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Gap Analysis of the Environmental Management System Performance of PT. XXX to ISO 14001:2015 Standard

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ABSTRACT

PT. XXX is one of the oil and gas exploration companies in Indonesia operating in the Rokan Block of the Riau Province. To maintain the level of petroleum production in operation, PT. XXX adds oil and gas wells, improves, and improves operation reliability through upgrading several existing facilities; seen from the environmental setting at the current operational location activity has an impact on environmental components. To mitigate it, PT. XXX has developed an Environmental Management System (EMS) according to the international standard ISO 14001:2015. This quantitative descriptive research aims to determine the gap in QMS performance implemented by companies with ISO 14001: 2015 standards using seven clauses: Self-Assessment Checklist Internal Audit ISO 14001: 2015 GEMI 2015. To find out the Company's SML gap score with ISO 14001: 2015 standard is determined by the Gap Analysis method. The gap results from the 7 (seven) clauses analyzed to show the readiness score of SML PT. XXX to implement ISO 14001:2015 Standard is 98.83% refers to range gap analysis if the score range of 75% - 100% indicates PT. XXX is ready to complement EMS ISO 14001:2015 and carry out certification. The gap score between the Company's Environmental Management System (EMS) that is being implemented and the ISO 14001:2015 standard is 1.17%. The gap in clauses that have not met the requirements of SML ISO 14001: 2015 is Clause Support, which scores 95%, and Clause Performance Evaluation, which scores 96%.

Introduction

Oil and gas resources are strategically important, and their role is the central pillar in meeting national energy needs and national and international economic aspects. Petroleum energy is the primary energy source used in Indonesia (Rahmayanti, Rahmah, & Larashati, 2021). In addition to positively impacting economic growth, the mining sector can negatively impact social, environmental, political, and cultural life (Ridwan &

Mursyidah, 2023). For the management of these problems, it is necessary to implement an ISO 14001 Environmental Management System. QMS ISO 14001 is an environmental management system that plans, implements, and controls activities to improve a company's environmental protection (Purwanto et al., 2021). PT. XXX is one of the oil and gas exploration companies in Indonesia operating in the Riau province. To maintain the level of oil production in its operational area PT. XXX added oil wells and improved and improved operating reliability through repairs and construction of new facilities. Judging from the environmental setting at the existing operational site and the area activity plan, it impacts the environmental component. According to research (Ramadan, Hapsari, Pramesti, & Ikhlas, 2019). Every production activity in a company has the potential to cause environmental problems. This environmental problem includes air pollution, water pollution, soil pollution, waste and hazardous materials, noise and vibration, and radiation. To mitigate it, PT. XXX has developed an Environmental Management System (QMS) DSF Operating Area referring to the international standard ISO 14001:2015. ISO 14001 is an internationally recognized standard that sets out the requirements for an environmental management system. This standard helps organizations improve environmental protection, improve resource use efficiency, reduce waste, and gain competitive advantage and trust from stakeholders (Kurnianto, 2019).

Gap analysis is a tool or process that aims to identify differences between the current state of the organization and the requirements of the ISO 14001:2015 standard. The gap analysis method is the most appropriate method to find out and assess the company's current condition so that opportunities for improvement in the application of ISO 14001 can be known (Nurfida, Putra, & Usman, 2020). Gap analysis, as defined by the IT Infrastructure Library (ITIL), refers to comparing two data sets to identify differences. Gap analysis is crucial in work planning and evaluation. Gap analysis is a tool or process for identifying where the gaps lie and the differences between the current organizational situation and the current "what should happen".

According to research by (Utomo, Usman, & and Sridadi, 2002), Gap analysis can determine the mismatch between existing standards and organizational processes. Research (Isroqunnajah, Mustikawan, & Rofiq, 2022) states that the ISO 14001 Environmental Management System is a systematic approach to identify environmental aspects and impacts and formulate goals and objectives. Based on the research studies described, the Environmental Management System (SML) of PT. XXX Operating Area needs an in-depth study to find out the gap with the international standard ISO 14001:2015 (Hastuti & Hodijah, 2023).

Method

This research used a quantitative descriptive method. Researchers write, describe, and describe the actual state of the environmental management system (QMS), focusing on 7 ISO 14001: 2015 Clauses, namely Organizational Context Clauses, Leadership clauses, Planning clauses, support clauses, operating clauses, Performance Appraisal Clauses, and Remedial Clause.

Data Collection Methodology

According to (Hidayati & Sodikin, n.d.), research data collection methods can be carried out by field observation, planned interviews with respondents who have knowledge and experience to provide information related to QMS using the ISO 14001:2015 Internal Audit Checklist Self-Assessment guide, and company document review. In this study, researchers also applied the same method to collect research data.

Data analysis methodology

The data analysis method in quantitative descriptive research is carried out with the following steps:

1. The score of each ISO 14001:2015 Internal Audit Checklist Self-Assessment question refers to the Global Environmental Management Initiative (GEMI) 2015. Table 1. Conformity Score Fulfillment (Fikri, Zulkarnain, Afifah, & Firmansyah, 2023). If the requirement is not met, a score of 0 is partially met with a score of 1, and if the total requirement is completed, a score of 2.

Table 1
Conformity Value Fulfillment (GEMI:2015)

Score	Information
0	Requirements not met
1	Partially fulfilled requirements
2	Full requirements completed

The results of the scoring checklist, audit, and interview are processed using the GEMI:2015 application with the method of the number of values obtained from each question in the sub-clause, then added and divided according to the many questions, tn multiplied by 0% so that core for each clause is obtained.

$$\text{ctincore} = \frac{\text{Total uestion Score}}{\text{Total Sub l}} \text{ X } 10\% \text{causal} \frac{\text{Total Section Scor}}{\text{Tota lausal}} 0$$

In implementing 14001 205, the existing SML's description of the value range is set out in Table 2—range gap analysis. Meanwhile, to determine the percentage value of compliance with the ISO 14001: 2015 standard calculated based on the fulfillment score 100%-Gap Velue, the smaller the percentage of gaps obtained, the better.

Table 2
Gap range analysis

Score	Information
75%– 100%	The organization is ready to complete QMS ISO 14001:2015 and carry out certification.
50% – 74%	Organizations need to complete the QMS in preparation for ISO 14001:2015 certification.

1% – 49%	SML organization in need of improvement

Results and Discussion

Table 3 lists the results of document reviews, observations, and planned interviews with respondents with the knowledge and experience to provide information related to QMS that are being implemented using the ISO 14001:2015 Internal Audit Self-Assessment Checklist.

Table 3
Results of document reviews, observations, and interviews

CHECKSHEET AUDIT INTERNAL ISO 14001: 2015		Score0.1&2
	Parameter Audit	
4	Organizational Context	
4.1	Understand the organization and its context	2
4.2	Understand the needs and expectations of interested parties	2
4.3	Determine the scope of the environmental management system	2
4.4	Environmental management system	2
5	Leadership	
5.1	Leadership and commitment	2
5.2	Environmental policy	2
5.3	Roles, responsibilities, and authorities of the organization	2
6	Planning	
6.1.1	Actions to address risks and opportunities	2
6.1.2	Environmental Aspects	2
6.1.3	Compliance obligations	2
6.1.4	Planning actions	2
6.2.1	Environmental goals	2
6.2.2	Planning actions to achieve environmental goals	2
7	Backing	
7.1	Resources	2
7.2	Competence	1
7.3	Concern	1
7.4.1	Communication - General	2
7.4.2	Internal communication	2
7.4.3	External communications	2
7.5.1	Documented Information - General	2
7.5.2	Build and update (Documented information)	2
7.5.3	Control of documented information	2
8	Operational	
8.1	Operational planning and control	2
8.2	Emergency preparedness and response	2
9	Performance Evaluation	

9.1.1	Common	1
9.1.2	Compliance evaluation	2
9.2.1	Program audit internal	2
9.3	Management Review	2
10	Repair	
10.1	Common	2
10.2	Nonconformities and corrective actions	2
10.3	Continuous improvement	2

Table 3 shows that of the 31 sub-clauses analyzed, 28 (twenty-eight) sub-clauses get a score of 2, indicating the requirements of ISO 14001:2015 are fully completed, and 3 (three) sub-clauses that get a score of 1 (requirements are partially met) namely, sub-clause 7.2 competence, sub-clause 7.3 concern and 9.1.1 General.

Gap Analysis

The results of GEMI:2015 weighting are examined using the Gap Analysis method, which aims to determine the extent of the difference between the Company's environmental management system (QMS) that is being implemented with the ISO 14001: 2015 standard. The GEMI:2015 weighting and Gap analysis results are listed in Table 4 and Figure 1.

Table 4
Gap Analysis Klausul ISO 14001:2015

Checklist Section	***Section Score (%)***
Organizational Context	100%
Leadership	100%
Planning	100%
Backing	95%
Operation	100%
Performance Evaluation	96%
Repair	100%
Gap Score (98.83% = 692% / 7*100%)	**98.83%**
1.17% = 100% - 98.83%	**1.17%**

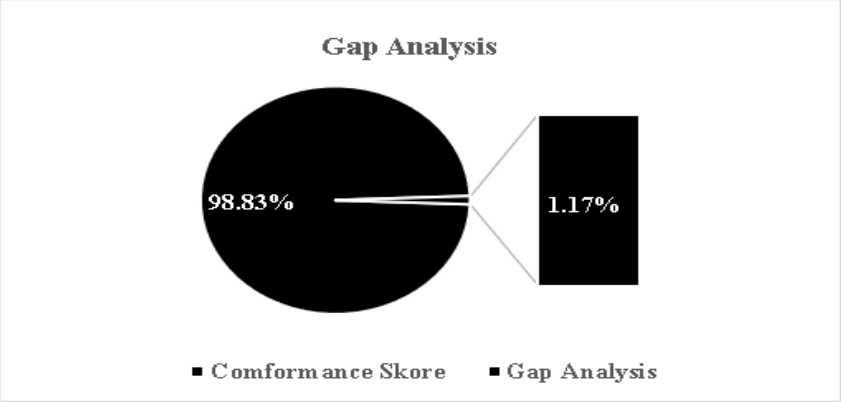

Figure 1. Gap Analysis

The results of the 7 (seven) clauses analyzed show the performance score of SML PT. XXX with ISO Standard 14001:2015 is 98.83%. Using the formula method, 98.83% = (688%)/7 x 100% refers to table 2 if the 75% - 100% score indicates PT. XXX is ready to complete SML ISO 14001:2015 and carry out certification. The score for fulfilling the company's environmental management system (QMS), which is being implemented with ISO 14001: 2015 standards, is 1.17%. The gaps in clauses that have not met the requirements of SML ISO 14001: 2015 are:

Clause 7. Support, score 95%, which is the gap in this clause is sub-clause 7.2 Competence, Documentation records of training and human empowerment (HR) competencies related to environmental management that reflect conformity with the needs are inaccessible to the author. Subclause 7.3. The concerns, policies, and principles of QMS have not fully reached all levels of workers.

Clause 9. Performance Evaluation, score 96%, which is the gap in Sub Clause 9.1.1 Monitoring, measurement, analysis, and evaluation; the data record of the calibration certificate of the monitoring and measurement tools of the essential elements of the QMS is not accessible to the author.

Conclusion

The results of the study of 7 (seven) clauses analyzed showed the performance score of SML PT. XXX in implementing ISO 14001:2015 Standard 98.83% refers to Range gap analysis if the score range of 75% - 100% indicates PT. XXX is ready to complete the SML gap and carry out ISO 14001:2015 certification. The fulfillment score for the company's environmental management system (QMS), which is being implemented with the ISO 14001: 2015 standard, is 1.17%. Clauses that have not met the requirements of ISO 14001:2015 SML are the Support Clause, which scored 95%, and the Performance Evaluation Clause, which scored 96%. The sub-clauses that have not met the requirements of QMS ISO 14001:2015 are sub-clause 7.2 Competence; the gap is a record of training documentation and human resources (HR) competencies related to environmental management that reflect conformity with the needs of the inaccessible author, Sub-clause 7.3. The concern is that the QMS policies and principles have not been fully reached at all levels of workers, and Sub Clause 9.1.1, which is the gap in monitoring, measuring, analyzing, evaluating, recording data calibration certificates, monitoring tools and measuring essential elements of QMS are not accessible to the author.

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