Evaluate the Implementation of Occupational Health and Safety (OHS) Management System Performance Measurement at PT. XYZ Medan to minimize Extreme Risks

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Abstract

OHS is an activities to ensure and protect the safety and health of the workforce through prevention of occupational injuries and occupational diseases. One way of prevention of work accident is through to implement OHS System. The OHS process should begin with a good planning process to ensure that its implementation complies with the desired policies and objectives. PT. XYZ Medan has implemented OHS System which is regulated in the procedures and manuals of the company's management system. The purpose of this study was to assess and evaluate the Occupational Safety and Health Management System and also to evaluate Hazard Identification in the company. This research uses checklist method of all assessment criteria of OHS management system based on Indonesian Government Regulation, and for application of OHS in company use qualitative data through spreading of quisioner to managers, supervisors and workers. Based on the result of observation, it is found that the implementation of OHS in the company is not fully complied with the Indonesian Government Regulation. There are still 24 unfulfilled criteria that is concerning policy, plan of OHS, document control, product control, work security, hazard inspection, material management, skills and abilities. This study resulted in the acquisition of the results of analysis in the achievement level of OHS is 92.2% and has been included in the satisfactory category so worthy to be certified and ranked the golden flag. And analysis of the implementation and implementation of OHS to the established principles has been above 50% and can be interpreted that OHS is considered important to be applied in the company.

1. Introduction

Occupational Health and Safety Management System is a process of OHS Management integrated into a complete management system starting from the stages of planning, implementation, measurement and supervision. However, in the internal audit process based on Indonesian Government Regulation which was held in July 2017 by the central auditor, there are still some deficiencies in the audit process, including related to policy, evaluation review, OHS strategy plan, OHS manual, OHS information, the latest OHS documents, goods and service verification systems, security risk control work, production facility scheduling, labor conditions recovery procedures, workplace inspections, hazardous materials control, internal audit scheduling and OHS training programs.

PT. XYZ Medan is one unit in charge of producing electrical energy. This company is also one of the places that have the potential for high occupational injury hazards so that there must be work accident control in the company by implementing the Occupational Safety and Health Management System.

2. Methods

The research method used is qualitative method and with Action Research approach, which is a method that solve an indication of condition, symptom on existing condition and is running with data collecting, tabulating and clarifying and interpreting to find root cause and evaluate gap of standard criteria and the applicable OHS. It ensure the 12 criteria contained Indonesian Government Regulation, such as:

The OHS program has been implemented or not, including the OHS manual (including OHS policy, organizational structure, OHS team structure, OHS goals and objectives, job descriptions) and hazard identification, risk assessment and control procedures (including hazard identification records);

Control of internal audit documents and procedures;
Emergency response procedures and management review meetings.
After that perform the assessment of checklist method by making the sign "√" in the choice of each criteria column in the OHS audit checklist. Then look for criterion scores for each element of the 12 OHS audit elements and score criteria of each principle of the 5 principles of OHS implementation summed up. Then look at the extent to which the application of OHS has been applied to be suspended.

The distribution of questionnaires was also conducted to see the implementation of OHS management system applicable in PT. XYZ Medan. Distribution of questionnaires given to managers, suppliers and staff workers.

2.1. Implementation of OHS
In preparing the OHS plan, the entrepreneur involves Occupational Safety Expert, Working Committee on Occupational Safety and Health, Workers' Representatives and other Related Parties. That's the obligation for every company to emphasize all employees especially for important positions such as supervisors, managers in each department need to understand Indonesian Government Regulation, because of the importance of the implementation of OHS then there are provisions of its implementation, some provisions of who must apply OHS:
1. Companies with workers / laborers shall be no less than a hundred persons
2. Companies that have a high level of potential danger / risk. (High definition of harm in accordance with the provisions of legislation).

The purpose of Internal Audit OHS is:
\[a.\] To ascertain whether the OHS management system that is run has met the established procedures and in accordance with the requirements and standards.
\[b.\] To find out whether the OHS management system has been running as it should be in the whole range according to the scope of its implementation.
\[c.\] Ensure that the OHS management system is effective in addressing all OHS issues within the organization to avoid misdirected, virtual, or random OHS [1].

2.2. Work Accident Risk Assessment
Risk assessment using qualitative methods, i.e. by using a risk matrix that describes the level of probability and severity of an event expressed in terms of ranges from the lowest risk to the highest risk.

2.3. Hazard Identification Techniques
If identification of potential hazards is identified, there will be two dominant causes:
1. Unsafe action (unsafe action) caused: fatigue due to lack of rest, work hours exceeds the provisions set in legislation, malnutrition is the imbalance between food intake compared with the labor needed in work, incompetent because not trained and work up late at night constantly.
2. Unsafe condition (unsafe condition) caused by extreme weather that is storm and hot rain, narrow working space without adequate fresh air, expired equipment that is still in use and insufficient lighting so that workers are forced to work dimly and result in eye damage.

An implementation method for controlling the risks derived from the results of a risk assessment undertaken to reduce or mitigate risks associated with a hazard. Control methods must follow the hierarchy or risk control level, as required by OHS legislation. It is important to ensure that any control methods do not pose new hazards, and the effectiveness of the controls should continue to be monitored.
### Table 1. Risk Probability Analysis

| Kriteria                  | Keterangan                                 | Nilai |
|---------------------------|--------------------------------------------|-------|
| Continue /Terus menerus   | Pemaparan terjadi beberapa kali dalam sehari | 10    |
| Frequent /Sering          | Pemaparan terjadi harian/minimal sekali dalam sehari | 8     |
| Occasional /Kadang 2      | Pemaparan terjadi sekali seminggu           | 5     |
| Infrequent /Tidak sering  | Pemaparan terjadi antara sekali seminggu sampai sekali dalam sebulan | 3     |
| Rare /Jarang              | Pemaparan terjadi beberapa kali dalam setahun | 2     |
| Very rare /Sangat jarang  | Pemaparan terjadi sekali dalam setahun      | 1     |
| No exposure /Tidak terpapar | Pemaparan tidak pernah terjadi              | 0.5   |

### Table 2. Hazard Frequencies

| Kriteria                        | Keterangan                          | Nilai |
|---------------------------------|-------------------------------------|-------|
| Catastrophe /Malapetaka         | Pemaparan terjadi beberapa kali dalam sehari | 10    |
| Disaster /Bencana               | Pemaparan terjadi harian/minimal sekali dalam sehari | 8     |
| Very serious /Sangat serius     | Pemaparan terjadi sekali seminggu   | 6     |
| Serious /Serius                 | Pemaparan terjadi antara sekali seminggu sampai sekali dalam sebulan | 4     |
| Casualty treatment / Perawatan medis | Pemaparan terjadi beberapa kali dalam setahun | 2     |
| First aid treatment/ P3K        | Pemaparan terjadi sekali dalam setahun | 1     |

### Table 3. Severity

| Kriteria                                      | Keterangan                                                                 | Nilai |
|-----------------------------------------------|---------------------------------------------------------------------------|-------|
| Almost certain / Hampir pasti                 | Sangat mungkin akan terjadi/hampir dipastikan akan terjadi pada semua kesempatan (1:10) | 10    |
| Quite possible / Mungkin terjadi             | Mungkin akan terjadi atau bukan sesuatu hal yang aneh untuk terjadi (1:10 – 1:100) | 8     |
| Unusual but possible /tidak biasa namun bisa | Biasanya tidak terjadi namun masih ada kemungkinan untuk dapat terjadi tiap saat (1:100 – 1:1000) | 5     |
| Remotely possible /Kecil kemungkinannya       | Kecil kemungkinannya untuk terjadi/sesuatu yang kebetulan terjadi (1:1000 – 1:10000) | 3     |
| Conceivable / Sangat kecil kemungkinannya     | Belum pernah terjadi sebelumnya setelah bertahun-tahun terpapar bahaya/kecil sekali untuk terjadi (1:10000 – 1:1000000) | 2     |
| Practically impossible /Secara praktek tidak mungkin terjadi | Belum pernah terjadi sebelumnya dimanapun / merupakan sesuatu yang tidak mungkin untuk terjadi (1:1000000 – 1:10000000) atau lebih rendah | 1     |
2.4. **The Hierarchy of Risk Control**

The elements of production include:

a. Man himself  
b. Equipment that is not good but still used,  
c. Materials containing various hazards according to their properties and characteristics.  
d. Processes in the production of which may present hazards such as blasting or fires

Here the Hierarchy of risk control:

![Hierarchy of Risk Control](image)

**Figure 1. Hierarchy of Risk Control**

**Note:**

1. Elimination, completely eliminates the source of potential hazards  
2. Substitution, replacing a material equipment with a lower potential hazard such as equipment or chemicals  
3. Control Engineering, for example by adding guarding or cover or isolation, i.e separating for example with distance or closed.  
4. Administrative Controls, such as supervision, training, rotation, provision of procedures.  
5. Use of Personal Protective Equipment (PPE), such as ear protection, mask, etc
3. Results and Analysis

The method used in this research is qualitative method. The process of data analysis is started by reviewing all data that is from check list. Check list method is done referring to the Guidance of Vocational Appraisal Achievement Indonesian Government Regulation.

Some of them are found to be mismatches and among those nonconformities will be evaluated based on compliance that must be completed to cover and complement the company’s internal audit data.

3.1. Calculation of OHS Fulfillment Level Comply Data:

\[
\text{Comply Data} = \frac{\sum \text{Conformity Score}}{166 \text{ Criteria}} \times 100\% \quad \text{(1)}
\]

\[
= \frac{142}{166} \times 100\% = 85.54\%
\]

Uncomply Data: 14.46%

![Figure 2. Internal Audit Findings](image)

![Figure 3. Chart Internal Audit Findings](image)
Table 4. Scores to Each Criteria of OHS

| Kriteria | Unsur SMK3 |
|----------|------------|
|          | Sesuai | Tidak Sesuai | % Sesuai | % tdk sesuai | Total |
| Unsur 1  | pembangunan dan pemeliharaan komitmen | 21 | 5 | 76,9 | 23 | 26 |
| Unsur 2  | strategi pendokumentasian | 11 | 3 | 78,6 | 21,4 | 14 |
| Unsur 3  | peninjauan ulang desain dan kontrak | 8 | 0 | 100 | 0 | 8 |
| Unsur 4  | pengendalian dokumen | 6 | 1 | 85,7 | 14,3 | 7 |
| Unsur 5  | Pembelian | 8 | 1 | 88,9 | 11,1 | 9 |
| Unsur 6  | keamanan bekerja berdasarkan SMK3 | 36 | 5 | 87,8 | 12,2 | 41 |
| Unsur 7  | standar pemantauan | 13 | 4 | 76,5 | 23,5 | 17 |
| Unsur 8  | penanggulangan perbaikan kekurangan | 9 | 0 | 100 | 0 | 9 |
| Unsur 9  | pengelolaan material dan pemindahan | 9 | 3 | 83,3 | 16,7 | 12 |
| Unsur 10 | pengumpulan dan penggunaan data | 6 | 0 | 100 | 0 | 6 |
| Unsur 11 | audit SMK3 | 3 | 0 | 100 | 0 | 3 |
| Unsur 12 | pengembangan keterampilan dan kemampuan | 12 | 2 | 85,7 | 14,3 | 14 |
| TOTAL:   |         | 142 | 24 | 166 |

3.2 Calculation of Achievement Level of OHS Improvement

From the results of check list, calculated the level based on its level. Here's the calculation:
A. Initial Level: 64 Criteria
   Total Appropriate: 57 Criteria
   Inappropriate Total: 7 Criteria
   Achievement Level: 89.06%
   Total Non-Compliant: 10.9%
   Level of Application: Satisfactory
B. Transition Level: 122 Criteria  
Total Appropriate: 112 Criteria  
Inappropriate Total: 10 Criteria  
Achievement Level: 91.8%  
Total Non-Compliant: 8.2%  
Level of Application: Satisfactory

![Transition Level](image1)

Figure 5. Transition Level

C. Advance Level: 166 Criteria  
Total Appropriate: 159 Criteria  
Inappropriate Total: 7 Criteria  
Achievement Level: 95.78%  
Total Non-Compliant: 4.22%  
Level of Application: Satisfactory

![Advance Level](image2)

Figure 6. Advance Level
D. Average of Achievement Level

\[
\text{Achievement Level} = \frac{89.06 + 91.8 + 95.78}{3} = 92.2\%
\]

\[
\text{Total Non Compliant} = \frac{10.9 + 8.2 + 4.22}{3} = 7.78\%
\]

Level of Application Satisfactory

**Figure 7. Averages Level**

3.3 *Evaluation of Hazard Identification Company*

The results of the audit evaluation, there is the 7th Criterion, element 7.1.5 which From states the recommendation of corrective action is still within the minor category. Therefore, improvement of the evaluation of potential hazards is necessary.

Following evaluation of Hazard Identification company:

a. Evaluation on the *Gardu Induk* Department

1. ID : IB-GI-01
   Activity: Monitoring
   Hazard : Working Failure PMT 150 kV or 20 kV
   Risks : Electrical outages extend
   Opportunities : 5 (Un-usual but Possible)
   Frequency : 2 (Rare)
   Result : 8 (Disaster)
   Risk Value : 80 (High risk)
   Control performed: Administrative

   Controls, such as: supervision, undertaking Routine Schedule Annual maintenance of line bay Power transformer and cubicle 20 kV, annual test control and protection test. Perform substitution control, if there are fatal disturbances such as: broken wire, insulator / inhibitor flash-over voltage penetrating due to lightning. And the Isolator should be replaced immediately.

2. ID : IB-GI-03
   Activity : Maintenance of Gardu Induk when it offs
   Hazard : Wrong Climbing
   Risks : Exposure / direct contact
with electric current
Opportunities : 8 (quiet possible)
Frequency : 5 (Occasionally)
Result : 4 (Serious)
Risk Value : 160 (High Risk)
Control performed : Control engineering, such as: provide marks, procedures
briefings before doing work

3. ID : IB-GI-43
Activity : PMT 20% contact prisoner
test
Hazard : Strain 20 kV
Risks : Exposure to voltage
Opportunities : 8 (quiet possible)
Frequency : 1 (Continuous)
Result : 10 (Catastrophe)
Risk Value : 80 (High risk)
Control performed:
administrative controls, such as providing SOPs Complementing PPE, such as voltage resistant
shoes, voltage resistant gloves.

b. Evaluation on the Warehouse is declared safe in the sense that there is no risk of hazards.
c. Evaluation on the Office is declared safe in the sense that there is no risk of danger.

3.4 Analysis Implementation of OHS in the Company
a. HSE Policy Establishment
From the results obtained 76% say YES, then the determination of the Policy in the
company is very important to do against the determination of OH & S policy.

b. Planning to Fulfill OHS Policies
From the results obtained as much as 78% say YES, then planning and fulfillment of
OHS in the company is very important to do.

Figure 8. Establishing OHS Policy
c. Implementation of OH & S Policy
   From the results of the questionnaire obtained as much as 72% say YES, then the application of K3 in the company is very important to do.

Figure 9. Planning of Fulfillment

Figure 10. Implementation of OHS policy

d. OHS Performance Measurements
   From the results of the questionnaire obtained as much as 77% say YES, then the implementation of OHS in the company is very important to do.

Figure 11. OHS performance measurement
4. Discussion and Conclusions

Based on Indonesian Government Regulation, PT. XYZ Medan has shown the percentage of total implementation of OHS to 86% so that the results of internal audit company has shown a very satisfactory value.

Audit results of related company management system as many as 24 elements. And has been explained in the discussion of evaluation of audit results.

The results of the average OHS application in the company are in the satisfactory category reaching 92.2%. And based on the results of questionnaires that have been distributed to respondents for each principle of OHS application in the company, obtained the acquisition value of YES which means very important to be applied in the company.

5. References

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