

Audit of Nickel Ore Mining Production

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Abstract—The purpose of this study is to find out how the production management is carried out, especially in mining, which is heavily influenced by tight work schedules, required size specifications, stock pile deposits and ship loading on time. Operational audit is part of an internal audit activity that focuses on the efficiency and effectiveness of the procedures and policies of an entity. Recommendations from operational audit reports must be followed up to enable the company to survive and be sustained in production. The research method used is qualitative analysis method with case study that aims to obtain a direct description of the object of research on production operations. The audit findings are 75 problems with 6 focus areas in heavy equipment, diesel fuel, human resources, barge and tugboat, load activity and site financial management. The overall management of production operations is inefficient and ineffective.

Keywords—operational audit; management control; efficiency and effectiveness

I. INTRODUCTION

The increasing needs of the world for manufacturing and the rapid industrial use of metal as its base material and the necessities of life made of gold, copper, lead, iron, steel and other minerals into mining opportunities. The Integra business group is a mining company operating in Indonesia, which explores mineral deposits in Indonesia. From the temporarily owned lands in the mine are in Sulawesi have produced gold, chromite, galena, sphalerite, copper and nickel. Integra was established in early 2005 and has exported its products mainly to China and some countries in Asia.

One of Integra's mining areas is in Central Sulawesi, Kolonodale and Towi which have obtained production business licenses. From nickel ore shipment there is often a delay in loading to the mother vessel so that it is subject to a demourage penalty of US\$ 20,000 per day and the waiting sometimes take a month to load. Of course this has an impact on a very high operating costs. Based on these phenomena then the fundamental question is what happens with the production so that there is such slowness. Has the site manager done its job well? Is the management control of the production function has been effective and efficient? What factors are causing production slowness?

Research on present situation and problems for investment in southeast Asia nickel mining done by Huo Xiaoping. Laterite nickel ore in Southeast Asia is a hotspot of Chinese mining investment. Concerning the overseas mining

investment, it is crucial to analyze the present situation and problems which guide to control the investment risks. Based on typical cases, the current situation, environment and driving force of investment in Southeast Asia laterite-nickel mining are analyzed, and four problems concerning this industry are extracted from internal and external aspects. As for these four problems, suggestions are given to government and enterprises for more benefits [1].

Jans, Alles and Vasarhelyi in their research on Process mining by extracting knowledge from the event logs maintained by a company's ERP system. The objective of their research is to make the case for why internal and external auditors should leverage the capabilities process mining offers to rethink how auditing is carried out. We do so by identifying the sources of value added of process mining when applied to auditing, which are as follows: 1. process mining analyzes the entire population of data and not just a sample; 2. critically that data consists of meta-data—data entered independently of the actions of auditee—and not just data entered by the auditee; 3. process mining allows the auditor to have a more effective way of implementing the audit risk model by providing effective ways of conducting the required walkthroughs of processes and conducting analytic procedures; 4. process mining allows the auditor to conduct analyses not possible with existing audit tools, such as discovering the ways in which business processes are actually being carried out in practice, and to identify social relationships between individuals. It is our argument that these sources of value have not been fully understood in the process mining literature, which has focused on developing it as a statistical methodology rather than on applying it to audit practice. Only when auditors and audit researchers appreciate what is new and unique about process mining will its acceptance in auditing practice become feasible [2].

Deo and Strong built a model in their research, an operation is considered as a basic unit of a production system. In each operation, resources are used or consumed that cause costs to a production system. Resources employed in each production operation are classified into eight resource categories of: machinery, fixture, operator, space, contracts, incentives, materials, and resources tied up in inventories. Each type of input engaged in an operation contributes its share of cost to the material undergoing an operation on the basis of time of its use or its quantity of consumption. The model also include the cost of material lost in the form of

waste or scrap, and cost of material waiting in the buffers and in 'Work- in-process' area [3].

Historically, the audit has always been associated with the financial statements. The word audit itself comes from the Latin "audire" which means to hear. Audit in the Bahasa Indonesia is often interpreted as accounting audits, which is popular in the community as an examination of the financial statements. However, in practice, the term audit is no longer just a means for accounting audits, but rather to the examination process which ultimately aims to provide assurance (assurance) for the parties concerned. Some opinions about the definition of audit, among others:

Hayes et al define an audit is a systematic process of objectively obtaining and evaluating evidence regarding assertions about economic actions and events to ascertain the degree of correspondence between these assertions and established criteria, and communicating the results to interested users [4].

A. A. Arens et al, auditing is the accumulation and evaluation of evidence about information to determine and report on the degree of correspondence between the information and established criteria. Auditing should be done by a competent, independent person [5].

William F. Messier, Jr. et al, auditing is a systematic process of objectively obtaining and evaluating evidence regarding assertions about economic actions and events to ascertain the degree of correspondence between those assertions and established criteria and communicating the results to interested users [6]. In other words auditing is an examination conducted to critically and systematically, by an independent party, to the financial statements which have been prepared by management, along with the copy of records and supporting evidence, in order to be able to express an opinion on the fairness of the financial statements.

By definitions mention above, it can be concluded as follows:

- The concerns of the auditing process which is conducted by independent parties in gathering and evaluating evidence to assure the fairness of the statements made.
- The audit activities carried out through a process of mutual communication between the auditor and the auditee in order to gather the relevant data to be processed into significant information. Audits carried out methodically follow the rules of management through the process of planning, coordination, implementation, and control in order to run effectively and efficiently.
- In the process of the audit, the auditor should pursue every effort with a variety of approaches to collecting data and facts from the events that are relevant then process the data that has been collected into information to be processed into the auditor's conclusion that will be included in the audit report. The audit process is not restricted to the collection of data and information and outline the findings, but the

ultimate goal of an audit is the act of decision-making or corrective actions based on the information that has been processed and reported to the parties concerned.

Robert R. Moeller, the IIA defines the practice of internal auditing in this way [7]:

Internal auditing is an independent appraisal function established within an organization to examine and evaluate its activities as a service to the organization.

This statement becomes more meaningful when one focuses on its key terms. Auditing suggests a variety of ideas. It can be viewed very narrowly, such as the checking of arithmetical accuracy or physical existence of accounting records, or more broadly, as a thoughtful review and appraisal at the highest organizational level. The term internal defines work carried on within an enterprise, by its own employees, not by external auditors, outside public accountants or other parties, such as government regulators, who are not directly a part of the particular enterprise or enterprise.

According to Sawyer [8] : "Internal Audit is a systematic assessment and objective conducted by internal auditor on the operation and control of different function of the organization to determine whether (1) the financial information and operations have been accurate and reliable (2) the risks facing the company has been identified and minimized (3) external regulations, internal policies and procedures that can be accepted has been complied (4) the criteria for satisfactory operation have been met (5) resources have been used efficiently and economically, and (6) the organization's objectives have been achieved effectively. All done with a purpose to consult with management and help members of the organization in carrying out its responsibilities effectively "

Internal audit according to Alvin A. Arens et al [5]: "An operational audit is a review of any part of an organization's operating procedures and methods "

Internal control is defined as [9] : "A process - which is run by a board of directors, management and other personnel entities - that are designed to provide reasonable assurance about the achievement of the three factions of the following purposes: (1) the reliability of financial reporting, (2) the effectiveness and efficiency of operations, and (3) compliance with laws and regulations ". Based on purposiveness divides the internal control into two types:

- Internal accounting control, is part of the internal control system, including organizational structure, methods, and size - the size of which is coordinated primarily to keep the wealth of the organization and check the accuracy and reliability of accounting data. Internal accounting controls that will ensure the safety of both the investors and creditors of wealth invested in the company and will produce reliable financial statements.
- Internal administrative control, includes organizational structure, methods, and measures that are coordinated primarily to promote efficiency and compliance with management policies.

Alvin A. Arens et al describes internal control as follows [5]:

“A system of internal control consists of policies and procedures designed to provide management with reasonable assurance that the company achieves its objectives and goals. These policies and procedures are often called control, and collectively they comprise the entity’s internal control.”

From the definitions above, it can be concluded that internal control is a process which is done by the management of a company in order to provide reasonable assurance in achieving objectives. Good internal control in a company can assist management in providing the required information, overseeing the company’s operations, as well as reduce the likelihood of various levels of embezzlement and fraud.

II. METHOD

The research was conducted at PT Integra Technology Nusantara which is part of Integra group with main function of doing nickel mine that is from extraction until loading to ship. The scope of the study is to assess whether nickel mine production specifically under the OBC (operational business control) headquarters manager has operated economically, effectively and efficiently.

In internal audit, we need a basic framework that is accompanied by a detailed program in order to provide the groundwork for operational inspection. Stages in the internal audit are:

- Preliminary Survey, intend to get an idea of the company's business by Q & A with management and staff as well as the use of questionnaires.
- Review and Testing of Internal Control System, to evaluate and test the effectiveness of management control contained in the company. Internal control is typically used questionnaires (ICQ), flow charts and narrative explanations and performed testing for some transactions (walk through the documents).
- Detailed Examination, conducting an examination of the company's transactions to determine whether the process in accordance with the established policy management. In this case the auditor should observe the activities of the functions in the company.
- Development Report, In preparing the inspection report, the auditors did not give an opinion on the fairness of the financial statements of the company. The report was made similar to the management letter, because it contains the audit findings regarding the irregularities that occurred against criteria (standard) that lead to inefficiencies, ineffectiveness and weaknesses in management control systems of the company. In addition, the auditor also gives suggestions for improvement.

III. RESULTS AND DISCUSSION

The data is a crucial element that serves as the basis for objective decision-making processes to solve a problem.

Therefore, in a study is absolutely necessary for the reliable data is correct, timely, and covers a broad scope so to provide an overview of the overall problem.

Regarding the collection of data, researcher used field research method to obtain primary data that is relevant and necessary in this study, and perform the method of documentation for secondary data directly to related company, in the form of company's history, organizational structure, job description, and other data. Some of the techniques used in this method are:

A. Observation

Observation means paying attention, it can also be interpreted as an observation and recording carefully and systematically the phenomena being studied. Observation is useful to get the facts on the ground. In this study the researcher use the method of observation without participation, where the author is outside (not a participant) in making observations.

B. Questionnaire

The questionnaire is a technique of data collection is done by providing a list of written questions to employees in related fields in order to obtain data related to the research problem. The questionnaire also aimed to prove or corroborate the results of observations by the author. The use of the questionnaire has a weakness, that is the question and the answer is bound so there is likely important information can not be obtained. However, the advantages of the questionnaire is that the answers obtained become more apparent and easily classified.

C. Interview

The interview is a data collection techniques to obtain information by way of question and answer orally. In this study, the form of the interview was used structured interviews, in which interviews were conducted by using a list of questions that have been formulated in advance.

D. Documentation

An effort to obtain information by collecting written data or documents of the company.

In analyzing the data, the researcher uses qualitative data analysis techniques, namely by identifying and analyzing various data obtained through research on the function of smelter of the company. Data analysis techniques that researchers use as follows:

- In a preliminary survey, researchers will conduct physical examination at a glance to get a picture of the implementation of the company's production function as well as an indication of the problems may exist. Then researcher tries to find out and understand more about the company by way of collecting facts that are potentially at the beginning to be explored in the form of written data or documents. The types of documents are the history and company profile, organizational structure, job descriptions and responsibilities, policies

and procedures of accounting functions, as well as forms and other data about the company activities.

- At this stage of the review and testing of internal control systems, researcher will distribute internal control questionnaires to key management of the production function. The questionnaire is then analyzed to obtain provisional conclusions regarding the internal control management.
- At the stage of in-depth examination, the data that has been given priority to the researchers will chose data that most influence in the course of the production function. The researcher also will conduct interviews with the part related to mine production, test the obedience of performing the functions of production management with established procedures and rules applicable to the conduct walkthrough on some documents.
- In the last stage, the researchers report the results of the examination to be submitted to the management. The contents of this report includes the findings of irregularities that occur, the effects of such deviations, as well as recommendations for improvement.

After doing the above steps, the researcher will assess the findings to conclude whether the production function in the company has been run effectively and efficiently. Based on these results, the researcher will analyze the factors that may lead production function is ineffective and inefficient, and the problems that can arise from them.

A. Preliminary Survey Phase

The focus of the audit area includes high-risk functions:(1) Operational activities with material costs, i.e. heavy equipment, diesel, working, barge and tugboat, loading activity.(2) Financial management activities and controls related to the operational management of head office projects.

At this stage the researcher interviews with the central financial manager in Jakarta who briefly obtained answers about the costs incurred, generally the site manager will authorize the submission of monthly budget for production. Budget control at headquarters is difficult because the previous budget has not been completed accountable for new submissions. So there are suppliers who are paid twice for the same order without realizing it. The results of short interviews with OBC managers and site managers can be concluded that the organization's functions are not well coordinated resulting in insufficient production time and the quality is also low. Finally shipment is very late and done in a hurry because it has demurrage with a fine of \$ 20000 per day and sometimes until one month. Then followed by observation by observing directly the activities undertaken in the mining area. Beginning with geologists working to get an area or area suspected of containing nickel seeds until production activity.

Then made memoranda survey as a temporary allegation of audit findings that will be done deepening in the next step are:

- The occurrence of a demurrage resulting in the company having to pay a considerable penalty.
- The quality of iron ore content ready in the stock pile under the existing 1.2% contract terms is 1.8%.
- Workers are not supervised and well guided so that work without any direction of purpose.
- 4. The diesel storage tank is not maintained and maintained so that the remaining diesel fuel in the tank is only approximate, not in check periodically.
- 5. Heavy equipment operator when not working will have a break with the machine keep working so the room becomes cold continuously with AC on.

Testing of management control system. At this stage the researcher distributes the questionnaire to the key employees of the production function i.e. the site manager and the supervisors who are considered to know and understand the management of good production operations. The results of management control testing show that the coordination between parts is not going well.

The In-depth Audit. Based on a survey memoranda researcher has obtained then prepared an audit plan for functional areas to be audited and also to determine the checkpoints as follows:

- Rental of heavy equipment: based on vendor determination, agreement, lease and ownership fee.
- Helper: Periodic report, request submission, performance, cost.
- Barge and tugboat: vendor determination, agreement, ownership, rental fee.
- Solar: periodic inventory report, usage report.
- Overtime: overtime warrant.
- Demurrage costs: causes and preventive and corrective actions.

Once the researcher conducted an audit program based on above circumstances and accompanied by observing, asking questions, analyze, verify, investigate and evaluate the researcher summarize the findings obtained.

The main problem that occurs in general, namely:

- There is no SOP or a clear policy.
- Unclear contract with a third party and the authorization.
- There is no mechanism to check / monitoring.
- No clear coordination in the organizational structure and job description.
- Lack of control and review.
- Negligence, not discipline.
- Lack of coordination between the department.

Internal audit recommends the following:

- Need clear SOP or policies relating to the assets and the company's costs.
- Clear segregation of duties regarding the authorization.
- Clear coordination policies and job description written by function or department and maximize tiered monitoring function.
- Dealing with third party and the procurement of goods and services should be clearly stated in the contract and performed by a particular section (established procurement section), and notified to the interested parties.
- Maximizing the control function and review on employees.
- Necessary guidance or punishment against personnel who have a track record of indiscipline.
- Optimizing the supervision and coordination of all personnel and the intersection.

B. Reporting Phase.

After conducting the preliminary survey stage to in-depth examination on the activities of the production area PT Integra Technology Nusantara then researcher prepare the final report in audit report standard form. The main report should states the opinion which is inefficient and ineffective and also based on audit findings suggest recommendations for improvement.

IV. CONCLUSION

Based on the result of production process research, it is concluded that the production activity of PT Integra Technology Nusantara operates ineffective and inefficient.

There were 75 findings from 6 focus areas that are 14 findings on heavy equipment management, 11 findings on diesel fuel management, 27 findings on human resources management, 5 findings on barge and tugboat management, 7 findings on loading activity management and 11 management findings Finance.

The recommendation is that there should be a SOP or policy on the company's assets and financing, authorization and limitation arrangements for personnel and departments, clear coordination policy and written job per function and tiered monitoring, any cooperation with third parties is set forth in standard contracts, rewards And punishment, optimizing supervision and coordination between sections.

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