EVALUATION OF IMPLEMENTATION OF MINING SAFETY MANAGEMENT SYSTEM AT PT PUTRA MUBA COAL SUNGAI LILIN DISTRICT MUSI BANYUASIN REGENCY SOUTH SUMATERA PROVINCE

Lina Rianti[1*], Maria Puspa Sari[2], Wina Aulia Putri[3]

[1-3] Coal mining engineering, Akamigas Polytechnic Palembang, 30257, Indonesia
linarianti@pap.ac.id

Abstract: *Mining Safety Management System (SMKP in Indonesia) is a part of management system in mining safety risk control consisting of mining operation safety and mining worker healt and safety as well as a guidance for mining companies in Indonesia in implementing mining safety management system. The evaluation of SMKP Minerba had been regulated in laws and regulation, namely the Director General of Mineral and decree No.K/37.04/DJB/2019, and the evaluation of SMKP Minerba implementation consist of 7 elements of SMKP. The aim of the study was to determine the level of assessment of SMKP implementation and to find out the results of suitability of SMKP implementation at PT Putra Muba Coal. The researh method used was a qualitative method. The results of the evaluation of SMKP Minerba implementation at PT Putra Muba Coal obtained a percentage value of 27% out of the standar value of 100%. Among the 7 elements the policy element was 3%, the planning elements was 4%, the organizational and personnel elements was 10%, the implementation element was 8%, elements of monitoring, evaluation and follow-up was 8%, elements of documentation was 1% and elements of management review and performance improvement was 5%. And from the assesment, it was found 88 findings of discrepancy and 7 findings of conformity. From the results of this assesments, the company obtained a level of achivement of implementation fulfillments with a poor category and the company must make improvements by implementing all elements of SMKP Minerba in order to get a good value.*

Keywords: Risk, Mining Safety Management System, Discrepancy.

1. INTRODUCTION

1.1 Background

The analysis result of the evaluation level of the overall implementation of the mining safety management system (henceforth, SMKP) at PT Dasrat Sarana Arang Sejati Sejati based on Likert scale calculations was 89.5% [1]. The research results of SMKP at PT Sumber Energi Jaya using an analysis strategy indicated that the implementation of SMKP 72% and SPPLHP 80% could achieve goals at a proactive level and measuring employee perceptions of SMKP and SPPLHP is recommended to be high [2]. The research results on SMKP at PT Bukit Asam Tbk Tanjung Enim mining unit indicated that the supply of SMKP elements had reached 839.46 out of 1000 points (83.946%) [3].

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Based on the researches above, researchers were interested in researching the implementation of the mining management safety evaluation system at PT Putra Muba Coal.

1.2 Limitation of the Problem

The limitation of the problem was the evaluation activities at PT Putra Muba Coal, namely evaluating the implementation of the mining safety management system and internal audit of the mining safety management system at PT Putra Muba Coal.

1.3 Objectives of the Study

The objectives of this study were:

1. To determine the level of assessment of SMKP implementation based on the results of the internal audit of the mining safety management system at PT Putra Muba Coal.
2. To determine the results of the suitability and non-conformity of implementing SMKP at PT Putra Muba Coal.

1.4 Significance of the Study

The significances of this study were:

1. This research can be used as supporting data in implementing a mining safety management system at PT Putra Muba Coal.
2. This research can be a reference for companies and is expected to be evidence of the participation of the world mining business industry in efforts to develop the quality of education.

2. LITERATURE REVIEW

2.1 Definition of Safety Management

Safety Management refers to any forms of activities to ensure and protect employee safety through efforts to prevent work accidents and work-related diseases. A program created for employees and employers by recognizing things that have the potential to cause work accidents and illnesses due to work relations as well as anticipatory measures. The main cause of work accidents is the low commitment of management leaders and employee awareness of the company's K3.

The success of implementing safety in the mining industry highly depends on management's view of safety itself. This statement is based on the fact that there are still many views that implementing safety will actually multiply profits through preventing losses and increasing productivity. In fact, it is not an exaggeration if an industry that has a high risk, such as the mining industry, is of the view that implementing safety is the responsibility of a mining department or entrepreneur [4].

The advantanges of HSE Managemet are:

a. Protecting employees from suffering illness and disability, loss of work time and loss of financial income.
b. Protecting the family from sadness or distress, loss of financial income and an uncertain future.
c. Protecting the company from loss of labor, compensation costs due to accidents,

loss of time due to cessation of activities and reduced production of the company.

The basic framework for Occupational Safety and Health Management can be structured as follows:

a. The main functions of management include planning, organizing, implementing, controlling and making decisions related to Occupational Safety and Health. The examples of these five functions are determined by the company's basic concepts of Occupational Safety and Health.
b. The main management activities include financing and reporting, operations, product marketing and sales as well as communication and information systems. These activities are the targets and objectives that the company wants to achieve.
c. Resources and obstacles which include humans, material and equipment, consumer needs, community economic conditions, and the work environment and government regulations can be input to management activities and management functions..

According to the basic framework of Occupational Safety and Health Management mentioned above, the aim of Occupational Safety and Health is to prevent accidents or company losses by realizing each management function in carrying out activities that are limited by the resources or inputs available. The ten work safety guidelines are h:

1. Think about safety, work safely all the time.
2. Comply with regulations and safe work procedures. These rules are your protection.
3. Wear appropriate clothing and appropriate personal protective equipment.
4. Act properly at all times, no joking.
5. Think about safe methods before starting a job.
6. Only permitted tools and equipment may be used .
7. Check tools and equipment before starting work, for your safety.
8. Report to your supervisor immediately any unsafe conditions and methods.
9. Report any accidents to supervisors immediately.
10. Support work safety instructions and participate in work safety activities.

2.2 Mining Safety Management System Guidelines

The mining safety management system (SMKP) is part of the management system within the company, namely the IUP, IUPK, IPR and IUJP holders as a whole in order to control mining safety risks. This mining safety management system guideline is based on General of Mineral and Coal Decree No.185.K/37.04/DJB/2019 concerning technical instructions for implementing mining safety and implementation, assessment and reporting of mineral and coal mining safety management systems. This mining safety management system consists of mining occupational safety and health (K3) and mining operational safety (KO) [5].

According to the Decree of the Director General of Mineral and Coal No.185.K/37.04/DJB/2019, mining occupational safety and health are all activities to guarantee and protect workers to be safe and healthy through management of occupational safety, occupational health, work environment and occupational safety and health systems. Meanwhile, mining operational safety is all activities to ensure and protect mining operations so that they are safe, efficient and productive through system management and implementation efforts, maintenance and upkeep of mining facilities, infrastructure, installations and equipment.

Based on the guidelines for implementing SMKP Minerba, the guidelines consist of several elements, namely as follows:

1. Policy

In terms of policy elements, holders of exploration IUP, exploration IUPK, production operation IUP, production operation IUPK, and mining service companies follow the basic principles as follows:

a. Policy preparation
   In formulating policies, consider the results of the initial review and input from mining workers.
b. Contents of the policy
   includes vision, mission and goals; and committed to implementing K3 and KO mining.
c. Policy determination
   Legitimated by the highest leadership of the holder of an exploration IUP, exploration IUPK, production operations IUP, production operations IUPK or mining services company
d. Policy communication
   The results of policy determination are documented regularly and explained and disseminated to mining workers and people given entry permits by the head of mining engineering (KTT).
e. Policy review
   In the review by management, conditions are periodically adjusted to the established mining safety policies.

2. Planning

Holders of exploration IUP, exploration IUPK, production operation IUP, production operation IUPK, and mining service companies in preparing mining safety plans are guided by:

a. The results of the initial review process include:
   systematic business processes and process interactions; adjustments to the provisions of laws and regulations and standards and review of mining safety policies
b. Risk management
   The risk management process includes 5 (five) activities consisting of risk communication and consultation, determining the risk context, hazard identification and risk assessment, risk control, and monitoring and review.
c. Identification and compliance with statutory provisions and other related requirements
d. Determining goals, objectives and programs which include: creating, determining, implementing and maintaining, as well as documenting mining safety goals, targets and programs that are in line with policies and can be measured; and mining safety goals, objectives and programs are established and approved by the mining safety committee.
e. Work plans, budgets and costs determine work plans, budgets and costs for mining safety aspects that receive approval from the Director General on behalf of the Minister or Governor in accordance with their authority.

3. Organization and personnel

In organizational and personnel elements, follow the following guidelines:

a. Preparation and determination of organizational structure, duties, responsibilities and authority with provisions for the implementation of SMKP Minerba, mining safety organizational structure integrated into the organizational structure;
b. ppointment of KTT, head of underground mining, and/or head of dredger/suction vessel;
c. Appointment of PJO for mining services companies;
d. Establishment and determination of the mining K3 section and mining KO section;
e. Appointment of operational supervisors and technical supervisors;
f. Appointment of competent mining technical personnel;
g. Establishment and appointment of a mining safety committee;
h. Appointment of an emergency response team;
i. Selection and placement of personnel;
j. Organizing and implementing education and training as well as work competencies;
k. Preparation, determination and implementation of mining safety communications;
l. Mining safety administration management; And
m. Preparation, implementation and documentation of participation, consultation, motivation and awareness.

4. Implementasi

In conducting the implementation of the fulfillment of mining activities including:

a. Implementation of operational management;
b. Implementation of work environment management;
c. Implementation of occupational health management;
d. Implementation of mining KO management;
e. Management of explosives and blasting;
f. Determination of design and engineering systems;
g. Determination of purchasing systems;
h. Monitoring and management of mining service companies;
i. Emergency management;
j. Providing and preparing first aid for accidents; And
k. Implementing safety outside of work

5. Monitoring, Evaluation and Follow-up

To measure the success of the SMKP Minerba, it is necessary to monitor, evaluate and carry out follow-up actions on the results of the evaluation of the plan and implementation of the SMKP Minerba, as well as documenting them. In this case it is guided by:

a. Performance monitoring and measurement;
b. Inspection of mining safety implementation;
c. Evaluate compliance with statutory provisions and other related requirements;
d. Results of reports from investigations of accidents, dangerous incidents, incidents

resulting from occupational diseases, and data on records of occupational diseases;
e. Evaluation of mining safety administration management;
f. Internal audit of the implementation of SMKP Minerba; And
g. Improvement and follow-up plans.

6. Documentation

In the documentation element, holders of exploration IUP, exploration IUPK, production operation IUP, production operation IUPK, and mining service companies carry out the following:

a. Preparation of the SMKP Minerba manual;
b. Document control;
c. Recording control; And
d. Determination of document and record types.

7. Management Review and Performance Improvement

To assess improvements and the need for changes to the SMKP Minerba, the following are carried out:

a. A review of the follow-up results of the improvement plan can be used as a basis for management in determining policies for the process of improving mining safety performance ;
b. The management review is led by the permit holder's top management; and carried out periodically at least once a year and the results are documented

2.3 SMKP Regulation Framawork

Based on General Mineral and Coal Decree Number 185.K/37.04/DJB/2019 concerning technical instructions for implementing mining safety and implementation, assessment and reporting of mineral and coal mining safety management systems. Assessment of the implementation of SMKP Minerba or special SMKP in processing and/or refining is carried out with the following provisions:

1. Determination of an assessment of the application of SMKP Minerba or SMKP specifically for processing and/or refining. The weighting for each element in the SMKP is carried out based on the level of importance of each element, which is as follows:
   a. 10% Policy
   b. 15 % Planning
   c. 17 % Organization and personnel
   d. 35 % Implementation
   e. 15 % Monitoring, evaluation and follow-up
   f. 3% Documentation
   g. 5% Management review and performance improvement
2. The weighting of the SMKP implementation assessment for each sub-element in the SMKP is carried out based on the number of criteria for each sub-element. The same weighting is carried out for each criterion in each sub-element based on the audit checklist
3. Assessment sample of the application of SMKP in the implementation of both internal and external audits are carried out by taking samples from each activity area, based on the professional judgment of each auditor.

4. Internal audits to assess the implementation of SMKP are carried out at least once a year according to existing requirements.
5. External audits of the implementation of SMKP Minerba are carried out in the event of accidents, dangerous incidents, incidents resulting from worker illnesses, work-related illnesses, disasters, and/for the purposes of assessing mining safety performance.
6. SMKP Minerba audit standards and procedures are in accordance with the decree of the Minister of Energy and Mineral Resources number 1827.K/30/MEM/2018 concerning guidelines for implementing good mining engineering principles.
7. Categories of audit findings are as follows:
   a. The critical category is a finding that results in death (fatality)
   b. Major Category
      1) In the element inspection results, sub-elements were found whose value was less than 50% and
      2) There are minor findings for one sub-element audit of more than 30% of locations.
   c. The minor category is non-compliance with the provisions of the Constitution, standards, guidelines and other references.
8. Reporting the results of the internal audit of SMKP implementation no later than 30 days after the fourth quarter. and carrying out an external audit no later than 14 working days after the audit is carried out

2.4 SMKP Implementation Assessment

The assessment of the implementation of SMKP uses assessment criteria that have been determined in the Decree of the General of Minerals and Coal 185.K/37.04/DJB/ 2019. where one example of the criteria is as follows:

1. Score 0: there is no evidence to show that the holder of IUP, IUPK, IUP operations, IPR, IUJP, has prepared the policy.
2. Score 1: there is evidence that an initial review of mining safety conditions has been carried out, but it has not been fully complied with.
3. Score 2: there is evidence showing that an initial review has been carried out but has not involved all departments and workers in its preparation.
4. Score 3: there is evidence showing evidence of an initial review of mining safety conditions, and has involved all departments, workers, but has not carried out an evaluation.
5. Score 4: there is evidence showing evidence of an initial review of mining safety conditions, and has involved all departments, workers, and has carried out an evaluation.Nilai 0: tidak ada bukti menununjukkan pemegang IUP, IUPK, IUP operasi, IPR, IUJP, telah melakukan penyususnan kebijakan.

For more detailed standards and procedures for assessment criteria for the implementation of mining safety management systems, see the decision of the Minister of Energy and Mineral Resources number 185.K/37.04/DJB/ 2019 concerning technical instructions for implementing mining safety and implementing, assessing and reporting mining safety management systems. minerals and coal.

3. RESEARCH METHODOLOGY

3.1 Research Method

The type of research used is a comparative qualitative method. This research refers to the results of field observations and existing data on the company based on the results of the internal audit of the SMKP Minerba based on the Director General of Mineral and Coal No. 185.K/37.04/DJB/2019.

3.2 Period and Location of the Research

This research was conducted on 27th of February s.d. 6th of April 2023 at PT Putra Muba Coal.

3.3. Procedure

The research stages carried out are:

1. Literature study
   Literature study is an activity to search for relevant information and theories related to SMKP Audit activities based on references from books, journals and other references.
2. Field observation
   Observasi lapangan dilakukan dengan mengamati Field observations are carried out by observing real conditions in the field, then looking for as complete data as possible that is in accordance with the problem formulation and research objectives that are needed directly for further processing.

3.4. Data Collection

The data collection techniques in this final research assignment are:

1. Primary data
   Primary data is data obtained directly from research results in the field. The primary data is audit working day data, audit plan data and internal audit result data
2. Secondary Data
   Secondary data is data obtained from library sources related to research including regional achievement locations, labor statistics, organizational structure, company SMKP documents, related SOP documents and Director General's Decree No.185.K/37.04/DJB/2019.

4. FINDINGS AND DISCUSSION

4.1 Assessment Results of the Implementation of 7 Elements of SMKP Minerba at PT Putra Muba Coal

In the SMKP Minerba assessment, there are several elements that must be assessed. This assessment must be completed by an auditor. However, before carrying out this assessment, an auditor must have an audit work plan and work day plan.

Based on the results of the SMKP audit assessment at PT Putra Muba Coal where the audit assessment results obtained the percentage value of the elements which, if added up, obtained a percentage of 27% of the total weight value of 100% based on the audit criteria. The value achieved by PT Putra Muba Coal is stated in the poor category, and improvement is needed in the form of improvements as well as setting a target to increase the value of the audit results for the following year in a measurable and gradual manner so that the increase in the value of the audit results can be achieved

in the following year so that the increase target can be achieved well. where the achievement level value of this percentage is assessed based on the technical guidelines for SMKP Minerba Kepdirjen No.185.K/37.04/DJB/2019. For more details, see Table 4.1

Table 1 Table of audit results of the implementation of mineral and coal SMKP at PT Putra Muba Coal

Number	SMKP Elements	Element value	Percentage of element value
1	Policy	10 %	3 %
2	Planning	15 %	4 %
3	Organization and personnel	17 %	10 %
4	Implementation	35 %	8 %
5	Monitoring, evaluation and follow-up	15 %	2 %
6	Documentation	3 %	1 %
7	Management review and performance improvement	5 %	0 %
Sum		100 %	27 %

The audit results of the mineral and coal SMKP at PT Putra Muba Coal Perelemen, namely:

4.1.1 Element I Policy

Based on the audit results, the implementation of the SMKP element I policy received a score of 3% out of 10% assessment, for the total element score obtained was 6 elements from a maximum total of 19 points.

4.1.2 Element II Planning

Based on the audit results, the implementation of SMKP element II planning was 4% out of 15% assessment, the total element value obtained was 7 elements from a maximum total of 29 points.

4.1.3 Element III Organizationi and Personnel

Based on the audit results, the application of SMKP to element III of the organization and personnel received a value of 10% out of the total 17% assessment, for the total element value obtained was 37 elements from a maximum total of 64 points.

4.1.4 Element IV Implementation

Berdasarkan hasil audit, penerapan SMKP pada elemen IV Implementasi mendapatkan bobot nilai 18% dari total 35% bobot penilaiannya, untuk total nilai elemen yang diperoleh adalah 26 elemen dari dari total poin maksimal 64.

4.1.5 Elemen V Monitoring, Evaluation and Follow-up

Based on the audit results, the implementation of SMKP in element V monitoring, evaluation and follow-up was 12% out of the total 15% for the total element value obtained was 8 elements from a maximum total of 56 points.

4.1.6 Element VI Documentation

Based on the audit results, the application of SMKP to the VI Documentation element received a score of 1% out of the total 3% assessment, for the total element score obtained was 4 elements from a maximum total of 12 points..

4.1.7 Elemen VII Management Review and Performance Increase

Based on the audit results, the implementation of SMKP in element VII of management review and improvement was of 1% out of the total 5% assessment weight for the total element value obtained was 4 elements out of a maximum total of 13 points.

The calculation of the percentage of audit results for each element of the SMKP Minerba is as follows:

1. Element I Policy
   Known:
   Element value % = 10%
   Maximum element value = 19
   Total element value = 6
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{6}{19} \times 10\%$
   $= 3\%$
2. Elemen II Planning
   Known:
   Element value % = 15%
   Maximum element value = 29
   Total element value = 7
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{7}{29} \times 15\%$
   $= 4\%$
3. Elemen III Organization and personnel
   Known:
   Element value % = 17%
   Maximum element value = 64
   Total element value = 37
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{37}{64} \times 17\%$

= 4%

4. Elemen IV Implementation
   Known:
   Element value % = 35%
   Maximum element value = 120
   Total element value = 26
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{26}{120} \times 35\%$
   = 8%
5. Elemen V monitoring, evaluation and follow-up
   Known:
   Element value % = 15%
   Nilai elemen maksimal = 56
   Total nilai elemen = 8
   Persentase Nilai Elemen = $\frac{\text{Total nilai elemen}}{\text{total nilai elemen maksimal}} \times$ persentase nilai maksimal
   $= \frac{8}{56} \times 15\%$
   = 2%
6. Element VI Documentation
   Diketahui :
   Element value % = 3%
   Maximum element value = 12
   Total element value = 4
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{4}{12} \times 3\%$
   = 1%
7. Element VII Management Review and Performance Increase
   Diketahui :
   Element value % = 5%
   Maximum element value = 13
   Total element value = 0
   Percentage of element value = $\frac{\text{Total element value}}{\text{Maximum element value}} \times$ maximum value percentage
   $= \frac{0}{13} \times 5\%$
   = 0%

4.2 Results of Conformity and Non-Conformity in the Implementation of SMKP Minerba at PT Putra Muba Coal

Based on the results of the SMKP audit assessment at PT Putra Muba Coal, conformities and nonconformities were found in the elements of the mineral and coal

SMKP. Where for suitability, the value obtained is in accordance with the weight of the Mineral and Coal SMKP assessment of Director General No. 185.K/37.04/DJB/2019 and no major or minor nonconformities were found. For suitability, the 7 best audit results were obtained, where the assessment obtained a percentage value of 27% of the total weight value of 100%, while this result must be improved further so that it can reach 100%. For non-conformities, namely the findings in the audit results which are major and minor, the findings are 65 major findings and 23 minor findings. These findings will later be grouped and assessed for each element in the mineral and coal SMKP. Meanwhile, this nonconformity reached a percentage of 83% and this value is considered high. To achieve 100%, the company needs to make improvements by implementing all the conformity elements in accordance with the SMKP Minerba.

5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion

From the results of the processing and discussion of research results regarding the application of mineral and coal SMKP at PT Putra Muba Coal, the following conclusions were obtained::

1. Based on the results of the PT Putra Muba Coal SMKP audit evaluation, the audit implementation achievement value was 27%.
2. Based on the audit results, it was found that the application was in accordance with the 7 best audit findings and 88 points of nonconformity were found, namely 65 major findings and 23 minor findings respectively.

5.2 Recommendation

The suggestions are as follows:

1. Muba Coal needs to improve the elements that had been implemented well so that the implementation of the Minerba SMKP in the company could be even better.
2. PT Putra Muba Coal must set a target to increase the value of audit results for the following year in a measurable, gradual manner so that the increase in the value of audit results could be achieved in the following year and support is needed from all management so that the increase target can be achieved well.

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