

Conference Paper

Updating Hazard Identification, Risk Assessment, and Determining Control (HIRADC) Document: Case Study at Schneider Electric Cikarang, Indonesia

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Abstract

Occupational Health and Safety plays a crucial role in the institution or organization. The purpose of Occupational Health and Safety (OHSAS) is to ensure the health and safety of the work. To fulfil the purpose, the institution or organization need to have a good work safety and health management system. OHSAS 18001: 2007 is an international standard for the implementation of work safety and health management system. One of the clauses contained in OHSAS 18001: 2007 are hazard identification, risk assessment, and determining controls and these can be documented in the HIRADC (Hazard identification, risk assessment, and determining control) document. HIRADC is divided into three parts: Hazard Identification, Risk Assessment, and Determining Control. HIRADC, which is annually reviewed and updated by the management, discovers and controls the potential hazards that exist around the working environment. It goes in line with OSHAS 18001:2007 and ISO 14001:2004.

Keywords: Risk management, Safety and Health Management System, workplace hazard

1. Introduction

Schneider Electric Cikarang is located at East Jakarta Industrial Park (EJIP) Plot 4B1-B2, South Cikarang, Bekasi, West Java, Indonesia. Schneider Electric Cikarang is one of the few factories that Schneider Electric Indonesia have and producing electronics, for example LV Panel, MC Set, PIX, SM6, etc. Schneider Electric Cikarang have a vision to be the global specialist in energy management, and the purpose is every energy user can feel safe, reliable, efficient, productive, and environmental friendly.

Schneider Electric Cikarang always doing continuous improvement to increase the costumer and worker satisfaction. Currently Schneider Electric Cikarang have more than 1 000 workers, and still counting every year. Production of Schneider Electric Cikarang

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Indonesia contribute as 62 % to production Schneider Electric. The rest is distributed to the countries in Asia, like Malaysia, Singapore, Australia, etc.

Schneider Electric Cikarang have some system management certification, like ISO 9001, ISO 50001, and in 2013 Schneider Electric Cikarang got an achievement as manufacture industries that have a good and consistent performance in implementing Indonesia's national standards at SNI Awards event. Schneider Electric Cikarang not only focus on the customer satisfaction, but also the worker satisfaction. This thing can be proven by the exist of SERE (Safety, Environment, Real Estate) Department. SERE Department main job is to ensure the work is harmless for the worker. First aid historical data in Schneider Electric Cikarang on 2017 shows that 40 % work accident caused by the process can't be processed using the PPE and 60 % work accident caused by the operator exposed to a sharp plate because the operator not using PPE. The accident must be decreased on the next year to fulfil the SERE Department objectives. In order to decrease the accident that occurs in the process, a HIRADC (Hazard Identification, Risk Assessment, and Determining Control) method is needed to controls the potential hazards that exist around the working environment. The research addressed two questions. First, what is the update for HIRADC 2018 Document? Second, what is the right way to control the potential hazard? This research aims to update HIRADC document based on the current condition, and determine the right risk control to reduce potential hazard that exist around the working environment

2. Conceptual models

Today's companies have variety of solutions that can decrease the potential hazard that exist around the working environment. HIRADC assessment one of innovation that can reduce the potential hazard in the working environment. This research using HIRADC assessment as the key to decrease the potential hazard that exist in the working environment. Conceptual models in this research is given in Figure 1 based on conceptual modeling [1].

In HIRADC assessment, SERE Department have the roles to manage HIRADC assessment until all department understand the importance of HIRADC and involved in the assessment. Each party that involves in the process can also connecting with HIRADC assessment. The health and safety of the worker will increase, the process more efficient and effective, and increasing the worker involvement in the company health and safety program [2].

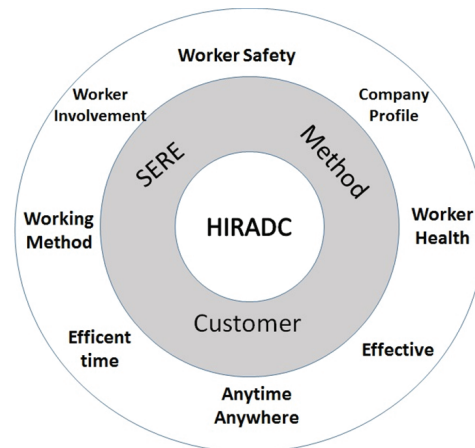


Figure 1: Conceptual models

3. Research methodology

3.1. Health and safety management system (HSMS)

HSMS is the part of the organization management system that used to develop, realizing work safety policy, and control the risk of work safety in the organization [3]. OHSAS 18001:2007 and ISO 14001:2004 shows that the implementation of HSMS is the way to analyze a risk from a job. The benefit from implementing HSMS are [4]:

1. Shows the company compliance for the government rules about company responsibility to protect every worker.
2. Reduce cost that come from the work accident.
3. Create the effective management system that so every work process have a clear objectives and coordinated.
4. Increase the worker and customer satisfaction.

3.2. OHSAS 18001:2007

OHSAS 18001:2007 is a document or certificate from British Standards Institute (BSI) to set the applied HSMS in the company. OHSAS 18001:2007 requirements applied for all kind of organization without looking the size of its company. The purpose of OHSAS 18001:2007 is to prevent work accident in the working environment [5].

3.3. ISO 14001:2004

ISO 14001:2004 is an international standard from International Organization for Standardization that organize about environment management system. Environment Management System (EMS) are one of a few management system components. A few points in ISO 14001:2004 are: organization structure, activity plan, responsibility, training, procedure, process development, and compliance to the environment policy [6].

3.4. Hazard identification, risk assessment, and determining control (HIRADC)

HIRADC have a tight relationship with OHSAS 18001:2007 (clausal 4.3.1) and ISO 14001:2004. The result from HIRADC assessment is used to define the health and safety purpose that the company wants to achieve. The HIRADC assessment can help the company to find the potential hazard in the working environment [7].

3.5. Hazards identification

Hazard identification is use to know the potential hazard in the working environment. In this stage the company will find all the risk or hazards in the working environment. This potential hazard must be founded before causing any impact for the company [8].

3.6. Risk assessment

Potential hazard that founded on the hazard identification stage will be scored in this stage. The purpose of the scoring is to define the risk level of the hazards. This risk assessment is guided by Australian Standard/New Zealand Standard for Risk Management [9]. This risk assessment considers two factor, there is probability and severity [10]. Scale of the scoring can be seen at Table 1, Table 2, and Table 3.

TABLE 1: Probability scale AS/NZS 4360 standard.

Level	Description
1	Insignificant
2	Minor
3	Moderate
4	Major
5	Catastrophic

TABLE 2: Severity scale AS/NZS 4360 standard.

Level	Description
1	Rare
2	Unlikely
3	Possible
4	Likely
5	Almost Certain

TABLE 3: Risk matrix scale AS/NZS 4360 standard.

Risk Frequency	Risk Level Description				
	1	2	3	4	5
1	L	L	M	M	H
2	L	L	M	M	H
3	L	M	H	H	H
4	M	M	H	H	E
5	M	H	H	E	E

4. Findings

HIRADC assessment is begin with hazard identification in all process and activity at Schneider Electric Cikarang. Every potential hazard will be analyze in risk assessment process. The result from risk assessment will be used as the trigger for scoring the risk.

4.1. Data collection

Hazard identification is applied to all process and activity in Schneider Electric Cikarang. Hazard identification can be executed by doing interview, observation, and historical data. The interview is held within the operator, supervisor, manager, and all staff. Historical data that was used is the first aid data at Schneider Electric Cikarang on 2017. First aid document at Schneider Electric Cikarang 2017 is given on Table 4.

TABLE 4: First aid document at Schneider Electric Cikarang 2017

No	Date	Cause	Department	Victim's Name	Leader
1	April, 13	Do not use Personal Protective Equipment (PPE), Sharp plate	Production SM6	Suciawan	Suprpto
2	May, 6	Do not use PPE, Sharp plate	Warehouse	Otim	Amiadji
3	July, 31	Bruising on the hands	Project Management (PM)	Risma	Marigan
4	September, 15	Do not use PPE, Sharp plate	Production SM6	Aditya	Aris Budianto
5	December, 20	Motor Driving, Slip	Adaptation	Syawaladi	Suyono

4.2. HIRADC analysis

Risk assessment (guided by Australian Standard/New Zealand Standard for Risk Management (AS/NZS 4360:2004)) is held for all process in the company. This step considers likelihood and severity. Risk assessment is held for every hazard that founded by interview, observation, historical data, and brainstorming. Potential hazard in level moderate, high, and extremely high must be executed immediately because the process could harm the workers. The result of HIRADC analysis in all activities at Schneider Electric Cikarang is given on Table 5.

From the HIRADC analysis result, 75.68 % of all potential hazard are on the low risk level, 24.19 % on risk level moderate, and 95 % risk level moderate is caused by the operator rolls up the sleeve, because of that the operator can be harm because of the sharp metal part. High risk level is as 0.13 % will be processed on the OTP (objectives, target, and programs of department) document.

4.3. Change in HIRADC document 2018

The change on process or activity can be happen at all time, because of that there's some change that happen from HIRADC document 2017 to HIRADC document 2018. The change of the process or activity is given on Table 6.

TABLE 6: HIRADC Analysis Result

No.	HIRADC 2017	HIRADC 2018
1	There's no assembly <i>shutter mechanic</i> process on the jig (<i>Assy joint frame cassette-MC Set</i>)	Additional process assembly <i>shutter mechanic</i> at jig (<i>Assy joint frame cassette-MC Set</i>)
2	Move panel with <i>skate trolley</i> to FQC area(SM6 SW)	Move panel to <i>skate trolley overhead crane</i> (SM6 SW)

TABLE 5: HIRADC Analysis Result.

Department	Total Risk	Risk Level			
		Low	Moderate	High	Extremely High
Packing & Delivery	153	145	5	3	0
Production MCCB	35	25	10	0	0
Production CB	40	18	19	3	0
Production ACB	77	44	33	0	0
Production Busbar	183	144	39	0	0
Emergency	35	35	0	0	0
Production FQC LV	92	75	17	0	0
Production FQC MV	114	92	22	0	0
Production IQC	125	111	14	0	0
Production LV	376	276	100	0	0
Maintenance	112	104	8	0	0
Production MC Set	243	162	81	0	0
Motorpart	288	191	97	0	0
Production PIX	345	247	98	0	0
Production Recloser	109	66	43	0	0
PoductionRM 6	174	98	76	0	0
Production SM6 CB	787	552	235	0	0
Production SM6 SW	636	463	173	0	0
Warehouse	153	145	8	0	0
General Affair(GA)	404	398	6	0	0
Total	4 481	3 391	1 084	6	0
Proportion	100 %	75.68 %	24.19 %	0.13 %	0.00 %

No.	HIRADC 2017	HIRADC 2018
3	Lift the trolley to lifting (<i>Frame panel CB assy-SM6 CB</i>)	There's no trolley lifting process lifting (<i>Frame panel CB assy-SM6 CB</i>)
4	Panel size isn't match with the trolley size (SM6)	There's safety tools to match panel with the trolley
5	There's no place the panel to <i>interchange</i> DMW process (<i>Assy connection CB to deflector-SM6 CB</i>)	Additional process - place the panel to <i>interchange</i> DMW (<i>Assy connection CB to deflector-SM6 CB</i>)
6	There's no tightening CB place with the torsion process (<i>Assy connection CB to deflector-SM6 CB</i>)	Additional process - tightening CB place with the torsion process (<i>Assy connection CB to deflector-SM6 CB</i>)
7	Forklift operator isn't looking forward while driving the forklift (<i>Kitting--Warehouse</i>)	Forklift operator always looking forward while driving the forklift (<i>Kitting--Warehouse</i>)

No.	HIRADC 2017	HIRADC 2018
8	No VT 3 phase checking process with 3 phase voltmeter (TTR-FQC MV)	Additional VT 3 phase checking process with 3 phase voltmeter (TTR-FQC MV)
9	The squatter operator when the TTR (FQC MV) test process	The operator does not squat when the TTR (FQC MV) test process
10	No process to adjust panel with specifications (IP Check-FQC MV)	Additional process of customizing panels with specifications (IP Check-FQC MV)
11	The process of installing tarpaulins on packing panels (packing)	There is no process of installing tarpaulins on packing panels (packing)
12	The process of support CT support using rubber hammer (support CT preparation-Motorpact)	There is no process of support CT support using rubber hammer (support CT preparation-Motorpact)
13	There is no process of inserting a panel into a chest (finishing-reclose)	Additionally the process of inserting a panel into a chest (finishing-reclose)
14	There is no process of inserting the tank into the casket (finishing-reclose)	Additional process of inserting the tank into the casket (finishing-reclose)
15	There is no risk of back pain in the process of installing CT cores (CT/VT assy- RM6)	Additional risk of back pain in the process of installing CT cores (CT/VT assy-RM6)
16	Process of moving CT/VT from trolley to Panel (CT/VT assy-RM6)	Change the process of moving CT/VT from trolley to jig
17	Process of moving CT / VT from trolley to Panel (CT/VT assy-RM6)	Change the process of moving CT/VT from jig to panel (CT/VT assy-RM6)
18	There is no risk of noise compressor noisy on the process of using salt spray test machine for testing (salt spray test-IQC)	Additional noise risk of a noisy compressor in the process of using salt spray test machine for testing (salt spray test-IQC)
19	Activity of moving the busbar to the test table manually (thickness plating test-IQC)	There is no activity to move the busbar to the test table manually (thickness plating test-IQC)
20	There is no process of putting a CT/VT box into a conveyor (DTR/TTR Test- IQC)	Additional process of putting CT/VT box into conveyor (DTR/TTR Test-IQC)
21	Activity use coolant for drilling process (drilling process-Busbar fabrication)	There is no coolant use activity for drilling process (drilling process-Busbar fabrication)
22	There is no Insul Boot process on Busbar Fabrication	Additional Insul Boot process on Busbar Fabrication
23	There is no risk of goods falling on the packing process (ACB)	Additional risk of goods falling on the packing process (ACB)
24	There is no risk of breakers falling on the repacking process (ACB)	Additional risk breakers fall on the repacking process (ACB)
25	There is a risk of tiptoe operators when putting cardboard on the top of the pile (repacking-MCCB)	There is no risk of tiptoe operators when laying cardboard on the top pile (repacking-MCCB)
26	Activity use coolant for drilling process (drilling process-Busbar fabrication)	There is no coolant use activity for drilling process (drilling process-Busbar fabrication)
27	Current control for any activity where there is a risk of sharp metal part is the use of gloves only	Current control for any activity where there is a risk of sharp metal part is the use of gloves and long-sleeved shirts

5. Conclusion

Results from HIRADC assessment show that as much as 75.68 % of all potential hazards found in all activities or processes at Schneider Electric Cikarang have low risk level. A total of 24.19 % of all potential hazards found in all activities or processes at Schneider Electric Cikarang have a "moderate" risk level. The risk of hazard at the 95 % moderate level is due to the rolling activity of the sleeve, so the operator is exposed to a sharp metal part. If these hazard risks can be overcome, then the potential hazard to moderate risk level may drop by 1.14 %. A total of 0.13 % of all potential hazards found in all activities or processes at Schneider Electric Cikarang have a high risk level. As much as 0 % of all potential hazards found in all activities or processes at Schneider Electric Cikarang have an "extremely high" risk level. Any activity or process that has potential risks with "moderate", "high" and "extremely high" risk levels will be followed up by the relevant departments and documented on OTP document.

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