material and Equipment Cost

Overhead costs are the indirect costs (rent, insurance, custom, utilities, software, etc.) associated with the day-to-day operations of a project. Thus, this is to be taken into our consideration as well. We assume that our overhead rate to be 15% and then we can get our overhead cost to be AUD7,497,299.

$$overhead\ cost = overhead\ rate * direct\ cost$$

Also, the contingency budget cannot be neglected, an additional 5%-10% of each section of the total cost is included to cover potential events that are not specifically accounted for.

	Total Amount	Contingency Budget Percentage	Total Cost (AUD)
Labour Cost	4,272,749	10%	4,700,023
Material and Equipment	49,140,000	5%	51,597,000
Overhead Cost	8,011,912	10%	8,813,104
Management Reserve			9,889,873
Total Budget			**75,000,000**

Table 3.3. Contingency Budget

Consequently, we have allocated our total budget of **AUD 75,000,000.**

After using bottom-up to estimate the duration of different work packages, we have the duration of the whole project to be 3 years and 11 months (1022 working days included). The estimated duration of each part of the project is shown below (workdays counted only)

Major Deliverable	Estimated Duration (days)
Project Management	17
Site planning documents	12
Contracting	42
Design and Development	864
Production and Assembly	395
Logistics	68
Installation	92
Test and Evaluation	23
Delivery and Closing-up	34

Table 3.4. Estimation Duration

4. Project Schedule

The project schedule is reproduced in the following formats:

- **Gantt Chart** - to show the broader time scope of the project specified in Section 6.5.3.2 (Project Schedule) of PMBOK® 6th ed (Project Management Institute, 2017).
- **Network Diagram** - to show dependencies between work packages and highlight critical tasks. specified in Section 6.3.2 (Sequence Activities: Tools and Activities) of PMBOK® 6th ed (Project Management Institute, 2017).

Task ID	Major Deliverables	Duration	Start Date	Complete Date	Completion
1.1	Project Management	17 Days	28/03/2022	19/04/2022	100%
1.2	Site Planning Documents	12 Days	20/04/ 2022	05/05/2022	100%
1.3	Contracting	42 Days	20/04/2022	16/06/2022	100%
1.4.1	Manifold and Flexible Pipeline Design	335 Days	17/06/2022	28/09/2022	100%
1.4.2	Analysis	529 Days	29/09/2023	08/10/2025	100%
1.5.1	Production of Manifolds	395 Days	23/10/2023	25/04/2025	100%
1.5.2	Production of Flexible Pipeline	247 Days	23/10/2023	01/10/2024	100%
1.6	Logistics	68 Days	28/04/2025	30/07/2025	100%
1.7.1	Installation of Manifolds	42 Days	31/07/2025	26/09/2025	100%
1.7.2	Installation of Flexible Pipeline	50 Days	29/09/2025	05/12/2025	100%
1.8	Testing and Evaluation	23 Days	08/12/2025	07/01/2026	100%
1.9	Delivery and Cleaning Up	34 Days	08/01/2026	24/02/2026	100%

Table 4.1. Summary Project Schedule

4.1 Project Schedule Gantt Chart

	Task Name	Duration	Start	Finish
1	**1. Jangkrik Offshore Development Project**	**1022 days**	**Mon 28-03-22**	**Tue 24-02-26**
2	**1.1 Project Management**	**17 days**	**Mon 28-03-22**	**Tue 19-04-22**
3	1.1.1 Supporting PM Activities	7 days	Mon 28-03-22	Tue 05-04-22
4	1.1.2 Legal and Contracts Audits	10 days	Wed 06-04-22	Tue 19-04-22
5	1.1.3 Financial Audits	10 days	Wed 06-04-22	Tue 19-04-22
6	1.1.4 Stakeholder Management	10 days	Wed 06-04-22	Tue 19-04-22
7	1.1.5 Risk Management	10 days	Wed 06-04-22	Tue 19-04-22
8	**1.2 Site Planning Documents**	**12 days**	**Wed 20-04-22**	**Thu 05-05-22**
9	1.2.1 Environmental Approval Sign-off	4 days	Wed 20-04-22	Mon 25-04-22
10	1.2.2 Site Inspection and Mapping	5 days	Tue 26-04-22	Mon 02-05-22
11	1.2.3 Site Plan Report	3 days	Tue 03-05-22	Thu 05-05-22
12	**1.3 Contracting**	**42 days**	**Wed 20-04-22**	**Thu 16-06-22**
13	**1.3.1 Manifold and Pipeline Procurement**	**28 days**	**Wed 20-04-22**	**Fri 27-05-22**
14	1.3.1.1 Legal Tendor Documents	8 days	Wed 20-04-22	Fri 29-04-22
15	1.3.1.2 Vendor Assessment and Selection	20 days	Mon 02-05-22	Fri 27-05-22
16	**1.3.2 Labor Procurement**	**42 days**	**Wed 20-04-22**	**Thu 16-06-22**
17	1.3.2.1 Staff Contract Documents	14 days	Wed 20-04-22	Mon 09-05-22
18	1.3.2.2 Staff and Engineer Recruitment	28 days	Tue 10-05-22	Thu 16-06-22
19	**1.3.3 Logistics and Machinery Procurement**	**33 days**	**Wed 20-04-22**	**Fri 03-06-22**
20	1.3.3.1 Logistics and Machinery Tendor Documents	16 days	Wed 20-04-22	Wed 11-05-22
21	1.3.3.2 Structural Loading Equipments	17 days	Thu 12-05-22	Fri 03-06-22
22	**1.4 Design and Development**	**864 days**	**Fri 17-06-22**	**Wed 08-10-25**
23	**1.4.1 Design**	**335 days**	**Fri 17-06-22**	**Thu 28-09-23**
24	1.4.2.1 Design Requirements	46 days	Fri 17-06-22	Fri 19-08-22
25	1.4.2.2 Data Collection and Analysis	42 days	Mon 22-08-22	Tue 18-10-22
26	1.4.2.3 Structural Design of Manifolds	215 days	Wed 19-10-22	Tue 15-08-23
27	1.4.2.4 Structural Design of Flexible of Pipeline	185 days	Wed 19-10-22	Tue 04-07-23
28	1.4.2.5 Mock-up Design	32 days	Wed 16-08-23	Thu 28-09-23
29	**1.4.2 Analysis**	**529 days**	**Fri 29-09-23**	**Wed 08-10-25**
30	1.4.3.1 Structural Analysis	16 days	Fri 29-09-23	Fri 20-10-23
31	1.4.3.2 Impact Analysis	14 days	Fri 29-09-23	Wed 18-10-23
32	1.4.3.3 Environmental Analysis	7 days	Fri 29-09-23	Mon 09-10-23
33	1.4.3.4 Installation Analysis Report	8 days	Mon 29-09-25	Wed 08-10-25
34	**1.5 Production and Assembly**	**395 days**	**Mon 23-10-23**	**Fri 25-04-25**
35	**1.5.1 Production of Manifold**	**395 days**	**Mon 23-10-23**	**Fri 25-04-25**
36	1.5.1.1 Material Procurement	84 days	Mon 23-10-23	Thu 15-02-24
37	1.5.1.2 Prototype Production and Asse	46 days	Fri 16-02-24	Fri 19-04-24
38	1.5.1.3 Manifold Production and Assen	247 days	Mon 22-04-24	Tue 01-04-25
39	1.5.1.4 Structural Integrity Inspection	18 days	Wed 02-04-25	Fri 25-04-25
40	**1.5.2 Production of Flexible Pipeline**	**247 days**	**Mon 23-10-23**	**Tue 01-10-24**
41	1.5.2.1 Material Procurement	23 days	Mon 23-10-23	Wed 22-11-23
42	1.5.2.2 Flexible Pipelines Production ar	185 days	Thu 23-11-23	Wed 07-08-24
43	1.5.2.3 Structural Integrity Inspection	21 days	Thu 08-08-24	Thu 05-09-24
44	1.5.2.4 Quality Control Inspection	18 days	Fri 06-09-24	Tue 01-10-24
45	**1.6 Logistics**	**68 days**	**Mon 28-04-25**	**Wed 30-07-25**
46	1.6.1 Permit and Customs Clearance	8 days	Mon 28-04-25	Wed 07-05-25
47	1.6.2 Equipment and Structural Product L	11 days	Thu 08-05-25	Thu 22-05-25
48	1.6.3 Sail to Installation Site	49 days	Fri 23-05-25	Wed 30-07-25
49	**1.7 Installation**	**92 days**	**Thu 31-07-25**	**Fri 05-12-25**
50	**1.7.1 Installation of Manifolds**	**42 days**	**Thu 31-07-25**	**Fri 26-09-25**
51	1.7.1.1 Site Preparation and lift structu	18 days	Thu 31-07-25	Mon 25-08-25
52	1.7.1.2 Lower Down Structure to seab	24 days	Tue 26-08-25	Fri 26-09-25
53	**1.7.2 Installation of Pipelines**	**50 days**	**Mon 29-09-25**	**Fri 05-12-25**
54	1.7.2.1 Pre-lay Inspection	8 days	Mon 29-09-25	Wed 08-10-25
55	1.7.2.2 On-site Equipment Preperation	7 days	Thu 09-10-25	Fri 17-10-25
56	1.7.2.3 Surface Laying	31 days	Mon 20-10-25	Mon 01-12-25
57	1.7.2.4 Termination and Testing	4 days	Tue 02-12-25	Fri 05-12-25
58	1.8 Test and Evaluation	23 days	Mon 08-12-25	Wed 07-01-26
59	1.8.1 Structural Integrity Check by ROV	6 days	Mon 08-12-25	Mon 15-12-25
60	1.8.2 Pipeline Connection Check	5 days	Mon 08-12-25	Fri 12-12-25
61	1.8.3 Anti-corrosion Test	4 days	Tue 16-12-25	Fri 19-12-25
62	1.8.4 Operational Test	6 days	Mon 22-12-25	Mon 29-12-25
63	1.8.5 Overall Performance Evaluation	7 days	Tue 30-12-25	Wed 07-01-26
64	**1.9 Delivery and Closing-up**	**34 days**	**Thu 08-01-26**	**Tue 24-02-26**
65	1.9.1 Project Delivery Report	2 days	Thu 08-01-26	Fri 09-01-26
66	1.9.2 Supervisor Training	31 days	Thu 08-01-26	Thu 19-02-26
67	1.9.3 Maintenance Workers Training	20 days	Thu 08-01-26	Wed 04-02-26
68	1.9.4 Offloading equipment from vessel t	8 days	Thu 08-01-26	Mon 19-01-26
69	1.9.5 Handover Form	3 days	Fri 20-02-26	Tue 24-02-26

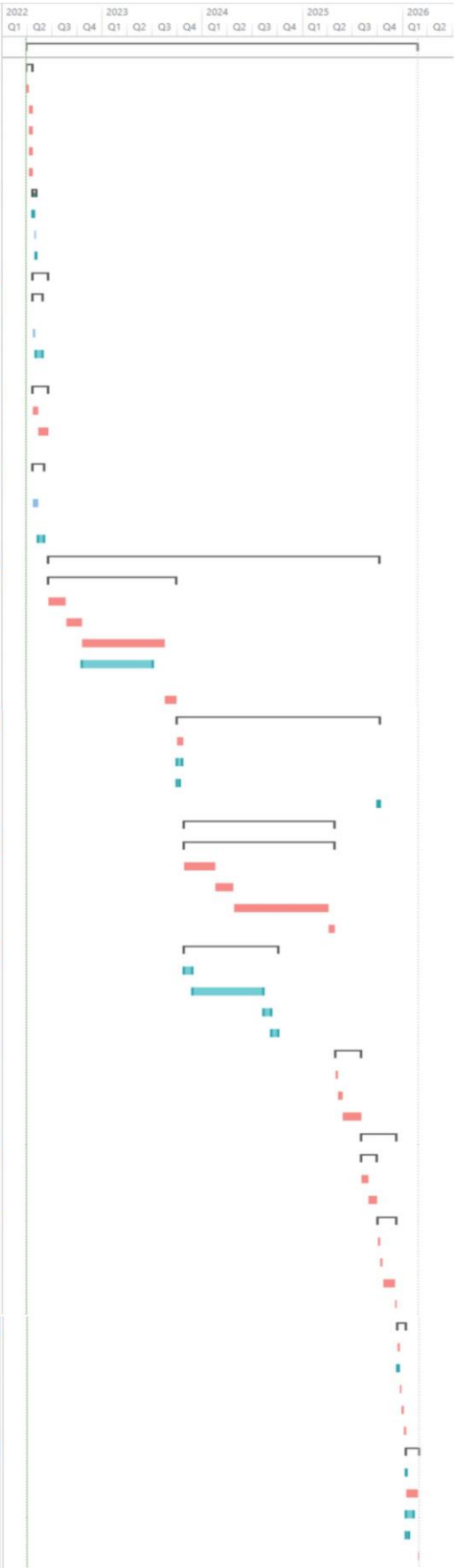


Figure 4.1. Gantt Chart

5. Network Diagram

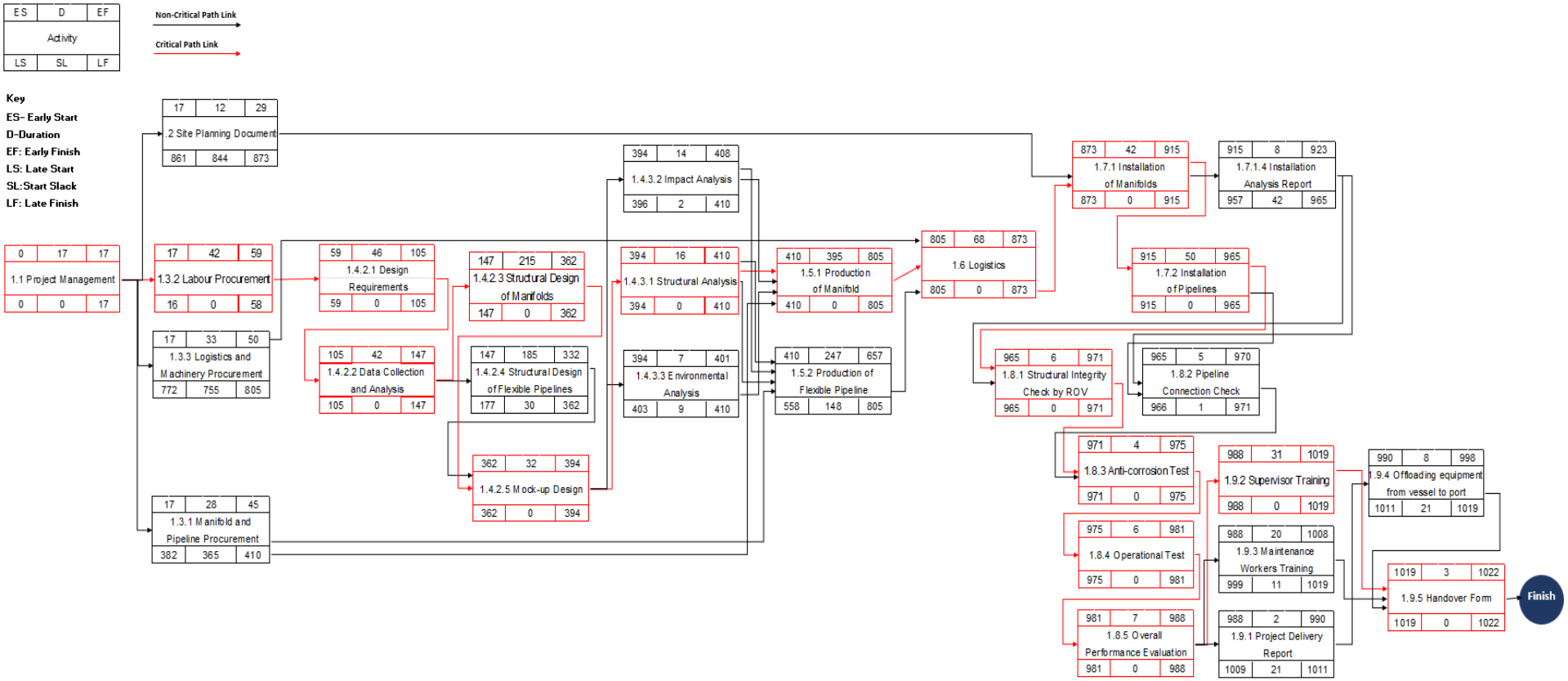


Figure 5.1 Network Diagram

6. Stakeholder Management

6.1 Overview

The identification, analysis, and management of stakeholders is a very significant component of project management. This is because their needs, concerns, power, and interests directly or indirectly affect the objectives, progress, risks, and deliverable of the project.

6.2 Identified Stakeholder List

For the Jangkrik Offshore Development Project, the team iteratively used the tools and technologies specified in Section 13.1.2.1 (Expert Judgement) and 13.1.2.2 (Data Gathering) of PMBOK® 6th ed (Project Management Institute, 2017) to generate a stakeholder register, which contains the identity, background, contact details and works the content of each stakeholder in the project. The following is a simple list, details of the register list are in Appendix 1: Table 1.

Role	Persons
Sponsor	• Hasliza Omar
Delivery Partners	• Installation contractors & Fabricators - Director Lee (Technip FMC director) • Pipeline vendors - Manager Liu (Manager of pipeline Supply Company) • Installation crew – CT Construction Team
Statutory Authority	• Indonesia State Ministry of Environment and Forestry • Bakau Port Authority
Others for considerations	• Environmental organizations • Indonesian Ministry of Manpower and Transmigration • Local communities
Project Management Team	• Construction-Group 5

Table 6.1. List of Stakeholders involved in the Project

6.3 Stakeholder Analysis and Engagement

Some of the data analysis tools in Section 13.1.2.3 of PMBOK® 6th ed (Project Management Institute, 2017) were applied to further classify and analyze the stakeholders identified in the previous section. Stakeholders are those who are interested and influential in the project. Each stakeholder is assessed according to the level of power and interest. The powers and interests are divided into 1-5 different levels. The details of different ratings are shown in Appendix 2: Table 3 and Table 4. Comprehensively consider these two indicators to determine the participation level of stakeholders and form a Decision Matrix shown in Appendix 2: Table 5. And improve and transform the participation level of stakeholders into four organizational capabilities (Appendix 2: Table 6). Finally, an effective stakeholder management table is generated. The table is shown in Appendix 2: Table 2. Through this multi-criteria analysis, every stakeholder can be involved to maximize their contribution to the project, and their needs will be met to the greatest extent.

7. Communications Plan

7.1 Overview

A communication plan is a very important part of this project because it can enable project stakeholders to exchange project information in time, such as objectives, processes, risks, changes in client needs, and so on. Timely communication can better promote the project. The communication plan usually includes the person in charge of the meeting, the audience attending the meeting, the communication frequency, communication tools, communication content, and deliverable.

7.2 Communications Tools

There are many ways of communication, such as telephone, email, face-to-face communication, or some online software such as zoom and teams. Different tools should be used in different situations. Choosing appropriate communication tools according to specific situations should be considered. For example, in an emergency, using email as an inefficient way of communication may pose some risks.

The following table shows the details of the communication plan between stakeholders.

Person in charge	Audience	Frequency	Tools	Content	Deliverable
Project Management Team	Installation contractors	Once	Face-to-Face	• Building Teams • Arrange project details	• Meeting minutes • Project proposal
Project Management Team	Installation contractors	Monthly	Chat/ Email	• Confirm project process	• Meeting minutes • Project process
Installation contractors	Installation crew	Weekly	Chat/ Email	• Weekly Installation plan	• Meeting minutes • Installation plan
Project Management Team	Fabricators Pipeline vendors	Once	Face-to-Face	• Confirm materials used	• Meeting minutes • Materials details
Project Management Team	Indonesian Ministry of Manpower and Transmigration	Once	Face-to-Face	• Recruitment of project members	• Meeting minutes • List of Project members
Project Management Team	Pertamina	Monthly	Chat/ Email	• Report project progress	• Meeting minutes
Project Management Team	Sponsor	Monthly	Chat/ Email	• Report project progress • Confirm sponsorship details	• Meeting minutes
Project Management Team	Pertamina	Anytime (urgent)	Online meeting /Face-to-Face	• Any change in the project	• Meeting minutes
Installation contractors	Project Manager Installation crew	Anytime (urgent)	Online meeting /Face-to-Face	• Any problem made in the project	• Meeting minutes

Table 7.1 Engagement lever of stakeholders

8. Human Resource Plan

The human resource plan outlines how and what to form the project team as well as the management such as organization structure and requirements and responsibilities of the roles.

8.1 Acquisition of Human Resources

8.1.1 Hiring Strategies

The necessary project team will be recruited by the human resource department of ENI with the position description given by the project manager and interviewed by a panel of project managers, project sponsors, and technical experts from ENI. The core project stream leads should ideally be sourced internally from ENI such that expertise in the construction and energy industry, project, and the specific site can be fully leveraged. Additional junior resources supporting the stream leads will be selected through a tender process, with bidding specifications from each stream of the project team.

8.1.2 Position Descriptions

Position: Full-time **Project Manager** 4 years (Hired – Group 5)
Description: The project manager will work closely with the project sponsor to lead the planning, execution, monitoring, controlling, and delivering the project, which deploys the gas production system from undersea wells to floating pipeline and storage offloading units with the design, installation, and handover of subsea manifolds and flexible pipelines.
Requirements: The successful applicant will have relevant qualifications and a minimum 10-year of experience in project managing similar projects in construction. They are capable of leading a team of 20 people in a predictive working environment with strong organizational, communication, and issue resolution skills. The ability to manage pa projects over a long-time span with multiple streams of work is necessary.

Position: Full-time **Project Administrator** 4 years
Description: The project Administrator will be responsible for the management of project communications and stakeholders, budget allocation and control, schedule alignment as well as procurement of any resources required to complete the build of the gas production system.
Requirements: The successful applicant will have at least 10 years of experience in project administration and understanding of the construction project process or 5 years of experience but with exposure to the existing well site construction. Other skills required are an exceptional problem-solving, strong attention to detail, outstanding written and verbal communication.

Position: Part-time **Contract Administrator** 4 years
Description: The contract Administrator will be responsible for all contract-related works including but not limited to tender specification, bidding processes, vendor management, and legal requirements to complete the build of the gas production system.
Requirements: The successful applicant will have at least 5 years of experience in contract administration and understanding of standards or regulations as well as experience in

procurement in Indonesia. Other skills needed are teamwork, strong attention to detail, outstanding written and verbal communication.

Position: Full-time **Installation Lead** 4 years
Description: The installation Lead will be responsible for all installation-related works for the undersea gas production system, making sure the gas production system is well built and tested. The position will also assist with the procurement of labour and equipment, design of the manifolds and pipelines, and handover training of the gas production system.
Requirements: The successful applicant will have relevant qualifications and a minimum 10-year of experience in construction engineering in several similar projects specializing installation related activities, preferably experience in previous phases of Jangkrik Development. They are passionate about environmental-friendly construction with a positive impact on human being and has the problem solving, teamwork, and communication skill for it. They can lead a team of junior engineers from sub-contractor and work together with the structural and design lead and on-site construction manager to carry out the work packages needed.

Position: Full-time **Structural and Design Lead** 4 years
Description: Structural and Design Lead will be responsible for all structural and design work for the undersea gas production system. The position will also aid with the procurement of necessary resources for building manifold and pipeline, as well as installation and testing of the completed system.
Requirements: The successful applicant will have relevant qualifications and a minimum 10-year of experience in construction engineering in several similar projects specializing in structural and design works, preferably experience in previous phases of Jangkrik Development. They are passionate about environmental-friendly construction with a positive impact on human beings. They can lead a team of junior engineers from the sub-contractor and work together with the installation lead and on-site construction manager to carry out the work packages required.

Position: Full-time **Offshore Construction Manager** 1 year
Description: Offshore Construction Manager will be responsible for managing the offshore team under the guidance of the Installation Lead to complete all installation-related work for the undersea gas production system.
Requirements: The successful applicant will have relevant qualifications and a minimum 5-year of experience in construction engineering onsite management, preferably experience in previous phases of Jangkrik Development. They can work together with the Installation Lead and Structural and Design Lead to carry out the work packages required. They also need persuasive communication and interpersonal skills to manage teams from sub-contractor on-site, as well as transfer handover knowledge to clients.

8.1.3 Hiring Sub-Contractors

The project will require additional labour or knowledge to support the core project team to carry out the work packages. For these tasks, sub-contractors will be brought in using the allocated budget. The sub-contractors will be selected through a tender process as per instructed by individual project stream leaders and approved by the project manager and contractor administrator.

8.2 Management of Human Resources

8.2.1 Project Organisation Chart

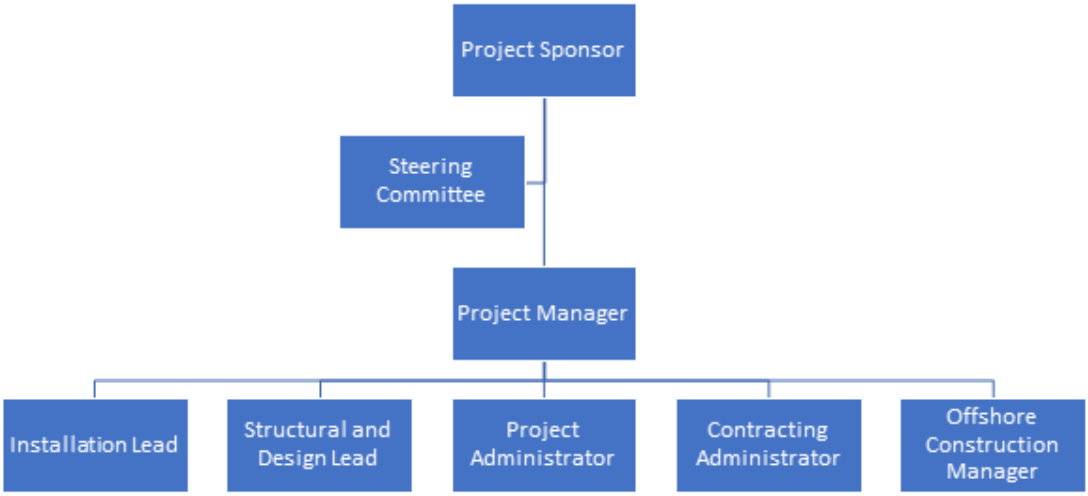


Figure 8.1. Project Organisation Chart

8.2.2 RACI Chart

1 Jangkrik Offshore Development Project	Project Manager	Installation Lead	Structural and Design Lead	Project Administrator	Contract Administrator	Offshore Construction Manager
1.1 Project Management						
1.1.1 Supporting PM Activities	A			R		
1.1.2 Legal and Contracts Audit	A			R	C	
1.1.3 Financial Audits	A			R		
1.1.4 Stakeholder Management	A			R		
1.1.5 Management of Risk	A	I	I	R		I
1.2 Site Planning Documents and Analysis						
1.2.1 Environmental Approval Signoff	A	I	I	R		
1.2.2 Site Inspection and Mapping	A	I		R		I
1.2.3 Site Plan Report	A	I		R		I
1.3 Contracting						
1.3.1 Manifold and Pipeline Procurement	A		C	R	I	
1.3.2 Labour Procurement	A	C	C	R	I	C
1.3.3 Logistics and Machinery Procurement	A	C		R	I	
1.4 Design & Development						
1.4.1 Design	A		R			
1.4.2 Analysis	A	C	R			I
1.5 Production and Assembly						
1.5.1 Production of Manifolds	A	R	R	I		
1.5.2 Production of Flexible Pipeline	A	R	R	I		
1.6 Logistics						
1.6.1 Permit and Customs Clearance	A			R		
1.6.2 Equipment and Structural Product Loading	A	C		R		I
1.6.3 Sail to Installation Site	A	C		R		I
1.7 Installation						
1.7.1 Installation of Manifolds	A	R	C			I
1.7.2 Installation of Pipelines	A	R	C			I
1.8 Test and Evaluation						
1.8.1 Structural Integrity Check by ROV	A	R	C			I
1.8.2 Pipeline Connection Test	A	R	C			I
1.8.3 Anti-corrosion Test	A	R	C			I
1.8.4 Operational Test	A	R	C			I
1.8.5 Overall Performance Evaluation	A	R	C			I
1.9 Delivery and Closing-up						
1.9.1 Project Delivery Report	A	C	C	R		
1.9.2 Supervisor Training	A	C		R		
1.9.3 Maintenance Workers Training	A	C		R		
1.9.4 Offloading Equipment from Vessel to Port	A			R		I
1.9.5 Handover Form	A			R		

Figure 8.2. RACI chart

8.2.3 Training Strategies

The induction and training process will first be conducted by the ENI HR department, while the specific knowledge required for the project will be obtained through training sessions carried out by the project administrator. Such training could include offshore safety, large equipment, subsea environment, and other specific areas within the project. This will be designed by the project administrator with the approval of the project manager.

9. Risk Management Plan

In the process of project implementation, few projects can be completed within the planned duration and budget. Therefore, it is essential to establish a risk management plan, which is conducted by identifying, evaluating, responding, and monitoring risk. The risk management plan will state how to manage risk for subsea pipeline installation projects. Therefore, this part aims to describe how PMs manage risk, which is mainly conducted by using the risk register to store individual project risks classified by their category, likelihood, potential impact, mitigation, and emergency plan. This risk management plan is divided into risk identification, project risk, risk assessment, risk response development, and risk response control.

9.1 Risk Identification

Project risks are identified and classified by a risk breakdown structure approach. According to the evaluation of the project risk, a contingency plan and risk register can be established which is based on the severity matrix

9.2 Project risk

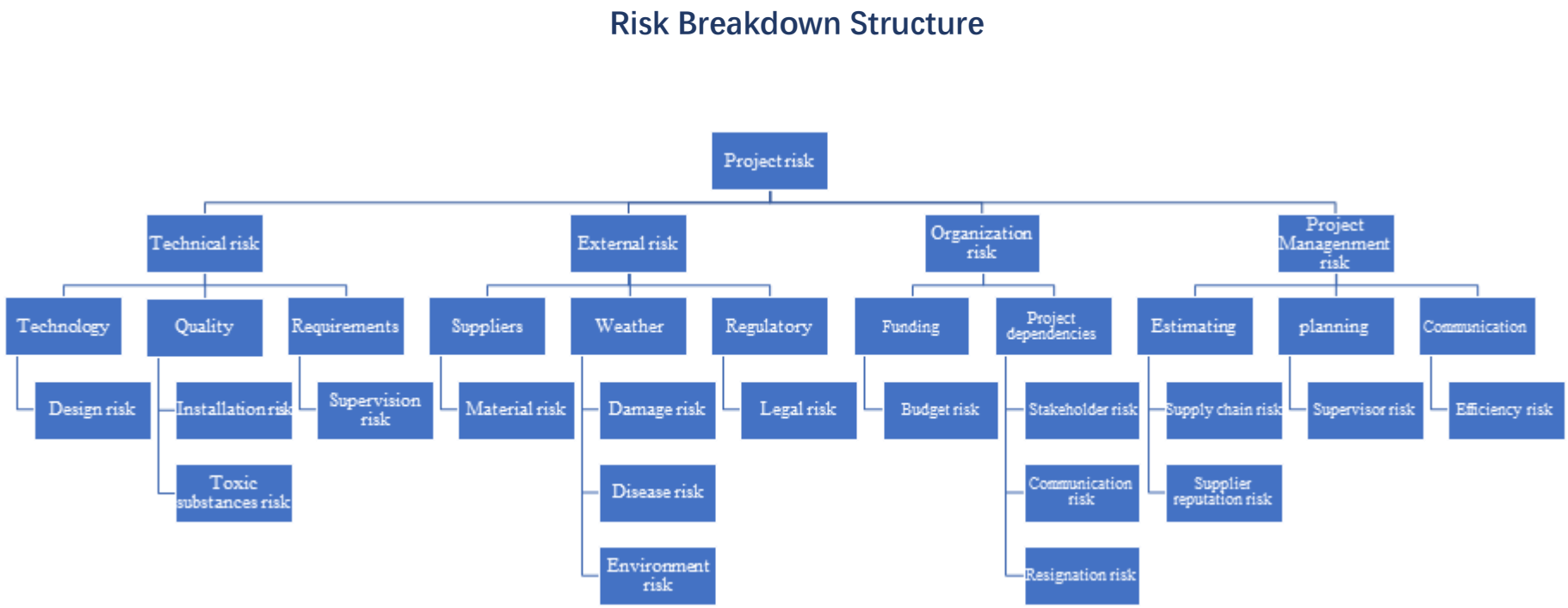


Figure 9.1. Risk Breakdown Structure

Technical Risk:

- The quality of gas pipelines construction does not meet project specifications or expectations
- There is no professional technician to supervise the quality of the pipeline
- Using some advanced and immature technologies which are not necessary for the project
- Unnecessary toxic substances are produced during construction
- Pipelines are not correctly maintained

External Risk:

- Damage to fabrication equipment and Pipeline
- Staff may suffer from flu, diarrhea, heat stroke, and other diseases during construction
- Supplier delays delivery of raw materials
- Staff resigns or cannot participate in the project due to force majeure
- The project was rejected by the Indonesian energy department or violated the legal requirements of the local environmental department
- Local organizations that threaten the personal safety of staff

Organizational Risk:

- The project's budget does not cover the cost of the project
- The investment from shareholders is reduced
- Lack of communication among team members leads to slow project progress

Project Management Risk:

- Installation equipment procured from suppliers cannot meet installation regulation
- The disruption of the supply chain led to difficulties sourcing materials or equipment
- The safety of undersea pipelines is not supervised

9.3 Contingency Planning

A contingency plan should be established if some unavoidable risk will happen. There are three contingency plans shown below.

Contingency Plan 1: Technical Risk Solution

If team members cannot install gas pipelines that meet the quality requirements, the project teams should communicate with relevant ENI departments and add more staff with professional installation skills. The potential effect of a contingency plan may increase the budget.

Contingency Plan 2: Contingency Funding

It is essential to communicate with ENI in advance and suggest they prepare emergency backup funds that may be required. Therefore, the project team can send an urgent request to ENI for backup funds if the budget of the project could not cover the project cost and maintain the operation of the project.

Contingency Plan 3: Reschedule

Reschedule the risk-free item of the project and use the time saved to complete the installation if the pipeline cannot be installed on time.

9.4 Risk Assessment:

Risk Severity Matrix

Risk Evaluation			Severity				
			Very low	Low	Medium	High	Very High
			1	2	3	4	5
Likelihood	1	Very low probability <10%	Low risk Acceptable 2	Low risk Acceptable 3	Moderate risk Tolerable 4	Moderate risk Tolerable 5	Critical Risk Requires Control 6
	2	Low probability 10%-39%	Low risk Acceptable 3	Moderate risk Tolerable 4	Moderate risk Tolerable 5	High Risk Manageable 6	Critical Risk Requires Control 7
	3	Medium probability 40%-59%	Low risk Acceptable 4	Moderate risk Tolerable 5	High Risk Manageable 6	High Risk Manageable 7	Critical Risk Requires Control 8
	4	High probability 60%-90%	Moderate risk Tolerable 3(4) = 5	Moderate risk Tolerable 6	High Risk Manageable 7	High Risk Manageable 8	Critical Risk Requires Control 9
	5	Almost Certain >90%	Moderate risk Tolerable 3(4) = 6	High Risk Manageable 7	High Risk Manageable 8	Critical Risk Requires Control 9	Critical Risk Requires Control 10

Table 9.1 Risk Severity Matrix

9.5 Risk Response Development:

Risk response can be classified into four situations which are shown below

- Avoidance: Changing the original plan to eliminate all causes of risk and avoid risk.
- Mitigation: Mitigate risks by reducing the likelihood of the risk occurring.
- Accept: Conducting risk identification and recording all risks, but do not act unless risk occurs.
- Transfer: Transfer risk to a third party such as buying insurance and letting insurance take the risk.

9.6 Risk Response Control:

Risk response control is a process of prioritizing risk over other elements of management discussions and is subject to periodic review. Risk response controls are mainly divided into three parts, which include continuous monitoring, control, and improvement. To be more specific, both resolved risks and new risks should be recorded. It will ensure all risk control measures can be integrated and identify changes in risk and risk control measures, which is help project teams to take appropriate actions. The suggestion for conducting risk response control is shown below.

- Holding risk review meetings every week and discussing identification, initiation, and implementation of mitigation for each item in the project.
- Establishing a risk control team and monitoring the progress of implementation of risk control measures.
- Updating project risk and risk register.

Risk register:

Risk ID related to WBS	Risk description	Risk Owner	Impact	Likelihood	Severity	Risk value	Response management strategies	Mitigation	Contingency plan
1.7	The quality of gas pipelines construction does not meet project specifications or expectations	Project team	Project delays and affects project quality	4	5	9	Mitigate	Daily quality inspection of pipeline installation progress	Technical risk solution
1.3.1	The disruption of the supply chain led to difficulties sourcing materials or equipment	Project team	Delays the project	4	5	9	Transfer	Reserve additional flexible time and funds when planning the schedule of tasks. Finding additional supply chains during project initiation.	Reschedule
1.1.3	The project's budget does not cover the cost of the project	Project team	Affects project scope and budget	3	5	8	Mitigate	Make a maximum budget and Reserve funds when planning the schedule of tasks.	Contingency funding
1.5.1.1 1.5.2.1	Supplier delays delivery of raw materials	Project team	Delays the project	3	5	8	Transfer	Reserve additional flexible time and funds when planning the schedule of tasks.	Reschedule
1.2.1	The project was rejected by the Indonesian energy department or violated the legal requirements of the local environmental department	Project team	Project delays	4	4	8	Avoid	Hire legal counsel and circumvent violations during construction	Reschedule
1.1.4	The investment from shareholders is reduced	Project team and sponsor	Affects project scope and budget	3	5	8	Mitigate	Provide specific funding usage and the lowest budget to persuade shareholders to increase investment	Contingency funding
1.7.2.2	Damage to fabrication equipment and Pipeline	Project team	Delays the project	3	4	7	Mitigate	Avoid inappropriate use of equipment	Technical risk solution

1.8	There is no professional technician to test the quality of the pipeline	Project team	Project delays and affects project quality	2	5	7	Mitigate	Hire extra technicians when employing staff	Technical risk solution
1.2.2	A dangerous site environment threatens the personal safety of staff	Project team	Affects project scope	3	4	7	Mitigate	Conduct site safety tests	Technical risk solution
1.3.3	Machinery procured from suppliers cannot meet installation regulation	Project team	Project delays	3	4	7	Transfer	Choose reputable suppliers	Reschedule
1.1.1	Lack of communication among team members leads to slow project progress	Project team	Project delays	3	4	7	Mitigate	Develop meeting plans and summarize daily work	Reschedule
1.4.2 1.4.3	Using some advanced and immature technologies which are not necessary for the project	Project team	Project delays and affects project quality	3	3	6	Avoid	Apply developed installation technology	Technical risk solution
1.8.3	Unnecessary toxic substances are produced during construction.	Project team	Project delays affect project quality	3	3	6	Mitigate	Toxic substance Tests on pipelines	Technical risk solution
1.7.1.1	Staff may suffer from flu, diarrhea, heatstroke, and other diseases during construction	Project team	Project delays	3	3	6	Mitigate	Maintain a hygienic work environment	Reschedule
1.9.3	Pipelines are not correctly maintained	Project teams	Project delays	1	4	5	Mitigate	Conduct maintenance workers training for new workers	Technical risk solution
1.3.2.2	Staff resigns or cannot participate in the project due to force majeure	Project team	Project delays	3	2	5	Active accept	Allow rest staff to work overtime	Reschedule
1.9.2	The safety of undersea pipelines is not supervised	Project team	Project delays	2	2	4	Mitigate	Conduct supervisor training every two weeks for the new supervisor	Technical risk solution

Table 9.2 Risk Register

Appendix

Appendix 1 Stakeholder and Communication Management

STAKEHOLDER REGISTER									
Stakeholder Name	Project Role	Project Involvement	ENI Association	Organization	Contact Details			Latest Comment	Next Comment
					Email	Phone	Preferred Method		
Hasliza Omar	Sponsor	Primary	External	Private Companies	H.O@163.com	+61 xxx xxx xxx	Mobile and Email	(enter date)	(enter date)
Director Lee	Director of Installation contractors & Fabricators	Primary	External	Technip FMC	Lee@163.com	+61 xxx xxx xxx	Mobile and Email	(enter date)	(enter date)
Manager Liu	Pipeline vendors	Primary	External	Private Companies	Liu@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
CT construction team	Installation crew	Secondary	External	Private Companies	CT@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
project direct Tim	client	Primary	External	Pertamina	Tim@163.com	+61 xxx xxx xxx	Mobile and Email	(enter date)	(enter date)
Director Daniel	Environmental inspector	Primary	External	Indonesia State Ministry of Environment and Forestry	Daniel@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
Director James	Project Supporter	Primary	External	Bakau Port Authority	James@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
Inspector Tom	Project Supporter	Primary	External	Environmental Organisations	Tom@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
Manager Jack	Project Collaborator	Secondary	External	Indonesian Ministry of Manpower and Transmigration	Jack@163.com	+61 xxx xxx xxx	Email	(enter date)	(enter date)
Local communities	Project Supporter	Secondary	External	Public Sector	Community Website			(enter date)	(enter date)
Project Management Team	Project Manager	Primary	Internal	ENI	Group 5@163.com	+61 xxx xxx xxx	Mobile and Email	(enter date)	(enter date)

Table 1: Stakeholder Register

STAKEHOLDER ANALYSIS AND MANAGEMENT							
Identified Stakeholder	**Power**	**Interest**	**Project Goals**	**Stakeholder Contribution**	**Engagement Level**	**Organizational Capabilities**	**Action Plan**
Project Sponsor	5	4	Provide resources for the project	Authorize changes to the scope	Empower	Maintain Engagement	Maintain project progress
Director of Installation contractors & Fabricators	4	3	Design, manufacture and install advanced systems or products for the project	Assist the project team to complete the installation task	Involve	Meet Their Needs	Make a forward plan in advance and check regularly
Pipeline vendors	2	2	Provide qualified and suitable pipeline	Provide resources required for the project	Inform	Manage Expectations	Align targets and track project status
CT construction team	1	1	Responsible for specific installation	Potential Project Collaborator	Monitor	Monitor Perception	Keep the installation task completed within the specified time
Pertamina(client)	4	5	Needs are satisfied	Work with the project team for the Standards	Empower	Maintain Engagement	Put forward requirements in advance and check regularly
Environmental inspector	4	4	Monitor the environmental impact of projects	Potential Project Supporter	Collaborate	Maintain Engagement	Always keep participate and supervise
Director of Bakau Port Authority	4	4	Approve and support the project	Potential Project Supporter	Collaborate	Maintain Engagement	Always keep participate and supervise
Inspector of Environmental organizations	4	3	Monitor the environmental impact of projects	Potential Project Supporter	Involve	Meet Their Needs	Always keep participate and supervise
Indonesian Ministry of Manpower and Transmigration	2	1	Provide staff	Potential Project Collaborator	Monitor	Monitor Perception	Monitor the project through general communications
Local communities	1	1	No direct goal	Potential Project Collaborator	Monitor	Monitor Perception	Monitor the project through general communications
Project Management Team	3	5	Control project budget schedule and deliverable	Manage the project and keep in touch with other principals	Collaborate	Maintain Engagement	Check dynamics, provide resources, and track project

Table 2: Stakeholder analysis and management

POWER	DEFINITION	DEFINITION
5	Very High	The stakeholder can manage the progress of the project and/or have a large effect on the project.
4	High	This stakeholder may have some impact on the budget, process, and scope of the project.
3	Moderate	This stakeholder may have a slight impact on the budget, process, and scope of the project.
2	Low	This stakeholder may monitor the project, but cannot affect the project.
1	Very Low	This stakeholder has no direct impact on the project.

Table 3: Definition of the Different Power

INTEREST	DEFINITION	DEFINITION
5	Very High	The stakeholder is highly supportive of the project and needs to keep track of the progress of the project.
4	High	This stakeholder has very much supported the project and pays attention to this result.
3	Moderate	The stakeholder is paid attention to the benefits of this project and hopes it will be successful.
2	Low	The stakeholder focuses on the benefits of this project and hopes it will be successful, but does not feel strongly.
1	Very Low	This stakeholder is either not interested or has a reservation for the project.

Table 4: Definition of the Different Interests

	Power >				
Rating	**1**	**2**	**3**	**4**	**5**
5	Consult	Involve	Collaborate	Empower	Empower
4	Inform	Consult	Involve	Collaborate	Empower
3	Inform	Consult	Consult	Involve	Collaborate
2	Monitor	Inform	Consult	Consult	Involve
1	Monitor	Monitor	Inform	Inform	Consult
Interest ^					

Table 5: Stakeholder Engagement Decision Matrix

STRATEGY	CLASSIFICATION	DEFINITIONS
Empower	Maintain	Authorize this stakeholder to manage the project and maintain their participation in the project.
Collaborate		Work with other stakeholders to arrange project details and keep improving in real-time.
Involve	Meet	Give some professional advice to help another stakeholder to complete the project. Either retain or upgrade to Maintain Classification.
Consult		Provide valuable feedback when consulting with project decision-makers. Either retain or upgrade to Maintain Classification.
Inform	Manage	Provide valuable information related to the project regularly. Either retain or upgrade to Meet Classification.
Monitor	Monitor	Track stakeholders' opinions and monitor rating in Power and Interest Level. The goal is to at least upgrade to the Desired Classification.

Table 6: Four Organizational Capabilities and Definitions

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