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Implementation Contractor Safety Management System (CSMS) for Repair Road Project at PT. Pertamina EP Tanjung Field South Kalimantan

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***Abstract*—** A *Contractor Safety Management System (CSMS) is a system used to ensure that contractors who partner with PT. Pertamina EP Tanjung Field, South Kalimantan, has implemented a Health Safety and Environment (HSE) management system according to the specified requirements. This research aims to analyze the implementation of CSMS in road improvement projects in PT. Pertamina EP Tanjung Field, starting from the qualification stage to the contractor evaluation stage. This research uses quantitative and qualitative methods to determine the assessment of the implementation of the CSMS of the road improvement project. The research result is the CSMS of road repair projects in the PT. Pertamina EP Tanjung Field has been implemented well, and from the qualification stage to the implementation stage, it is by Pertamina's Work Procedure System (WPS). The results of the final assessment of the contractor obtained a score of 58.2% > 54.3%, so the contractor was declared to have completed the work well and passed the minimum standards for medium-risk work. Thus, the contractor can immediately prepare a report on the inspection and handover of work. The contractor was also stated to have implemented the HSE according to plan and was recommended to take part in the qualification stage for the next project within the Indonesian Oil and Gas Contractor Cooperation Contract (CCC).*

***Keywords*—** *Contractor Safety Management System, Health Safety and Environment, Pertamina's Work Procedure System.*

I. INTRODUCTION

PT Pertamina EP Tanjung Field is a mining company engaged in the oil and gas sector, which in its business process has a big target to achieve occupational safety and health in the Company's environment. In the business process, the company must pay great attention to the management of occupational safety and health by implementing the Contractor Safety Management System (CSMS) in every work carried out by contractors in the Company's work environment.

The Contractor Safety Management System (CSMS) is a system created to ensure that contractors who partner with PT Pertamina and other subsidiaries have a Health Safety and Environment (HSE) management system by the HSE requirements applicable at PT Pertamina and can implement HSE requirements in the work contracts carried out.

In 2020, PT Pertamina EP Tanjung Field repaired the environmental roads of the complex, including Sele Road, Permata Road, and Intan Road. The work has a high risk of work accidents because the work location intersects directly with the mobilization of company vehicles, so there is a risk of collision, fire during the asphalt burning process, and congestion or other disturbances. Therefore, good monitoring and implementation of CSMS are needed to create zero accidents.

This research aims to assess the implementation of CSMS in road construction projects within PT. Pertamina EP Tanjung Field from qualification to implementation, including making risk assessments for tenders, analyzing the determination of tender winning contractors, evaluating the implementation of the HSE Plan in the process of the work, and evaluating contractor performance in implementing the HSE Plan in the field.

II. HERITAGE OVERVIEW

A Contractor Safety Management System (CSMS) is a management system to manage contractors who work within the company where the contractor runs the contract. CSMS is a comprehensive system for managing contractors from the planning stage to the implementation of the work.

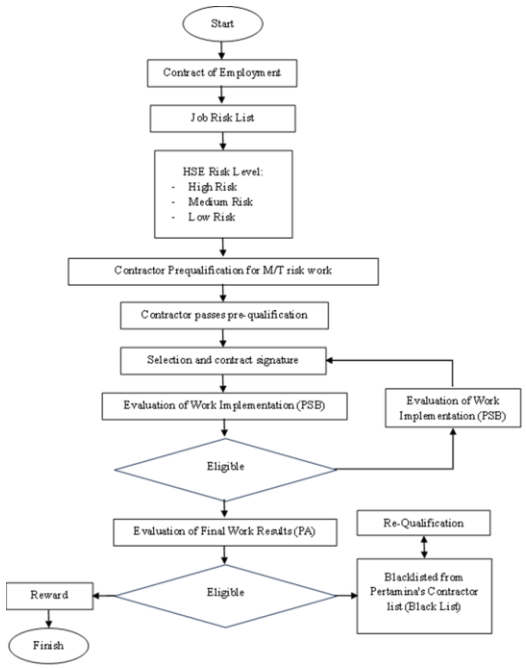

Figure 1. CSMS Flowchart of PT Pertamina EP Tanjung Field

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A. Stages of Contractor Safety Management System (CSMS) Implementation

In the implementation of CSMS, there are 6 stages of implementation, including:

1. Risk Assessment
   Risk assessment is conducted using the Risk Assessment Matrix. The Project Planner does a risk assessment of the project it's preparing, The Planner can also use a data bank of jobs that are risk assessment available in Contract Administration or Centralized Integrated Vendor Database (CIVD) documents.
2. Qualification Assessment (QA)
   This qualification assessment process aims to screen potential contractors who have HSE systems in place and implement them consistently in the workplace so that it can eliminate contractors who fall short of the HSE system value standard PT. Pertamina EP (2019). They are the following qualification requirements:
   A. Knockout evaluation: ≥ 60% on a 100% scale; a score below 60% will be directly knocked out in pre-qualification
   B. Evaluation of point system: The weight of the occupational safety health and environmental protection (OHSE plan) is 20–30% of the overall evaluation (Technical and HSE Plan). The assessment passing grade for technical bidding documents and occupational safety health and environmental protection (OHSE) is determined by the Job Planner.
3. Selection
   The procurement process is carried out by the auction method (knockout and point system) and direct selection. The selection stage checks the suitability of the HSE Plan submitted in the offer of goods and services providers against the scope of work tendered. After several contractors have passed the pre-qualification, the contractor must submit an offer document equipped with an HSE Plan stage pre-qualification stage that has passed the pre-qualification. The HSE Plan will be one of the assessment weights in determining the winner of the tender, especially those using the knockout system (PT. Pertamina EP 2019)
4. Pre-Work Assessment (PWA)
   The pre-job assessment aims to ensure the HSE Plan has been communicated to all parties and ensure the readiness of the Contractors' resources before implementation of the contract. Pre-Work Assessment (PWA) has two steps, which are Pre-Mobilization and Mobilization activities, by following the PT Pertamina EP Organizational Work Procedure (OWP) – Implementation of Pre-Work Assessment (PWA) Number B-012/A3/EP0300/2020-S9.
5. Running Assessment (RA)
   The running assessment at the CSMS stage ensures that the work carried out is carried out according to the HSE Plan and other HSE requirements discovered during the execution of the work. There are 2 ways to conduct a walk-through assessment, namely conducting field inspections (inspection work practices) and examining walk-through assessment documents. RA evaluation can be carried out several times according to the duration of the contract, and the result of the Running Assessment is a requirement in making the Minutes of Handover of Work (MHW) < 100% for the term billing process.
   The total score of the Running Assessment is calculated with the following formula: Total PB value = (70% Value from Running Assessment) + (30% OHSE Qualification Value). The minimum value of Ongoing Assessment is 60% for the high-risk level and 54,3% for the Medium-Risk level.
   If the result of the Walk-through Assessment entered in the CIVD/OHSE Data Bank does not meet the requirements minimum score, then the HSE qualification assessment of the Contractor's knockout.
6. Final Assessment (FA)
   The final assessment aims to evaluate the entire implementation of HSE aspects during the work. The total score of the following formula: Total Score PA = (70% of the Final Assessment Score + 30% OHSE Qualification Score or Score Last RA).
   The minimum Final Assessment score is > 60% for level high and ≥ 54,3% for level Medium. Risk The result evaluation is entered into the Electronic Contractor Health Safety Environment Management System (e-CHSEMS) at the end of the contract as HSE Qualification Assessment results on an ongoing basis. If the entered Final Assessment (FA) results do not meet the minimum value, the HSE Qualification Assessment (PK) or the Contractor's SMHSE certificate is automatically knocked out. The Final Assessment results will be used as consideration for contractor selection on future projects and awards.

TABLE 1. Final Assessment of PT Pertamina EP

No.	Element	Value					Weight / Percentage	Value
		A = 0	B = 3	C = 6	D = 10	N/A		
A. OHSE Plan								
1	Leadership and commitment*						10%	0
2	OHSE Policy and Strategic Objectives*						10%	0
3	Organization, Responsibility, Resources, Standards and Documentation							
3.1	Organizational Structure and Responsibilities						1/4	0
3.2	OHSE Meeting						1/4	0
3.3	Training						1/4	0
3.4	OHSE Regulations and Standards						1/4	0
Element 3 Sub Total							10%	0
4	Risk Management							
4.1	Risk Assessment and Control* (Check Work Practice Inspection results)						1/8	0
4.2	Occupational Health Hazards						1/8	0
4.3	Occupational Safety Hazards						1/8	0
4.4	Hazards to Logistics Activities						1/8	0
4.5	Environmental Hazards						1/8	0
4.6	Hazard to Security						1/8	0
4.7	Hazards to Social Aspects						1/8	0
4.8	Personal Protective Equipment (PPE)						1/8	0
Element 4 Sub Total							10%	0
5	OHSE Work Procedures							
5.1	OHSE Operation Manual*						1/4	0
5.2	Infrastructure and Equipment Reliability						1/4	0
5.3	Change Management						1/4	0
5.4	Emergency Response Implementation						1/4	0
Element 5 Sub Total							10%	0
6	Implementation and Utilization of OHSE Performance							
6.1	Implementation of OHSE Management System and Active Performance Utilization						1/3	0
6.2	OHSE Performance Monitoring						1/3	0
6.3	OHSE Incident Investigation and Follow Up						1/3	0
Element 6 Sub Total							10%	0
7	Occupational Health Safety and Environmental Management System (OHSEMS) Audit and Management Review							
7.1	Audit						1/2	0
7.2	OHSEMS Management Overview						1/2	0
Element 7 Sub Total							10%	0
OHSE PLAN SUB TOTAL							70%	0
B. OHSE QUALIFICATION VALUE OF CIVD							30%	0
C. TOTAL FA VALUE							100%	0

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III. Research Methodology

This research uses qualitative and quantitative methods to determine the HSE Plan that has been agreed upon and then analyze the achievements of implementation CSM on road repair projects in the PT Pertamina EP Tanjung Field area in South Kalimantan. Analysis of the overall CSMS implementation is carried out using the basis of Pertamina's. Work Procedure System (WPS). The data presented is primary and secondary. The analysis is carried out step by step according to the stages of CSMS implementation, risk consisting of assessment, qualification assessment (QA), selection, pre-work assessment (PWA), running assessment (RA), and final assessment (FA) on contractors who participate and qualify.

IV. Result and Discussion

The overall analysis of CSMS implementation is carried out using the basis of Pertamina's. Work Procedure System (WPS). The data presented are primary and secondary. The analysis is carried out step by step according to the stages of CSMS implementation, risk, which consists of assessment qualification assessment (QA), selection, pre-work assessment (PWA), running assessment (RA), and final assessment (FA).

A. Risk Assessment

The risk assessment for the road improvement project is presented in the following table:

TABLE 2. Risk Assessment of Matrix Potential Hazards from The Social Environment

Severity Level	CONSEQUENCES					PROBABILITY OF OCCURRENCE				
	Human		Tools	Environment	Image	A	B	C	D	E
	Health	Safety				Never happened in the oil exploration and production (E&P) industry	Ever happened in the international E&P industry 1x in 1 year	Ever happened in Indonesia's E&P industry 1x in 1 year	Ever happened several times in 1x in 1 year in Indonesia E&P industry (1x per year)	Ever happened several times in 1 month in Indonesia E&P industry (1x per month)
1	Presence of one/some form of exposure	First aid	Mild disruption, with a financial loss of <US 100K	Mild impact	Mild impact	X				
2	Mild health effects/improvement	There are special records/ notes	Moderate disruption with a financial loss of US 100K-1M	Future impacts and localised damage	Limited impact	X		XX		
3	Medium effects that are fixed	There are cases of defects	Moderate disruption with a financial loss of US 1M-10M	Localized damage impact	Moderately large/local impact					
4	Severe health effects that are permanent and life-threatening	1 death & multiple permanent partial disabilities	Serious disruption with financial loss of US 10M-100M	Impacts with extensive damage	National impact					
5	Occurrence of some severe health effects that are permanent and life-threatening	Many deaths	Serious disruption, with a financial loss of ≥ US 100M	Big Impact	International impact					

(PT. Pertamina EP 2019, p.5)

From Table 2, it is obtained that the potential hazards of the social environment are a light risk because all items enter the green zone, where the field implementation is guarded by security, contractors, and internal Pertamina Tanjung Field so that the danger from the surrounding community can be anticipated.

Based on the overall risk assessment of the work, site materials, equipment, potential hazards from other contractors at the same time, the time and place of working hours, and potential hazards from the social environment around the work, this is a project of medium risk.

B. Qualification Assessment (QA)

The following are the results of the qualification assessment of contractors who participated in the pre-qualification stage, including the qualification scores of several contractors who passed and did not pass to proceed to the selection stage and obtain a CSMS certificate as a condition for participating in the next stage of the tender.

TABLE 3. Recapitulation of Pre-Qualification Score

No.	Name of the Company	Risk Level	Contractor Qualification Assessment Standard	Contractor Qualification Score	Qualification Status
1	PT. A	Medium Risk	≥ 60%	74,76%	Passed
2	PT. B	Medium Risk	≥ 60%	67%	Passed
3	PT. C	Medium Risk	≥ 60%	54,59%	Not Passed

C. Selection

From the results of the HSE Plan selection and technical documents and contract price bidding, the qualifications with the value of the financial offer are still below the owner estimate, namely PT. A, while PT. B is disqualified.

TABLE 4. Recap Table of Selection Assessment Results

No.	Nama Perusahaan	Risk Level	Contractor Qualification Assessment Standard	Contractor Qualification Score	Qualification Status
1	PT. A	Medium Risk	≥ 70%	73,92%	Passed
2	PT. B	Medium Risk	≥ 70%	61%	Not Passed

D. Pre-Work Assessment (PWA)

At this stage, contractors who have passed. The winner of the tender has made an HSE Plan for the work to be carried out Carry out a call to a kick-off meeting with the work, supervisor HSSE (health, safety, security, and environment) function, SCM (supply chain management) function, and other related functions to discuss the finalization of the HSE Plan adjustment document bridging document) so that the duties and responsibilities of the parties can be understood.

After the document is mutually agreed upon, PT Pertamina EP Tanjung Field and contractor PT. A will conduct a work site orientation and explain the finalized HSE Plan document according to existing field conditions and will conduct a pre-run assessment before the mobilization of work takes place.

From the results of this assessment, PT. A has met the readiness to carry out work in the field and can mobilize equipment and materials to be worked on.

E. Running Assessment (RA)

Stage assessment running was carried out during the implementation of work by the PT. Pertamina EP team to the contractor, to ensure that the work carried out is carried out by HSE Plan and HSE (Health, safety, and environment) needs.

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The results of PT. A's walk-through assessment is shown in the following table:
The result of PT. A's current assessment is 55.55 > the minimum standard for a moderate risk current assessment is 54.3. Thus, the value of PT. A's current assessment is still eligible.

TABLE 5. Running Assessment Form PT. A

No.	Element	Value				N/A	Weight / Percentage	Value
		A = 0	B = 3	C = 6	D = 10			
A. OHSE Plan								
1	Leadership and commitment*			6			10%	0.6
2	OHSE Policy and Strategic Objectives*			6			10%	0.6
3	Organization, Responsibility, Resources, Standards and Documentation							
3.1	Organizational Structure and Responsibilities				10		1/4	2.5
3.2	OHSE Meeting			6			1/4	1.5
3.3	Training		3				1/4	0.75
3.4	OHSE Regulations and Standards			6			1/4	1.5
Element 3 Sub Total							10%	0.625
4	Risk Management							
4.1	Risk Assessment and Control* (Check Work Practice Inspection results)			6			1/8	0.75
4.2	Occupational Health Hazards			6			1/8	0.75
4.3	Occupational Safety Hazards			6			1/8	0.75
4.4	Hazards to Logistics Activities		3				1/8	0.375
4.5	Environmental Hazards		3				1/8	0.375
4.6	Hazard to Security			6			1/8	0.75
4.7	Hazards to Social Aspects		3				1/8	0.375
4.8	Personal Protective Equipment (PPE)				10		1/8	1.25
Element 4 Sub Total							10%	0.5375
5	OHSE Work Procedures							
5.1	OHSE Operation Manual*			6			1/4	1.5
5.2	Infrastructure and Equipment Reliability			6			1/4	1.5
5.3	Change Management		3				1/4	0.75
5.4	Emergency Response Implementation			6			1/4	1.5
Element 5 Sub Total							10%	0.525
6	Implementation and Utilization of OHSE Performance							
6.1	Implementation of OHSE Management System and Active Performance Utilization		3				1/3	1
6.2	OHSE Performance Monitoring		3				1/3	1
6.3	OHSE Incident Investigation and Follow Up		3				1/3	1
Element 6 Sub Total							10%	0.3
7	Occupational Health Safety and Environmental Management System (OHSEMS) Audit and Management Review							
7.1	Audit		3				1/2	1.5
7.2	OHSEMS Management Overview	0					1/2	0
Element 7 Sub Total							10%	0.15
OHSE PLAN SUB TOTAL							70%	33.375
B. OHSE QUALIFICATION VALUE OF CIVD			73.92				30%	22.176
C. TOTAL FA VALUE							100%	55.551

F. *Final Assessment (FA)*

The final assessment is done when the work has ended to evaluate the entire implementation of HSE aspects during the work. The results of this final evaluation will be used as a consideration for contractor selection on future projects and other awards.

TABLE 6. Final Assessment Form

No.	Element	Value				N/A	Weight / Percentage	Value
		A = 0	B = 3	C = 6	D = 10			
A. OHSE Plan								
1	Leadership and commitment*				10	10%	10%	1
2	OHSE Policy and Strategic Objectives*			6		10%	10%	0,6
3	Organization, Responsibility, Resources, Standards and Documentation							
3.1	Organizational Structure and Responsibilities				10	1/4	1/4	2,5
3.2	OHSE Meeting			6			1/4	1,5
3.3	Training			6			1/4	1,5
3.4	OHSE Regulations and Standards			6			1/4	1,5
Element 3 Sub Total							10%	0,7
4	Risk Management							
4.1	Risk Assessment and Control* (Check Work Practice Inspection results)			6			1/8	0,75
4.2	Occupational Health Hazards			6			1/8	0,75
4.3	Occupational Safety Hazards			6			1/8	0,75
4.4	Hazards to Logistics Activities		3				1/8	0,375
4.5	Environmental Hazards			6			1/8	0,75
4.6	Hazard to Security			6			1/8	0,75
4.7	Hazards to Social Aspects			6			1/8	0,75
4.8	Personal Protective Equipment (PPE)				10		1/8	1,25
Element 4 Sub Total							10%	0,6125
5	OHSE Work Procedures							
5.1	OHSE Operation Manual*			6			1/4	1,5
5.2	Infrastructure and Equipment Reliability			6			1/4	1,5
5.3	Change Management		3				1/4	0,75
5.4	Emergency Response Implementation				10		1/4	2,5
Element 5 Sub Total							10%	0,625
6	Implementation and Utilization of OHSE Performance							
6.1	Implementation of OHSE Management System and Active Performance Utilization		3				1/3	1
6.2	OHSE Performance Monitoring		3				1/3	1
6.3	OHSE Incident Investigation and Follow Up		3				1/3	1
Element 6 Sub Total							10%	0,3
7	Occupational Health Safety and Environmental Management System (OHSEMS) Audit and Management Review							
7.1	Audit		3				1/2	1,5
7.2	OHSEMS Management Overview		3				1/2	1,5
Element 7 Sub Total							10%	0,3
OHSE PLAN SUB TOTAL							70%	41,375
B. OHSE QUALIFICATION VALUE OF CIVD			55.51				30%	16,653
C. TOTAL FA VALUE							100%	58,028

From Table 6, it is obtained that the final assessment of PT. A's performance gets a final score of 58.028 > 54.3% (minimum standard value for medium-risk work). Thus, contractor A is declared to have completed the work properly so that it can make the minutes of inspection and handover of work.

V. CONCLUSION

From the analysis that has been done, it can be concluded that:

1. Implementation of CSMS on road repair objects in the area PT. Pertamina EP Tanjung Field South Kalimantan has been well implemented starting from the risk, assessment stage qualification assessment, selection, pre-work assessment, running assessment, up to the final assessment stage
2. Contractor PT. A, as the executor of the work, is declared to have completed the work properly due to the final assessment result of 58.2% exceeding the minimum standard for medium-risk work (54.3%). Thus, the contractor can immediately make the minutes of the inspection and handover of work.
3. Contractor PT. A is declared to have implemented HSE as planned and recommended to follow stage qualification on the project subsequently in the Contracting Officer's environment Indonesia's oil and gas Contractor Cooperation Contract (CCC).

REFERENCES

[1] Falenshina N, "Implementation of Contractor Safety Management System (CSMS) towards Contractor Project TA Unit CD III PT. Pertamina RU III Palembang," M.S. thesis, FKM., University of Indonesia., Depok., Indonesian, 2012.
[2] Mardiah A, "Review of the Implementation of the Contractor Safety Management System (CSMS) for Contractors in the at the Construction of Stockpile Tanks Medan Fuel Terminal Group of PT Pertamina (Persero) in 2016," M.S. thesis, Faculty of Public Health., University of North Sumatera., Sumatera., Indonesian, 2017.
[3] Individual Work Procedure C-020/A3/EP0300/2018-S0 rev.2 HSE Work Practice, 2nd ed., PT. Pertamina EP Co., Jakarta, Indonesian, 2018.
[4] Individual Work Procedure C-017/A3/EP0300/2019-S9 Risk Assessment, 1st ed., PT. Pertamina EP Co., Jakarta, Indonesian, 2019.
[5] Organizational Procedures for the Implementation of Contractor Safety Management System, 1st ed., PT. Pertamina EP Co., Jakarta, Indonesian, 2019.
[6] Contractor Safety Management System, 1st ed., PT. Pertamina Hulu Energi Co., Jakarta, Indonesian, 2020.
[7] Purnama R, "Study Evaluation Level Fulfillment of Contractor's Occupational Safety and Health Management System ((SMK3) at China National Offshore Oil Corp CNOOC) 2000 - 2002," M.S. thesis, FKM., University of Indonesia., Depok., Indonesian, 2003.
[8] Ramli, "Process Safety Management Risk Based Process Safety Management for Oil Gas and Petrochemical Industries," Prosafe Institue Safety Development Foundation., Jakarta., Indonesian, 2017.
[9] Special Task Force for Upstream Business Activities Oil and Gas, "Work Procedure Guideline-005/SKKMA0000/2018/S0 on Management of Occupational Health Safety," SKK Oil and Gas., Jakarta., Indonesian, 2018.
[10] Decree, PT. Pertamina Persero, "Management Performance of Goods/Service Providers," PT. Pertamina Persero., Jakarta., Indonesian, 2010.
[11] Organization Work Procedure PT. Pertamina RU III, "Implementation of Contractor Safety Management System," PT. Pertamina RU III., Jakarta., Indonesian, 2011.

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