

## **EVALUATION OF OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEM (OHS-MS) IMPLEMENTATION IN MANUFACTURE INDUSTRY**

**Ariyanto Nugroho<sup>1\*</sup>, Azir Alfanan<sup>2</sup>**

<sup>1,2</sup>Universitas Respati Yogyakarta

**\*corresponding author: ariyanto.nugroho1@gmail.com**

### **Abstract**

Implementation of OHS-MS is one way to reduce occupational diseases, occupational-related disease and accidents also. There are so many benefits while OHS-MS being goog applied by the industry such as reduce losing work hours and increase productivity. In Indonesia OSH-MS being regulated by Government regulation number 50/2012 article number 5 and paragraph number 3, which is informed that every industrial activity which has one hundred employees or more, or there is a specific hazard with the high probability to support an accident such as explosive, pollution, fire and other accident, it have to conduct OHS-MS. Mega Andalan Kasalan (MAK) in one of big manufacture industry which has an operation at Sleman district. it has 720 employees so that way it has to conduct OHS-MS properly, OHS-MS implementation should be evaluated period, it will support to run a continues quality improvement on OHS-MS. The aim of this research is to run an evaluation of MAK OHS-MS implementation. The research will be running with qualitative, using questionnaires, checklist and also interview with the employee and person n charge with OHS-MS. They are 5 points that will be explored, they are 1. OHS-MS Policy, 2. OHS-MS Planning, 3. OHS-MS Implementation, 4. OHS-MS Monitoring an evaluation, 5. OHS-MS Improvement mechanism. Conclusion of the research are: 1) MAK safety Policy develop at 2016, the chairman and all worker has run it but not quite well yet, 2) MAK safety planning also develop at 2016, which there are consists of aim a safety target, priority, control hazard, resources, time frame, indicator, and reporting system. 3) A big part of MAS safety planning has run such as provide Safety human resources and all its equipment. 4) MAK also has running monitoring and evaluation using an external provider, but not all recommendations have done yet. 5) MAK will conduct an annual audit base on ISO 18000.

**Keywords: Occupational health safety, management, system**

### **1. INTRODUCTION**

The current era of globalization requires companies to compete to maintain their existence. Entrepreneurs are required to not only think about the results of their products but the company must also think about welfare, safety and occupational health (K3). Companies are required to pay more attention to K3 workers so that they are able to realize the company's goals. Prevention and reduction of potential Occupational Accidents (KAK) and Occupational Diseases (PAK) as well as assist companies in handling them quickly and appropriately, it is necessary to have an Occupational Safety and Health Management System (SMK3) in the company. In addition to the workforce feeling safe and calm in doing their jobs, the company has also paid attention to K3 workers and provides guarantees in the event of PAK and KAK, indirectly employees will be motivated to carry out their work properly so that the products produced will be of high quality and employee productivity will also increase [1]. Work safety is inseparable from activities in the industry as a whole, so patterns that must be developed in the handling of occupational safety, as

well as procurement of potential hazard control, must follow a systematic approach that is by applying SMK3. Unsafe actions (unsafe actions) and unsafe conditions (unsafe conditions) are rooted deeper than visible or occurring accidents. Based on data from the International Labor Organization (ILO) in 2013, one worker in the world dies every 15 seconds due to work accidents and 160 workers experience work-related illnesses. The previous year (2012) the ILO recorded 2 million cases of occupational accidents and occupational illnesses (PAK) annually. Meanwhile, the results of the report on the implementation of occupational health in 26 provinces in Indonesia in 2013, the number of cases of general illness in workers there were around 2,998,766 cases, and the number of cases of illness related to work amounted to 428,844 cases [2].

Work accidents are undesirable events that occur while doing work. According to international data every 15 seconds, a worker can die as a result of an occupational accident or Occupational Disease (PAK). Every day, 6,300 people die from KAK or PAK and more than 2.3 million workers die each year. The work process must be stopped for a long period of time due to the incidents of the CAC. The number of CAC is quite high, namely up to 3.7 million events. Poor K3 knowledge can reduce 4% of gross domestic product annually so that people experience economic problems that make it difficult to get money for their daily needs. The International Labor Organization (ILO) aims to create awareness around the world of dimensions and consequences related to CAC, injury, illness and to place OHS for all workers on the international agenda to stimulate and support practical action at all levels [3].

Work accidents in Indonesia based on data from PT. Social Security is known that in 2011 there were 99,491 cases of work injuries. Whereas in 2012 the number of work accidents increased compared to 2011. The total number of work accidents in 2012 was 103,074 work accidents [4].

The highest number of cases of labor accidents in the Special Region of Yogyakarta (DIY) were experienced by predatory labor aged 26 to 30 years during the period of 2013 which reached 1,347 cases. The majority are caused by accidents at work locations where this condition is different compared to 2012 which is dominated by traffic accidents when traveling to and from work. Based on data from the Social Security Organizing Agency (BPJS) of DIY employment during 2013, there were 1,347 KAK cases. A total of 651 cases were accidents at the worksite, 460 cases were due to traffic accidents and 236 cases were caused by accidents outside the workplace, which were not due to traffic. Of the total companies that are required to provide BPJS in DIY, 3,464 companies have registered BPJS 1,377 companies. Whereas 2,000 more companies have not registered with BPJS because of most small and medium scale companies in DIY [5].

The application of SMK3 is one way to reduce the number of PAK, PAHK, and KAK. According to Sucipto (2014), the application of SMK3 has many benefits for the industry namely reducing work hours lost due to CAC, avoiding material losses due to CAC, creating an efficient and productive workplace because workers feel safe at work, improving the market image of the company, creating harmonious relationship for employees and the company [6]. SMK3 is regulated in Government Regulation No. 50 of 2012 Article 5 Paragraph 2 which states that every company that employs one hundred or more workers/laborers and/or contains high potential hazards resulting in work accidents such as blasting, fire, environmental pollution, and occupational diseases must implement the Safety and Health Management System Work (SMK3)

## **2. MATERIALS AND METHODS**

This research was conducted with a qualitative research method with a case study approach. Case study (case study) is a detailed qualitative research model about an individual or a particular social unit during a certain period of time [7]. Studies that explore a problem with detailed boundaries, have in-depth data retrieval and include various sources of information. This research is limited by time and place, and cases studied in the form of programs, events, activities, or individuals [8]. This type of research design, in qualitative research, is usually directly written in terms of qualitative research or sometimes included in the descriptive research category [8].

This research will be conducted for three months, namely from June to August 2017 at PT. Mega Andalan Kalasan Yogyakarta. Qualitative research does not use the term population, but Spradley [9] called "social situation" or social situations consisting of three elements namely: place (place), actors (actors), and activities (activities) that interact synergistically. In qualitative research does not use the population, because qualitative research departs from certain cases that exist in social situations and the results of the study will not be applied to the population.

The sampling technique of this study used purposive sampling of determining the source of data for the people to be interviewed selected with specific considerations and objectives. The results of research using qualitative methods only apply to cases of social situations. The results of the research can be transferred or applied to social situations (other places) if the other social situations have similarities or similarities with the social situations under study [9]. Informants in this study are:

- a. P2K3 Chairperson
- b. P2K3 Secretary
- c. Unit Coordinator

According to Lofland [10] the main data sources in qualitative research are words, and actions, the rest is additional data such as documents and others. In this regard, in this section, the types of data are divided into words and actions, written data sources, photographs and statistical data. Data sources for this research are 1). Primary Data; Primary data collection is data obtained directly from the results of in-depth interviews (in-depth interview) on the subject of research, namely 1 company leader at PT. Mega Andalan Kalasan as the informant as chairman of the company's P2K3 and K3 secretary/expert and 12 managers of each unit of the production section at PT. Mega Andalan Kalasan using the in-depth interview method. 2). Secondary Data; Secondary data is data obtained from the results of people, not directly obtained by researchers from research subjects. The secondary data meant here is in the form of written data sources about the company profile and the number of employees The instrument or research tool is the research itself. Collecting data using the interview documentation method, researchers need help with documentation tools so that the results of the interview can be recorded properly, and researchers have evidence of having interviewed informants or data sources. Aid tools used by researchers in data collection are notebooks, recording devices, and cameras [9]. According to [10] to determine the validity of the data required inspection techniques. The inspection technique is based on a number of specific criteria. There are four criteria used, namely the degree of trust (credibility) basically replaces the concept of internal viability from non-qualitative, transferability as an empirical problem depending on the similarity between the context of the sender and receiver, dependability is a substitute for the term reliability in non-qualitative research, Dana certainty (confirmability) that something is objective or not depends on the agreement of some people to the views, opinions, and findings of a person.

### **3. RESULTS AND DISCUSSIONS**

PT. Mega Andalan Kalasan is one of the industrial companies engaged in the field of the hospital equipment business. The company that was founded by Mr. Buntoro began in 1988. PT. Mega Andalan Kalasan was established from a household business in the Prambanan subdistrict of Bokoharjo Village which was a collaboration between the Academy of Industrial Mechanical Engineering (ATMI), which was initiated in 1977. In 1983 PT. Mega Andalan Kalasan has the name PT.MEGA Steel manufactures car bumpers with a rate of 2000 / year. Until 1986 the company experienced a very drastic decrease in demand as a result of the many car bodies that use the full press body system. In 1988 the company shifted production to the field of hospital equipment (Hospital Equipment) with the production of hospital beds, over bed tables, bedside cabinets, medicine cabinets, operating tables, and others. The company had obtained a national standard certificate in 1994.

At this time PT. MAK is a group company that joins MAK Group Indonesia and has 4 site plan. The factory one is PT. MAK, located in Tanjung Tirta Kalasan, Slemandan is a manufacturing plant for Hospital Equipment. Factories 2 and 3, namely PT. KIMAK and PT. MAMI who joined MAK Technopark, located on Prambanan Street, Piyungan KM 7 Sumberharjo, Prambanan, Sleman. PT. MAMI is a motorized manufacturer of MAK Technologies. Factory 4, namely PT. SPIKMA is located on Jalan Prambanan Piyungan KM 1 Bokoharjo, Prambanan, Sleman and functions as the manufacture of LPG gas cylinders. To strengthen the PT Quality Management System, MAK is trying to meet regulations. PT.MAK in 2001 succeeded in obtaining ISO9001: 1994 certification and subsequently in 2003 it received ISO 9001: 2000 regarding the quality management system. Then in 2008 PT. MAK sets ISO 14001 goals regarding environmental management systems and OHSAS 18001 regarding occupational safety and health management systems.

Ideology, Vision and Mission and the Creed of PT.MAK. PT.MAK's ideology "Becomes a pride for the Indonesian people". PT.MAK's Vision "To be the prime mover in a series of processes towards an industrial country in Indonesia". PT.MAK's mission 1) to become a center of excellence in the field of mechanical technology. 2) Building industrial-based industrial centers in the field of mechanical technology. 3) Gathering and utilizing various technological capabilities that are scattered in various parts of the country. 4) Build the image of an industry that prospers society. 5) Getting people to fall in love with MAK

PT.MAK's production location is located in 2 places namely PT. MAK in the village of Gendingan Tirtomartani, Kalasan (plate component unit plan, southern plan) and the second on the production floor of PT MAK Prambanan which is on the Prambanan Piyungan road (plan Prambanan MAK). Products produced by PT. MAK is carried out with a number of very accurate processes. The following are the steps in the process of making a product: a) Making design drawings: The production process carried out by PT.MAK is assessed from the design process of images of products that are produced primarily for products that have special specifications from the customer or customer. From this design, a component drawing or worksheet will be produced with the components inside and the tool needs. b)Punching; Punch is the process of making a component by punching or cutting in accordance with the mold that is on the punch machine made on the CNC milling machine. the material used in the punch process is a plate material that has gone through a cutting process.c) Cutting, Cutting is an initial process carried out on raw materials before going through the next process. Before cutting, raw materials must be in accordance with the desired size. Materials that go through the cutting process are plates and pipes. d) Turning process; Turning is a process that aims to eliminate the parts that are not needed. The removal

process includes: Reducing the diameter of the workpiece, Reducing the workpiece length, Making a thread and Separate the workpiece into two parts. e) Bending; Bending is the process of bending the material in accordance with the desired product shape. The machine used is a Plate Bending machine. g) Pressing; Pressing is the process of bending raw materials with the desired bending shape. h) Grinding process (deburring); Deburring process is carried out to smooth the sharp component parts/workpieces. The raw material that undergoes during is plate and pipe because the material passes through the cutting process. i) Drilling and hole saw; Drilling and hole sawing is almost the same process, namely making a hole in a component with a certain amount/diameter.

The difference between drilling and hole saw is that the drill is used to make holes in the middle pada pipe, while the hole saw is used to make a concave at the end of the pipe. J) Plastic injection; Plastic injection is the process of making components made of plastic by injecting plastic liquid into a mold. k) Welding; Welding is the process of joining two or more materials using welding if the welds are uneven the deburring process will be carried out. l) Polishing; Polishing is the process of cleaning components with stainless steel raw materials, raw materials will be polished to be shinier after welded. This process does not go through the painting process. m) Treatment; The treatment process is a process intended to prepare/control the solution used to immerse the materials or semi-finished materials before painting. This process is carried out to remove rust and oil from the raw material. The treatment process consists of several processes, namely: Pickling → rinsing I → surface → phosphating → rinsing II; 1) Pickling aim to remove rust from iron, 2) Rinsing I aims to rinse after the iron is inserted into the pickling tub. 3) Surface Conditional aims to neutralize the iron before it is inserted into the tub before. 4) Phosphating aims to remove oil and coat the surface of the iron so it does not rust easily before the painting process is carried out so that the paint can be more durable. 5) Rinsing II aims to rinse the iron clean.

Characteristics of Informants

Table 1. Characteristics of Informants

No	Informant	Age	Gender	Position / Professional
1	IK 1	58	Male	Corporate Legal / Secretary P2K3
2	IK 2	36	Female	HSE Staff
3	IT 1	42	Male	Regulatory Man 4 / Section Chief
4	IT 2	40	Male	Unit Chief
5	IT 3	44	Male	Section Chief
6	IT 4	31	Male	Operators

Key informants (IK) are superiors who formulate policies on SMK3. The relationship between key informant 1 (IK1) and key informant 2 (IK2) is a continuous structure, which is as a safety policymaker who will be disseminated to each unit and employee. There are two key informants in this research. Triangulation informants (IT) are employees in the unit that directly implement the policies that have been made. Triangulation informants (IT) in this study amounted to three people.

Determination of policies on the application of SMK3 can be done by conducting a preliminary review, namely by identifying hazards, identifying existing conditions, reviewing the cause and effect of hazard events and evaluating the efficiency and effectiveness of HR

Occupational Safety and Health Management System (SMK3) as contained in PP No.50 of 2012, is part of the overall management system which includes the organizational structure, planning, responsibilities, implementation, procedures, processes, and resources needed by the development, implementation and achieving, reviewing, and maintaining policies. In the context of controlling risks related to working activities in order to create a safe, effective, efficient and productive workplace. Not only the government but SMK3 is also the responsibility of the community, the market and the international world and the most important is companies and entrepreneurs who have started to preserve the application of SMK3 in companies, especially high risk companies with the aim of workers getting their rights so that they can fulfill their obligations and vice versa. Besides the application of SMK3 also has a good impact on the industrial world [6].

**1) Implementation of Safety Policy**

Determination of policies on the application of SMK3 includes the formulation of policies, the determination of policies, implementing provisions no: 2, namely the determination of policies, conducted a review, the level of leaders shows commitment and workers/workers have participated.

**a. Policymaking**

Determination of policies on the application of SMK3 can be done by conducting a preliminary review, namely by identifying hazards, identifying existing conditions, reviewing the cause and effect of hazard events and evaluating the efficiency and effectiveness of HR. The results of the study showed that in the company a preliminary review had been carried out in all units, but for the documented only in HE only because only OHSAS certified units. The consultation process has been carried out. K3 policy compilation in the company has been carried out consultation with workers and workers' representative's Consultation must be done because those who know better about the conditions on the ground are the lowest, namely the workers themselves. This is in accordance with PP No. 50 of 2012 article 7 paragraph 2 concerning the Establishment of K3 Policy. Policy formulation K3 through the initial condition of K3 and the process of consultation between the officers and representatives of workers/laborers.

**b. Determination of safety policy**

The results of the study show that the results of the K3 policy have been ratified by the top leadership of the company, the results of the policy determination have been disseminated to all workers/laborers, contractors, customers and suppliers through existing units in the company, the company has conducted a periodic review of SMK3 activities, every 6 once a month. In this study what has not been done by the company is well documented and maintained and is dynamic.

This is largely in accordance with the Guidelines for the Application Management System Occupational Health and Safety (SMK3) which states that Determination policy K3 must endorse the helm of the company, clearly stated goals and objectives K3, explained and disseminated to all workers / laborers, guests, contractors, suppliers and customers, and periodically reviewed to ensure that the policy is still in accordance with changes in the company.

**c. The Company Has Implemented the Nuance No: 2 (Establishment of Policy)**

The results showed that the company or management already had a K3 organization in the position of units. Companies or administrators provide a budget for the

K3 field in the amount according to need. The company/management determines personnel who have clear responsibilities, authorities, and obligations in handling OSH. Management or company has made coordinated planning related to K3, both annual meetings and coordination meetings with all units. The company has conducted an appraisal of performance related to K3, namely at the annual meeting presented by each unit. This is in accordance with the Guidelines for the Implementation of the Occupational Safety and Health Management System (SMK3) regarding OHS policy stipulation that: to implement number 2 letter c through letter g, employers and or management must place the K3 organization in a position that can determine company decisions, provide budget, quality workforce and other facilities needed in the field of OHS, assign personnel who have clear responsibilities, authority and obligations in handling OHS, make coordinated OHS planning, and conduct performance appraisal and follow up on implementation. K3.

d. Every level of leadership in a company must demonstrate a commitment to OSH

The results obtained that each level of leadership in the company has not fully demonstrated a commitment to OSH. This is adjusted to the Guidelines for the Implementation of the Occupational Safety and Health Management System (SMK3) regarding OHS policy stipulation which states that: Every level of leadership in a company must demonstrate a commitment to OHS so that SMK3 is successfully implemented and developed. At PT.MAK, it can be stated that it is not entirely appropriate because there are still many complaints from workers regarding superiors' commitment to the provision and determination of policies. In the interview results, it was stated that for the same unit with the same danger the same provisions were not determined, thus making workers not fully implement the existing provisions. In addition to providing PPE, it is still said to be standard, because according to the PPE employees needed, it must be the maximum because it is related to work safety.

e. Workers/workers have participated in K3

To implement OHS, every worker/laborer and other people in the workplace must participate in maintaining and controlling the implementation of OHS. The results obtained by each worker/laborer play a role in maintaining and controlling the implementation of K3 even though there are still workers who ignore OSH such as workers who do not use earplugs in noisy areas, there are workers in the welding section who often take off the welding goggles when doing welding. This is in accordance with the Guidelines for the Implementation of the Occupational Safety and Health Management System (SMK3) regarding the stipulation of OHS policies which state that every worker/laborer and other people who are at work must participate in maintaining and controlling the implementation of OHS.

## 2) **K3 Planning**

In OHS planning in one of the basic principles of OHS implementation, namely by preparing OHS plans based on the results of the initial review, identification of potential hazards, assessment and risk control, based on legislation and available resources. In the preparation, it must contain goals and objectives, priority scale, control efforts, determination of resources, implementation period, indicators of achievement and system of accountability. The K3 plan compiled by the company shall at least contain the objectives and targets, priority scale, hazard control efforts, determination of resources, implementation period, achievement indicators and accountability system. The results showed that the K3 plan compiled by the

company had contained goals and objectives that had been prepared from the start, hazard control efforts such as the existence of special team training, provision of adequate PPE, determination of resources carried out by each unit, a period of continuous implementation, indicators achievements made and reported by each raker. maintenance and care of PPE, and the system of accountability of workers' commitments in the use of PPE. This is in accordance with the Guidelines for the Application Management System Occupational Health and Safety (SMK3) about plans for K3 on Plans K3 which was developed by the company at least contains goals and objectives, priorities, efforts to control the hazards, resourcing, implementation period, indicators of achievement and the accountability system.

### **3) Implementation of K3 Plan**

The implementation of the K3 plan is the application of everything planned. In implementing the plan, several things need to be considered, namely whether the available resources, facilities, and infrastructure are sufficient to carry out the K3 plan.

#### **a. Entrepreneurs provide adequate resources**

Based on the results of the study note that the company or entrepreneur has provided adequate resources and facilities, but because of the rotation of the work of human resources that have been trained sometimes moved to another unit or section. Guidelines for Implementing an Occupational Safety and Health Management System (SMK3) regarding Implementation of OHS Plans: Implementation of OHS plans must be carried out by employers and/or management of companies or workplaces by 1) Providing qualified human resources. a) Procedure for Procurement of Human Resources. In providing human resources, the PRS must make effective procurement procedures, including (1) Procurement of human resources according to needs and having work competence and authority in the field of OSH as evidenced by (a) OSH certificate issued by the relevant agencies authorized; (b) work / operating permit and / or appointment letter from the competent authority. (2) Identification of work competencies required at each level of company management and organizing every training needed. (3) Making provisions to effectively communicate OHS information. (4) Making regulations to obtain the opinions and suggestions of experts. (5) Preparation for the implementation of the rules for the consultation and involvement of workers/laborers are active.

The observations and interviews of researchers if it is in accordance with the Guidelines for the Implementation of the Occupational Safety and Health Management System (SMK3) regarding the Implementation of OHS Plans, PT. MAK has not yet implemented the provision of adequate resources in accordance with the provisions namely Providing human resources who have the qualifications that have been determined by the SMK3 Implementation Guidelines.

#### **b. Entrepreneurs provide adequate facilities and infrastructure**

Based on the results of the study, it is known that the company or entrepreneur has not yet fully provided adequate K3 facilities and infrastructure. The available facilities and infrastructure are signs, lactation rooms using empty rooms, P3K already available, PPE is available, and in the event of a work accident, the company cooperates with the nearest hospital. According to the Guidelines for the Implementation of the Occupational Safety and Health Management System (SMK3) regarding the Implementation of OHS Plans: on Providing Adequate Infrastructure and Facilities include: a) Organizations/units



responsible for OHS fields, namely establishing P2K3 responsible for OHS, b) Budgets for sustainability organization, HR training, procurement of infrastructure and facilities, c) Operating / work procedures, information, and reporting and documentation. d) Work Procedures and Instructions. e) Efforts to Deal with Emergencies, Accidents and Industrial Disasters and f) Emergency Planning and Recovery.

Interviews and observations of company researchers have yet to implement a marsh emergencies, accidents, and industrial disasters and plans and emergency recovery. In the company environment, there is no polyclinic that is needed at any time if a work accident occurs. so far the company is limited to collaborating with the nearest hospital. The application of SMK3 in the company is in accordance with OHSAS 18001, but for the application of SMK3 based on PP No.50 of 2012, it can be declared unfeasible because clauses that have not been applied comprehensively and are not yet integrated. The results of the study also explained by the informant that in the units that have the same potential hazards the same policies have not been applied so that workers sometimes do not comply with the regulations set.

Application of Management System Occupational Health and Safety (SMK3) is one way to reduce the rate of Diseases Due to Work (PAK), Disease Due to Employment (Pahk) and Accident K Gov (KK). According to Sucipto (2014), the application of K3 SM has a lot of benefits for the industry namely reducing work hours lost due to work accidents, avoiding material and life losses due to work accidents, creating an efficient and productive workplace because workers feel safe at work, increasing *market image* of the company, creating harmonious relationships for employees and the company [6].

The results of this study support the research conducted by S. Embiring and Syahrizal (2014) entitled "Evaluation of the application of occupational safety and health management systems (SMK3) in building construction projects". The results showed the successful implementation of SMK3 for workers and for employees/staff in the Siloam Hospital building construction project by 91.81%. In accordance with the previous theory contained in the theoretical basis that the successful implementation of SMK3 in the workplace can be measured according to Permenaker No. 05, 1996, for the achievement rate of 85-100% given certificates and gold flags.

This study also supports research conducted by Pangkey and Walangitan (2012) entitled "The implementation of an occupational safety and health management system (SMK3) in construction projects in Indonesia". The results showed that SMK3 had an effect both for the company and the workforce itself. This can be seen from the data on occupational safety and health in October, November and December 2011, the number of workers affected by work accidents is still relatively low, so it does not cause significant disruption to development. In addition, there are no cases of work accidents or occupational diseases that cause death [11].

#### **4) OHS performance monitoring and valuation**

K3 performance monitoring and evaluation The method is carried out by the company for inspection, testing and measurement in accordance with applicable regulations and standards.

- a. The company has carried out checks, regulations, and measurements in accordance with applicable regulations and standard

The results of the study found that the company has carried out checks, tests and measurements in collaboration with the third party with an agenda of 1 year 2 times on the work environment and employee health and machinery in the company. This is in accordance with PP 50 of 2012 the company is in accordance with the fifth part of article 14 paragraph (3) in the case that the company does not have the resources to monitor and evaluate K3 performance as referred to in paragraph (2) may use the services of other parties.

b. Procedure inspection, testing, and measurement

(1) The personnel involved have sufficient experience and expertise

The results showed that the company had certified personnel with expertise from the hyperkes hall and PJK3 (occupational safety and health services company) to conduct testing at the company. This is in accordance with regulations Management System Safety and Health K Gov article 14 paragraph (2) monitoring and evaluating the performance of K3 as referred to in paragraph (1) through inspection, testing, measurement, and internal audit SMK3 conducted by human resources competent. And most companies are in accordance with applicable standards.

(2) Test records and measurements are well maintained and available to management, labor, and related work contractor

Based on the results of the study, it was found that the company had kept all data records from the results of measurements and tests with internal audits and stored in the HRD (*Human Resources Development*) and management had applied it to all employees in the company. Based on the occupational safety and health management system this is in accordance with the applicable SMK3 and meets the existing standards.

(3) Test equipment and methods have been guaranteed and have been met with K3 standards

The results of the research at the company explained from the informant that they had fully scattered to the testing officers who already had a certificate of competence appointed by PJK3 with the applicable K3 standard. According to the occupational safety and health management system (SMK3), this is in accordance with the regulations of the Occupational Safety and Health Management System.

(4) Corrective action has been taken immediately if there is found a non-compliance with the K3 requirements from the results of the inspection, testing, and measurement From the results of the study note that the corrective action in the company has been done immediately, management in the company and has made improvements if it found a mismatch with the OHS requirements of OHS investigations, OHS audits and an evaluation for management so as to ensure occupational safety and health. This is in accordance with the Occupational Safety and Health Management System article 15 paragraph (5) the results of monitoring and evaluation of OHS performance as referred to in paragraph (2) are used to carry out corrective actions. This study is in line with research by Mentang (2013) which states that the company has a system to measure, monitor and evaluate the performance of the Occupational Safety and Health Management System (SMK3) and the results are analyzed to determine the success or to identify corrective actions. Measurements and evaluations in question such as occupational safety and health inspection, OHS Management System Audit, corrective and preventive actions.

- (5) The investigation is sufficient to determine the cause of the problem from an incident. From the results of research in the company has conducted an adequate investigation to determine the cause of the problem of an incident from identification to determine the OSH problem according to company procedures. This is in accordance with the Occupational Safety and Health Management System
- (6) Findings are analyzed and reviewed, The results of the study obtained that the implementation of occupational safety and health management systems (SMK3) must conduct a review and analyze the results of hazard identification, risk assessment and risk control to ensure the effectiveness of OSH protection in a planned, measured, structured, integrated manner. This is in accordance with the guidelines for the management system safety and health (SMK3) according to Government Regulation 50 of 2012 regarding the review of the company.

**5) SMK3 internal audit**

- a. Internal audits of SMK3 in the company have been conducted regularly for the effectiveness of the implementation of SMK3. The results of the study note that the implementation of internal audit in the company in some operational activities of the company, an area or a function or any part that requires the attention of company management related to OHS risk and occupational safety and health policies in the company. Based on the statement of key informants that the audit in the company has been done once a year with the OSHAS integration system and quality management system, the environmental management system with K3 in the company with the verification agency. This is in accordance with the reference to PP 50 of 2012 concerning the Occupational Safety and Health Management System CHAPTER III article 16 paragraph (1) the evaluation of the application of SMK3 is carried out by an independent audit institution appointed by the minister at the request of the company. This study is in line with research by Juliantina (2013) stating that internal audits are conducted once every 1 year, internal audits are conducted to check the suitability of the plan and its implementation and effectiveness. And the SMK3 external audit is carried out by an audit body of the Ministry of Manpower and Transmigration of Indonesia every 3 years. The audit results are used as input for management review [12].
- b. The SMK3 audit in the company has been carried out systematically and independently by personnel who have work competencies and use the established methodology. Internal audit in the company in some operational activities of the company, an area or a function or any part that requires management attention. From the results of research, the company has carried out audits that have certification and have been trained to conduct auditors in the company. This is in accordance with the Occupational Safety and Health Management System, but according to PP 50 of 2012 the company has not yet been processed, but the company still complies with OHSAS 18001: 2008 standards. According to Kukun (2016) research, it is stated that the OHSAS Standard 18001: 2008 is based on a methodology known as the Plan-Do-Check-Act (PDCA). Plan form and the goal-setting process that is required to achieve results in accordance with the policy of the organization SMK3. Do carry out the Check process in the form of monitoring and measuring the process activities of the policies, targets, laws and regulations and other SMK3 requirements as well as reporting the results. The Act is taking action to improve S MK3 performance on an ongoing basis [13].

- c. Internal audit in the company has used the external audit criteria as listed in appendix II PP 50, and the reporter has used the report format listed in attachment III of the regulation. Based on the results of the research Implementation of the SMK3 audit to prove the implementation of SMK3, companies can be audited through an audit agency appointed by the Minister, the SMK3 audit can change or add elements according to developments regulated by the Minister, the Director has the authority to determine which companies are required to be audited based on the consideration of the level of hazard risk. However yet in PP 50 of 2012 as the company stated in the K3 Management System OHSAS companies still use the integration.
- d. Audit results must be determined based on a review of previous audit results and evidence of sources of hazards determined at the workplace. The company is required to provide the documents required for conducting the audit. The company has conducted regular reviews if there is a non-compliance with K3 management continues to evaluate the previous review and build good performance in the company. Management review is a study conducted by the management of the K3 management system. Employees receive socialization if they find that there is a non-compliance with OHS from the source of hazards in the workplace with a determined schedule, to ensure ongoing suitability, adequacy, and effectiveness. This is in accordance with the Occupational Safety and Health Management System.
- e. The audit results have been used by management in the management review process. Review and evaluation activities should be recorded and documented because it is an important source of information on the effectiveness of the company has done reviewing SMK3 an anniversary of the results of the audit because it was included in the review of the management company. This is in accordance with Government Regulation 50 of 2012.
- f. The findings of the implementation of the monitoring and evaluation of performance and SMK3 audits have been documented and used for corrective and preventive actions. From the research results company is known that the management companies are already doing repairs on the results of monitoring and evaluation of documents and management has been well preserved and corrective and preventive actions have been documented for all work units know corrective actions of management. According to PP 50 of 2012 article 13 paragraph 3, the documentation referred to at least is carried out on ( a). laws and regulations in the K3 field and standards in the K3 field ( b). K3 performance indicators ( c). work permit ( d). results of identification, assessment and risk control ( e). K3 training activities ( f). inspection, calibration, and maintenance ( g) activities. Pema record Data ( h). results of workplace accident assessments and follow-up ( i). Identify the product including its composition ( j). information regarding suppliers and contractors and ( k). SMK3 audit and review. In Subiyanto's research (2013) states that by carrying out OHS audits, management can examine the extent to which the organization has carried out mutually agreed commitments, detecting various weaknesses that still exist, which may lie in the formulation of OHS commitments and policies, or on organizing, or PDA planning and implementation.
- g. Performance monitoring and evaluation and auditing of SMK3 are guaranteed to be carried out systematically and effectively by management. Based on the research results activity monitoring work carried out to analyze the results of the implementation of activities in order to determine the success or to determine the identification of the

level of refinement. The management has guaranteed the implementation of the results of monitoring and evaluation and auditing of SMK3 in the company because in the procedure all the results of management actions must be efficient and effective to achieve OHS targets. This is in accordance with the guidelines for the implementation of the occupational safety and health management system of SMK3 PP 50 of 2012 article 14 paragraph (4) regarding performance monitoring and evaluation, the company has guaranteed its implementation effectively and efficiently for management but the implementation of the system is still not applied in the field. According to Law no. 13 of 2003 concerning manpower article 87, every company is obliged to implement a K3 management system that is integrated with company management. This law does not state what SMK3 should be used, what is important is implementing SMK3 in their respective environments. However, to find out whether an organization has implemented a well K3 management system, it is necessary to conduct surveillance by the authorized agency. One oversight mechanism is to conduct an SMK3 audit through an agency appointed by the government. The audit results illustrate how the level of application of OHS management systems in organizations is subsequently used as part of supervision and coaching, for example giving awards to organizations that have good OHS performance (Lokajaya 2015).

**6) Reviewing and improving SMK3 performance**

- a. The company has conducted regular reviews of SMK3 implementation. An ongoing review of the implementation of the Occupational Safety and Health Management System (SMK3) with the aim of improving the effectiveness of occupational safety and health. The company has been conducting a continuous review of about 6 months and an internal audit and management review to improve SMK3 in the company. This is in accordance with the Implementation of the Occupational Safety and Health Management System Government Regulation 50 of 2012 article 15 paragraph (1).
- b. SMK3 review has been able to overcome the implications of K3 on all activities, products, and services including its impact on company performance. Management has been regularly reviewing and improving the implementation of the K3 management system on an ongoing basis with the aim of improving occupational safety and health performance even though it has not been 100% maximally the company continues to make improvements and development of SMK3. The SMK3 review has been able to overcome the implications of K3 and its impact on company performance and make continuous improvements to SMK3. This is in accordance with PP 50 of 2012, but the lack of supervision has made the company not fully implement SMK3 well in the company
- c. Review of SMK3 applicants
  - (1) Evaluation of K3 policy  
Employers and administrators in the workplace must establish OHS commitments and policies as well as OHS organizations, the company has carried out commitments and implemented OHS well and is continually reviewed and evaluated for the development of SMK3. The company has conducted an evaluation of the OHS policy, even though its implementation has not been optimal yet, but management is committed to continuing a better OHS policy in the company. This is based on Government Regulation 50 of 2012 in accordance with the standards but for the maximum

achievement of SMK3, the company must be fully committed to working safely and health so that everything can be fulfilled.

- (2) OHS goals, objectives, and performance. The main purpose of applying SMK3 is to protect workers from all forms of accidents and occupational diseases. After all, workers are the company's most important assets. By applying K3 the number of accidents can be reduced or completely eliminated, this will also benefit the company because workers who feel safe from the threat of workplace accidents and occupational diseases will work more enthusiastic and productive. This is in accordance with PP 50 of 2012 concerning the Occupational Safety and Health Management System, but the company has run OHS, but it has not been 100% achieved, but management and leadership are committed to better OHS policies. The management must demonstrate its commitment to OSH through consultation and by involving workers and other parties involved in the implementation, development, and maintenance of SMK3 so that all parties feel they have ownership and feel the results a.
- (3) SMK3 audit findings and evaluation of the effectiveness of SMK3 implementation  
The audit must be determined based on a review of the results of previous audits and evidence of sources of danger obtained at the workplace. The company has not fully achieved maximum achievement of SMK3 in the company, but management continues to make continuous and continuous improvement and evaluation Audit results must be used by management in the management review process and SMK3 development Companies must have a system to measure, monitor and evaluate SMK3 performance and the results must be analyzed to determine success or identify corrective actions.
- (4) Changes in Laws. All findings from the implementation of monitoring, auditing, and review of the OHS Management System must be documented and used to identify corrective and preventive actions and the management guarantees their implementation systematically and effectively. The company has already taken corrective actions according to the rules and regulations of Law No. 13 of 2003 and Law No. 1 of 1970 concerning work safety and implemented to all work units in the company. The results of repairs will be carried out immediately if there is a change in legislation regarding OSH. This research is in line with research by Mentang (2013) which states that the legislation Every formulation of the resulting policy planning, refers to the applicable laws and regulations namely Law No. 13 of 2003 concerning Manpower, Law No. 1 of 1970 concerning Work Safety, Ministerial Regulation.
- (5) Improvements and performance improvements if there are demands from related parties or the market. The K3 Management System must be able to overcome the implications of occupational safety and health for all activities, products, and services including its impact on company performance. A good application of SMK3 will affect customer satisfaction. How many customers require their suppliers or suppliers to apply SMK3 or OHSAS 18001. Because the application of SMK3 will be able to guarantee a safe, orderly and clean process so as to improve quality and reduce defective products. The workers will work better because they are well protected so they can be more productive. The company has been effective in improving and improving the performance of other demands.
- (6) Improvements and performance improvements if there are changes in the product and company activity. The company has established a risk control program by prioritizing

work with the highest risk value. Based on company policy, the control program is also prioritized based on the previous year's unfinished program, company policies regarding the availability of funds, human resources, and technology, as well as compliance with laws and regulations. Specifically for the environmental program, consideration of proper results and compliance with laws and regulations. All procedures governing the company's operational activities are regulated in the company's management system, including the company's SMK3, which also conducts socialization of all work units and adjusts to the impacts that occur when there are product changes in a company. This is in accordance with the PP 50 the Year 2012 Occupational Safety and Health Management System article 15 paragraph (4) section c regarding changes in the company's products and activities.

- (7) Improvements and performance improvements if there is a change in the company's organizational structure. In placing the goals and objectives of a company's occupational safety and health policy, it must use performance indicators that can be measured as a basis for evaluating OSH performance which is also information about the success of SMK3 achievement. Changes in organizational structure naturally involve improving the performance of good maintenance and are implemented to achieve occupational safety and health management system and be placed according to competency. This is in accordance with the Occupational Safety and Health Management System article 15 paragraph (4) part d regarding changes in the organizational structure of the company.
- (8) Improvements and improvements in performance from the development of science and technology. The company's success in achieving its goals is management achievement. By knowing the company's performance, management will be able to evaluate, determine, and take steps with the development of science and technology and policies that are right for the survival of the company and the development of SMK3. The company develops with the presence of new technologies including epidemiology. By conducting training in engineering to be able to overcome existing problems in achieving scientific development and achieving an OHS management system. Improved performance with the development of new knowledge can have a good impact on the company and achieve performance that makes a good K3 management system. This is in accordance with PP 50 of 2012 article 15 paragraph (4) concerning the development of science and technology, including epidemiology.
  - h. Improvement and performance improvement from work accident and disease results
- (9) Based on the results of research in the company d ith own identification of occupational health and safety and occupational diseases as well as to follow the procedures in the company
- (10) can improve the performance of the company for the development of SMK3. The company is aware of OSH and identifies work accidents and occupational diseases. Companies must ensure occupational safety and health with solutions to OSH to improve performance and reduce accidents in the workplace. Investigations must be conducted regularly in high-risk and non-high-risk units. The ability of occupational safety officers in the field of operations engineering, work safety engineering, hazard control management is felt to be very insufficient so it is an obstacle to obtaining good job safety performance. As a result of these shortcomings, there is a gap between the

more advanced applied technology with a higher negative impact with the ability of safety workers in anticipating increasingly dangerous conditions. This is also caused by the lack of human resource development in the field of K3 or underdeveloped development of the world of education in this field [14].

- (11) improvements and improvements are made if there are reports, suggestions from workers/laborers. With the reporting of workers/workers can make the OSH management system better all the suggestions from the workers/workers are accommodated and become an evaluation material for SMK3. The company has implemented a system of suggestions from employees and also good advice will get money for its assessment. Suggestions from workers/workers in the analysis of the results of informal inspections are inspections that are not planned in advance and are quite simple in nature which is done on the awareness of people who find or see problems K3 in his daily work. This is in accordance with PP 50 of 2012 concerning the Occupational Safety and Health Management System article 15 paragraph (4) section h regarding input from workers/laborers.

**7) Performance Rating Based on PP Number. 50 of 2012**

In the explanation above it has been stated that the application of SMK3 in the company has been running, but from the results of interviews, field observations regarding the application of SMK3 based on PP No. 50 of 2012 that have been running include:

- a) The consultation process for workers that have been carried out every time there is a preliminary review, especially regarding occupational safety and health issues
- b) Ratified by the top leadership has been implemented, this is reinforced by physical evidence in the form of observations by researchers who were spotted by informants at the time of the interview but could not be disseminated.
- c) The policy has been disseminated that has been made by sticking to the bulletin board and by carrying out *briefings* every day before starting work.
- d) An organization that has put in place policies, authorities and responsibilities is the *Health Safety Environment* (HSE) section.
- e) Has provided a budget that is set at the beginning or end of each month by each head of the unit to the HSE.
- f) The board has assigned personnel who have clear responsibilities with the formation of special teams such as the P2K3 team who come from each unit and are given training, fire fighting teams (DAMKAR), and disaster emergency response teams.
- g) Coordinated planning, performance appraisal and compilation of plans that have been carried out once every year, which is at the coordination meeting.
- h) Carry out cooperation with other parties such as the Hypertkes and RSUD Prambanan and Panti Rini related to employee health

As for some of the criteria that have been implemented but not yet suitable include:

- a) The initial review process has been carried out on all units, but only the OHSAS certified units have been documented, namely the HE unit in the *painting* and *pretreatment* units. But everything should be documented related to the implementation of SMK3 because for policies sometimes the units that have been certified and which are not certified but have the same danger have different policies that affect the commitment and participation of worker



- b) The commitment of superiors regarding OSH can be stated less decisively because the provision of PPE, especially superiors, is less responsive and only provide standard PPE.
- c) Inadequate Human Resources due to frequent rotations that affect the ability of workers and retraining must be carried out.
- d) The lack of participation of workers/employees is caused by the inconvenience of PPE and the lack of firmness by the leadership of workers.
- e) Poorly maintained facilities and infrastructures such as danger signs and safety lines.

#### **4. CONCLUSION**

Based on the results of the study as described in the previous chapter several conclusions can be drawn, namely:

1. Determination of K3 policy with reference to PP No.50 of 2012 in PT.MAK in 2016 Determination of policies on the application of SMK3 includes policy formulation, policy setting, implementing provisions no: 2, conducted a review, the level of leaders shows commitment and workers/workers have participated has been implemented but not yet going well.
2. OHS Planning with reference to PP No.50 of 2012 in PT.MAK in 2016 has been prepared properly which includes Entrepreneurs formulating OHS plans based on the results of preliminary review, identification of potential hazards, assessment and risk control, based on legislation and resources that are owned and K3 Plan compiled by the company contains at least the goals and objectives, priority scale, hazard control efforts, determination of resources, implementation period, achievement indicators and accountability system
3. The implementation of the K3 plan with reference to PP No.50 of 2012 at PT.MAK in 2016 has largely been carried out such as providing adequate resources and providing some adequate facilities and infrastructure.
4. PT. Mega Andalan Kalasan that the company has monitored and evaluated the results of examinations, tests and measurements in collaboration with third parties and officers who have competence in conducting tests that have met the K3 standard and the test records have been properly stored in the management department and carried out corrective actions if there is a non-compliance with the OHS requirements of an incident and the management immediately reviews the findings, however from the monitoring and evaluation of OHS performance is still not fully implemented by employees or workers in the field
5. PT. Mega Andalan Kalasan has conducted an internal audit that is scheduled once a year with the OHSAS 18001 system.
6. Monitoring and improving the performance of SMK3 based on Government Regulation No. 50 of 2012, most of which have conducted a review of what has been scheduled every 6 months a year and internal audits and management reviews.
7. The implementation of occupational safety and health management systems (SMK3) with reference to PP No.50 of 2012 and the basic principles of occupational safety and health management systems (SMK3) in PT.MAK in 2016 are mostly already running but not in accordance with the references.
8. There is a discrepancy with PP No. 50/2012 concerning communication and provision of signposts, namely the initial review process that is certified in only HE units, superiors' commitments regarding OSH, inadequate Human Resources, Inadequate Participation of

Workers / Employees, Facilities and Poorly maintained infrastructure. However, the company that actually applied was OHSAS

## REFERENCES

- [1] Mentang, M.I.F. (2013). Jurnal. Evaluasi Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja pada Peningkatan Fasilitas PT. TRAKINDO UTAMA Balikpapan. Universitas Sam Ratulangi. Diunduh tanggal 20 Oktober 2016.
- [2] MOH, 2014
- [3] ILO, 2016 accessed 1 October 2016 ).
- [4] Widowati, E. (2016). Evaluasi Penerapan ABg (Aktif Berbagi) Sistem Sebagai Upaya Mengurangi Angka Kecelakaan Kerja di PT. COCA-COLA Amatil Indonesia Central Java. Jurnal. Universitas Negeri Semarang. Diunduh tanggal 20 Oktober 2016.
- [5] Walangitan dkk., (2012). Penerapan sistem manajemen keselamatan dan kesehatan kerja (SMK3) pada proyek konstruksi di indonesia (studi kasus: pembangunan jembatan Dr. Ir. Soekarno-Manado). Jurnal. Universitas Sam Ratulangi. Diunduh tanggal 29 juli 2017
- [6] . Sucipto, C.D., (2014). *Keselamatan dan Kesehatan Kerja*. Tangerang: Gosyen Publishing.
- [7] Herdiansyah, (2010). *Metode penelitian kualitatif untuk ilmu-ilmu social*. Jakarta Selatan: penerbit Edward Tanujaya.
- [8] Saryono & Anggraeni., (2013). *Metodologi penelitian kualitatif dan kuantitatif dalam bidang kesehatan*. Penerbit Erlangga.
- [9] . Sugiyono., (2014). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Penerbit Alfabeta
- [10] Moleong., (2012). *Metodologi Penelitian Kualitatif*. Bandung: PT Remaja Rosdakarya.
- [11] . Pangkey, F. (2012). Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) Pada Proyek Kontruksi di Indonesia (studi kasus: Pembangunan Jembatan Dr. Ir. Soekarno-Manado). Jurnal. Universitas Sam Ratulangi. Diunduh tanggal 20 Oktober 2016.
- [12] Juliantina. (2013). Evaluasi Penerapan Sistem Manajemen Keselamatan Dan Kesehatan Kerja (SMK3) Pada Proyek Persiapan Lahan Pusri Iib PT. PUPUK SRIWIDJAJA PALEMBANG. Jurnal. Diunduh tangal 5 Agustus 2017
- [13] \_Lango kukun. (2015). Sistem manajemen Keselamatan dan Kesehatan kerja (SMK3) pada PT. PERTAMINA (PERSERO) Terminal BBm Kijang. Universitas Maritim Raja Ali Haji TanjungPinang. Diunduh tanggal 13 juli 2017.
- [14] Sari, J.T. (2015). *Penerapan Program Kesehatan dan Keselamatan Kerja di PT. Pama Persada Nusantara Distrik Jembayan Kabupaten Kutai Kartanegara*. jurnal. Universitas Mulawarman. Diunduh tanggal 1 agustus 2017
- [15] Lestari, T. (2010). Hubungan Keselamatan dan Kesehatan Kerja (K3) dengan Produktivitas Kerja Karyawan (Studi Kasus: Bagian Pengolahan PTPN VIII Gunung Mas, Jurnal. IPB.
- [16] Nugraha, O.M.C. (2015). Gambaran Penerapan Sistem manajemen Keselamatan dan Kesehatan Kerja (SMK3) berdasarkan OHSAS 18001: 2007 di PT. ASIA PACIFIC FIBERAS TBK. Kaliwungu Kabupaten Kendal Tahun 2015. Skripsi. Universitas Negeri Semarang. Diunduh tanggal 20 Oktober 2016.

- [17] Abidin, A.U. (2015). Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) dan Faktor yang Berpengaruh Pada Kejadian Kecelakaan Kerja di PT. Mega Andalan Kalasan Kabupaten Sleman. Tesis. Universitas Gadjah Mada Yogyakarta. Diunduh tanggal 17 Oktober 2016.
- [18] Ajib, A.L. (2016). Factor-Faktor yang berhubungan dengan Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) PT. KUBOTA INDONESIA. Skripsi. Diunduh tanggal 28 juli 2017
- [19] Buntarto., (2015). *Panduan Praktis Keselamatan & Kesehatan Kerja untuk Industri*. Yogyakarta: Pustaka Baru Press
- [20] Handoko. (2014). Manajemen personalia & sumberdaya manusia. Yogyakarta: BPFE-YOGYAKARTA
- [21] Hermiati. (2013). Pengaruh Sistem Manajemen Keselamatan dan Kesehatan Kerja Terhadap Kinerja Karyawan PT. ADHI KARYA. Jurnal. Fakultas Ilmu dan Ilmu Politik. Diunduh tanggal 17 Oktober 2016.
- [22] Jurnal. Diunduh tanggal 5 Agustus 2017
- [23] Kementerian Kesehatan Republik Indonesia (2014) *1 orang pekerja di dunia meninggal setiap 15 detik karena kecelakaan kerja* <http://www.depkes.go.id/article/view/201411030005/1-orang-pekerja-di-dunia-meninggal-setiap-15-detik-karena-kecelakaan-kerja.html> Diunduh tanggal 21 November 2016.
- [24] *Kementerian Tenaga Kerja dan Transmigrasi R.I Direktorat jenderal Pembinaan Pengawasan Ketenagakerjaan Direktorat Pengawasan Norma Keselamatan Dan Kesehatan Kerja Tahun 2012*. Peraturan Pemerintah Nomor 50 Tahun 2012. Diunduh Tanggal 29 Oktober 2016.
- [25] Mega Andalan Kalasan. <http://www.mak-techno.com/id/>. Diunduh tanggal 2 November 2016
- [26] Nugraha, O.M.C. (2015). Gambaran Penerapan Sistem manajemen Keselamatan dan Kesehatan Kerja (SMK3) berdasarkan OHSAS 18001: 2007 di PT. ASIA PACIFIC FIBERAS TBK. Kaliwungu Kabupaten Kendal Tahun 2015. Skripsi. Universitas Negeri Semarang. Diunduh tanggal 20 Oktober 2016.
- [27] *Peraturan Pemerintah Nomor 50 tahun 2012 Tentang Penerapan Sistem Manajemen Keselamatan dan Kesehatan Kerja*. Diunduh tanggal 17 November 2016
- [28] Salafudin, M. (2013). Implementasi Sistem Manajemen Keselamatan dan Kesehatan Kerja di PT. PLN (persero) Are Pengatur Distribusi Jawa Tengah dan D.I. Yogyakarta dalam Upaya Peningkatan Mutu dan Produktifitas Kerja Karyawan. Jurnal. Universitas Negeri Semarang. Diunduh tanggal 15 Oktober 2016.
- [29] Swastika, M (2011). Penerapan komitmen dan kebijakan serta perencanaan K3 sebagai salah satu langkah implementasi SMK3 di PT. Telkom area solo. Diunduh tanggal 13 juli 2017
- [30] Setyawan. (2013). *Kecelakaan kerja di sleman capai 143 kasus*. <http://daerah.sindonews.com/read/801726/22/kecelakaan-kerja-di-sleman-capai-143-kasus-138355139>. 29 Oktober 2016
- [31] Saleh, L.M. (2013). Analisis Implementasi Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) pada Bengkel Politeknik Negeri Ambon. Tesis. Teknik Sipil Universitas Brawijaya Mlang. Diunduh tanggal 20 Oktober 2016.

- [32] Subiyanto, M. H. (2013). *Implementasi Sistem Manajemen Keselamatan dan Kesehatan Kerja di PT PLN (Persero) Area Pengatur Distribusi Jawa Tengah & D.I Yogyakarta dalam Upaya Peningkatan Mutu dan Produktivitas Kerja*. Universitas Negeri Semarang. Diunduh tanggal 4 Agustus 2017
- [33] Satori, M.A & Komariah, M.Pd, (2013). *Metodologi penelitian kualitatif*. Bandung: penerbit Alfabeta
- [34] Santoso, E.G. (2016). Standarisasi, Monitoring dan Compliance Kebersihan dan K3. Jurnal. Universitas Kristen Petra. Diunduh tanggal 20 Oktober 2016.
- [35] Septiani, D.R. (2014). Persepsi Tenaga Kerja Tentang Sistem Manajemen Keselamatan dan Kesehatan Kerja (SMK3) dan Pedoman Penerapan SMK3 di PT.BARATA INDONESIA (PERSERO) Unit Usaha Mandiri Tegal. Skripsi. Universitas Diponegoro. Diunduh tanggal 20 Oktober 2016.
- [36] Wibowo., (2011). *Manajemen Kinerja*. Jakarta: PT. Rajagrafindo Persada.