Gambaran Penerapan *Hazard Identification Risk Assessment And Determining Control* (Hiradc) Pada Pengangkatan Girder Di Pt Wika Proyek Pembangunan Stasiun Kereta Cepat Halim

Overview Of The Implementation Of Hazard Identification Risk Assessment And Determining Control (HIRADC) on Girder Lifting at PT WIKA Halim High Speed Train Station Construction Project

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Abstract. *Infrastructure development at PT. WIKA's Halim High Speed Train Station Construction Project certainly involves a lot of human resources and a variety of equipment. However, this construction activity can cause undesirable impacts, including aspects of work safety and the environment. Therefore, construction activities must pay attention to applicable K3 standards and provisions. There are several high risk lifting jobs in the Halim High Speed Train Station Construction Project, including aspects of danger posed by workers, equipment, materials and the environment. Then a risk assessment matrix is carried out by calculating the multiplication between probability and severity and the risk level emerges in girder lifting work. The aim of this research is to find out an overview of the implementation of Hazard Identification Risk Assessment and Determining Control (HIRADC) in girder transportation work at PT WIKA Halim High Speed Train Station Construction Project in accordance with Minister of PUPR Regulation No.10 of 2021. Data processing carried out in this final project uses qualitative method with secondary data collection. The company has a HIRADC program that identifies hazards, assesses risks and controls risks. The making of the HIRADC itself is carried out by paying attention to the sequence of work stages contained in the IK (Work Instructions) with Doc No: WIKA-BG-PDSMM-IK-44 and Ref: 0440/DIR/KCIC/04.19 so that the HIRADC maker can assess potential hazards from each stage of work activities. and has implemented hazard recognition, risk assessment and risk control in girder lifting work. Programs, procedures and implementation are in accordance with PUPR regulation No. 10 of 2021 concerning Construction Safety Management Systems (SMKK).*
Keywords: *HIRADC, WIKA Building, Construction, Girder*

Abstrak. Pembangunan infrastruktur di PT. WIKA Proyek Pembangunan Stasiun Kereta Cepat Halim tentunya melibatkan banyak sumber daya manusia dan peralatan yang beragam. Namun kegiatan konstruksi ini dapat menimbulkan dampak yang tidak diinginkan antara lain aspek keselamatan kerja dan lingkungan. Oleh karena itu kegiatan konstruksi harus memperhatikan standart dan ketentuan K3 yang berlaku. Ada beberapa pekerjaan pengangkat yang beresiko tinggi pada Proyek Pembangunan Stasiun Kereta Cepat Halim diantaranya aspek bahaya yang ditimbulkan dari pekerja, peralatan, material, dan lingkungan kemudian dilakukan *matriks* penilaian risiko dengan perhitungan perkalian antara kemungkinan dan keparahan dan muncul tingkat risiko pada pekerjaan pengangkatan *girder.* Tujuan dari penelitian ini untuk mengetahui gambaran penerapan *Hazard Identification Risk Assessment and Determining Control* (HIRADC) pada pekerjaan pengangkutan *girder* di PT WIKA Proyek Pembangunan Stasiun Kereta Cepat Halim sesuai dengan Permen PUPR No.10 Tahun 2021. Pengolahan data yang dilakukan pada tugas akhir ini menggunakan metode kualitatif dengan pengumpulan data sekunder. Perusahaan memiliki program HIRADC yang mengidentifikasi bahaya, menilai risiko dan risiko pengendalian. Pembuatan HIRADC itu sendiri dilakukan dengan memperhatikan runtutan tahapan pekerjaan

yang terdapat dalam IK (Instruksi Kerja) dengan No.Dok: WIKA-BG-PDSMM-IK-44 dan Ref : 0440/DIR/KCIC/04.19 sehingga pihak pembuat HIRADC dapat menilai potensi bahaya dari setiap tahap kegiatan pekerjaan. dan telah mengimplementasikan pengenalan bahaya, penilaian risiko, dan pengendalian risiko pada pekerjaan pengangkatan *girder* . Program, prosedur, dan pelaksanaan sudah sesuai dengan permen PUPR No 10 tahun 2021 tentang Sistem Manajemen Keselamatan Konstruksi (SMKK).

Kata Kunci: HIRADC, Gedung, Konstruksi, *Girder*

INTRODUCTION

Construction projects are included in the industrial sector that has a relatively high risk of work accidents. One of the construction jobs that has many work accidents is girder work. From Kompas.com data in 2017 there have been work accidents especially in girder erection work on infrastructure development projects in Indonesia. Among them, there have been 5 work accidents in girder erection work, for example on September 22, 2017 a girder fell on the Bocimi Project (Bogor, Ciawi, Sukabumi), on October 29, 2017 a girder fell on the Paspro Toll Road project (Pasuruan-Probolinggo), on December 9, 2017 a girder fell on the Ciputrapinggan Bridge project, on December 30, 2017 a girder fell on the Pemalang-Batang Toll Road Project, and on December 22, 2017 a girder fell on the Depok-Antasari Toll Road project. Based on the work accident data above, lifting girders has a high potential for work accidents, so it is necessary to analyze the causes, risk management that can cause accidents, reduce the risk of danger and prevent it from happening again. For this reason, the author is interested in conducting analysis and research on the General Overview of the Implementation of Hazard Identification Risk Assessment and Determining Control (HIRADC) on Girder Work at the PT WIKA Bangunan Gedung Project with the Regulation of the Minister of PUPR No. 10 of 2021. According to Nur Asiah [5] risk is the possibility of an unexpected or unwanted loss, so that uncertainty or the possibility of something happening which if it happens will result in a loss. So risk management is a method or science that studies various risks, how they occur and manages these risks with the aim of avoiding losses.

HIRADC is a process of hazard identification, measurement, and evaluation of risks that arise due to a hazard that can occur in routine or non-routine activities in a company to then conduct a risk assessment of the hazard. The results of the risk assessment are useful for creating a hazard control program so that the company can minimize the level of risk that may occur so as to prevent work accidents [1].

The implementation of risk management standards in most organizations is to increase productivity and reduce program deviations. Therefore, risk management functions to organize in a structured manner the actions needed to identify, evaluate, and respond to risks in a project. The success or failure of a project in achieving its predetermined objectives is highly dependent on the suitability of the capabilities of its implementation system [2]. Effective risk management is essential to achieving project objectives and meeting sustainable development [9] because risk requires a strong understanding of how to manage uncertainty and complexity [4].

Hazard Identification Provides a variety of benefits including[10]:

1. To reduce the possibility of accidents, because hazard identification is related to the factors that cause accidents.
2. Providing an understanding to all parties regarding the potential dangers of company activities so that they can increase awareness in carrying out company operations.
3. As a basis and input to determine the right and effective prevention and security strategies. By knowing the existing dangers, management can determine the priority scale of handling according to the level of risk so that the results are expected to be more effective.
4. Provide documented information about the sources of danger in the company to all parties, especially stakeholders. Thus they can get an idea of the business risks that will be carried out.

Based on the Regulation of the Minister of PUPR No. 10 of 2021, risk assessment is carried out using two parameters, namely frequency and severity. Frequency is how often a hazard occurs, while severity is the level of severity/loss/impact caused by the hazard. The combination of frequency and severity values will produce a risk level.

Risk control is an activity that can control, reduce or eliminate the impact of hazards that arise, either as initial control or additional efforts.[6]. In the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 10 of 2021, risk control must apply control analysis based on engineering aspects (engineering control), management aspects (administrative control), human behavior aspects and aspects of change and dynamics of construction work (implementation of change management).

RESEARCH METHODS

Collection Data

This research was conducted using qualitative methods [9], data was obtained from observation results. direct observation in the field to find out whether the process of implementing girder work is in accordance with the procedures set by the company, starting from the preparation, implementation and post-work stages, in addition the researcher conducted interviews by asking questions about the implementation of Hazard Identification Risk Assessment and Determining Control (HIRADC) to HSE and workers who carry out girder work. Documentation in research obtained through company records in the form of policy documents. company, related regulations, work procedures/work instructions, and other documents related to the implementation of Hazard Identification Risk Assessment and Determining Control (HIRADC) in PT WIKA's project is developing the Halim High Speed Train Station .

Processing Data

Data processing is carried out using the comparative method of the Minister of PUPR Regulation Number 10 of 2021 concerning the Construction Safety Management System (SMKK) with a description of the implementation of the Hazard Identification Risk Assessment and Determining Control (HIRADC) on the girder assignment work on the PT WIKA Halim High-Speed Train Station construction project by describing the data in the form of regular and effective sentences so that it is easy to understand.

RESULTS AND DISCUSSION

To encourage the achievement of the implementation of the Construction Safety Management System (SMKK) at PT WIKA Bangunan Gedung, related to the risk control program carried out by each department based on the Regulation of the Minister of PUPR Number 10 of 2021, namely creating HIRADC for the appointment of revised girder work at least once a year or if there is new work.

The creation of HIRADC in the Halim High-Speed Train Station Development Project was carried out according to standards, namely with the stages of hazard identification, risk assessment, and control. The creation of HIRADC itself was carried out by considering the sequence of work stages stated in the work instructions with No. Doc: WIKA-BG-PDSMM-IK- 44 and Ref: 0440 / DIR / KCIC / 04.19 so that the HIRADC maker can assess the potential hazards at each stage of the work activity.

The company's efforts in preventing and protecting workers, workplaces, and the environment from potential hazards in girder lifting work by implementing risk management using the HIRADC method. In this company, risk management actions are carried out by competent people such as HSE so that they can determine the influence or consequences of hazards.

HIRADC is created by all functions and coordinated with HSE, the following is the flow of creating HIRADC through continuous stages and steps:

1. Girder Lifting Work
   Every job that is done must have a level of risk or several hazards that can occur. In this final assignment, the collection of hazard identification data is carried out by looking at company data. The results of the risk identification are used to support the creation of HIRADC.
2. Risk Assessment On Girder Work
   The assessment aims to evaluate the magnitude of the risk and the impact that will be caused. Risk assessment is used as a step to determine the level of risk in terms of the possibility and severity that can be caused. Risk assessment is carried out by calculating the multiplication of the possibility (likelihood) with the severity that can be caused (severity). The assessment of the girder lifting work has a risk value of 25 in the assessment obtained at an extreme risk level. The following is a risk assessor for girder lifting work (Purnama, I. 2022:58) [7] .

Risk Level = Likelihood (F) x Severity (A)
Risk Level = 5 × 5
Risk Level = 25

3. Risk Control in Girder Work
   Determination of the form of control efforts takes into account the basic hierarchy of control, namely elimination, substitution, engineering control, administration and provision of PPE as follows:
   a. Elimination
      Accidents occur due to lifting equipment, which means we have to check the condition of the equipment and slinky and lifting equipment before mobilizing it.
   b. Substitution
      Device failures and equipment must be replaced no more than 15 years ago.
   c. Engineering
      Create work instructions that are socialized to workers, so that workers understand what procedures are carried out in the work.
   d. Administration
      Conducting the creation of work method documents, risk assessments and JSAs so that workers have the necessary documentation to state whether the documents are valid or not.
   e. Personal protective equipment
      Always provide equipment appropriate to the job, to minimize health risks to employees, such as using safety vests, safety shoes, gloves, and safety helmets.
4. The next stage is to prepare a draft HIRADC table on the girder lifting work based on the results of hazard identification, risk assessment and interrelated risk control. This draft HIRADC table will be used for verification to experts such as HSE, engineering and production and is used to calculate the risk level of girder lifting work at PT WIKA. The draft HIRADC table that has been made can be seen in the table below:

Table 1. Hazard Identification, Risk Assessment and Determination of Control (HIRADC) in Girder Lifting Work in the Halim High Speed Train Station Development Project PT WIKA

Information Risking			**Legislation Or Condition**	**Evaluation Level Risking**				**Control Risking Beginning**	**Evaluation Remainder Ririko**				**Control Risking Advanced**
Information Work	**Identification Danger 1. Workers 2. Equipment 3. Ingredients 4. Environm**	**Risking 1. Workers 2. Equipment 3. Ingredients 4. Environment/Public**		**Possible Nan (F)**	**Heavy A (A)**	**Sign Risking (Fx)**	**Level Risking Beginning (Tr**		**Village Kinan (F)**	**Twill Ahan (A)**	**Sign Risking (Fx)**	**Level Risking Remainder (Tr**	

	ent / Public						**ans lati on)**						**ans lati on)**	
Installation Beam	• Disturbance Health Consequence Condition Work Generally General, • Accident Consequence • Past settings Cross Not enough Good, • Accident Consequence Strength Support Land Which Mushy Or NO Strong, • Accident Moment Will Mobilization Tool Consequence Road Which Narrow • Accident Consequence Wrong Procedure Pre Emphasize • Malfunction Tool Emphasize • Accident Consequence Tool Help Lift worn Or Convoluted • Accident Consequence	• Project All Staff In the Project • Visitors/ Visitors In the Project	• Law No. 1 1970 – K3 • PP Number 50 In 2012 – SMK3 • Candy Pu NO 10 Year Year 2021 About Vocational School • Minister of Manpower Regulation on Rans Ri. No. Per. 08/Pria/ Vii/2010 – Apd • Regulation of the Minister of Manpower Number 8 of 2020 Concerning Lifting and Transport Equipment • Regulation of the Minister of Manpo	5	5	25	Heavy	• Tools Still Available Condition Suitable With Letter Worthy Operation/Sia • Inspect Competence Operator With Sio • Inspect Condition Tool And Slings And Tools Help Lift When Before Mobilization In the With Inspect Maintenance Notes • Inspect Tool Pre Emphasize Beam • Inspect Certificate Tool Help Lift • Make Traffic Management Plan • Make Method Work,	2	3	6	Light	• Compaction Repeat And Test CBR (Print) Land • change Sling When Will It Be Installation • Make Method Installation Girder And Di Closed So that Can Which Agreed

Arrangement So Cross Not enough Good From Share Page Which Not enough Good, • Accident Consequence Placement Share Material Which NO • Right Girder Fall Consequence Tool/ Crane Which Malfunction • Tool Heavy Experience Problem On Sling • Tool Heavy Leaking Or Damaged Moment	wer Number 9 of 2016-Working at Heights			Risking Evaluation And Jsa And Socializing. • Inspect Condition Stack For Placement Share Page Beam • Add Plate Steel When Will Carry out Appointment Beam, • Hse Induction For All Strength Work Which Entering Diarrhea Work, • Installation Barricade & Signs • Toolbox Meeting & Inspection Routine. • Use Helmet, • Use Vest Security • Use Shoe Safety Shoes/Safety Boots	

Based on the results of the Author's observations, the Implementation Overview of the Hazard Identification Risk Assessment and Determining Control (HIRADC) Application in Girder Lifting Work at PT WIKA Gedung Tbk has complied with PUPR Regulation No. 10 of 2021 concerning Guidelines for the Construction Safety Management System (SMKK) Attachment 1 in point C.5 states that "documented information where all workers must have information related to work control in the form of procedures, work instructions, technical operating instructions, and others that are documented". The procedure is made by workers who are competent in their fields such as HSE, production and engineering who communicate regarding the work activities to be carried out, one of which is girder lifting and Attachment 1 point 2 Element 2 RKK, namely construction safety planning. Based on this, it can be said that the control efforts carried out have been effective because they can reduce the severity and also the level of possibility of potential hazards in *girder lifting work.*

According to Other Company References Implementation of Hazard Identification Risk Assessment and Determining Control (HIRADC) in Girde Lifting Work The risk identification stage is to find the risk variables that may occur in the girder work. The second stage is the risk assessment based on the final results of the risk identification to obtain the level of risk in the girder work. The third stage begins with the collection of project control action data based on existing risk identification. Risk control data is obtained based on applicable provisions/legislation based on the control hierarchy (elimination, substitution, engineering control, administration, and use of personal protective equipment). The risk control data that has been obtained is then entered into the HIRADC Table. Determination of further control actions will be carried out through direct interviews with the head/coordinator of the contractor's HSE division and the supervisory consultant.

CONCLUSION

From the results of the researcher's analysis, it can be concluded:

1. The implementation of the HIRADC Procedure for the girder lifting work on the PT WIKA Halim High-Speed Train Station Project is in accordance with the Regulation of the Minister of PUPR No. 10 of 2021 concerning the Construction Safety Management System (SMKK) as stated in No. Doc: WIKA-BG-PDSMM-IK-44 and Ref: 0440/DIR/KCIC/04/19, namely having a hazard identification program, risk assessment, and hazard control, all of which are listed in the HIRADC table which has an assessment and control that is in accordance with the girder lifting work activities and has a risk matrix calculation. However, in making the HIRADC program and documents, it should be more neatly arranged, so that workers can understand the HIRADC documents and supervise so that workers work according to procedures.
2. In the HIRADC on the Halim High-Speed Train Station Development Project, hazard identification, risk assessment, and hazard control have been carried out on the girder designation work. It is in accordance with PUPR Regulation No. 10 of 2021 concerning the Construction Safety Management System (SMKK) with a method of looking at the aspects of the hazards caused by workers, equipment, materials and the environment.

Then a risk matrix is conducted by calculating the multiplication between probability and severity and a risk level appears in the girder designation work that is at extreme risk and hazard control is carried out to clarify the units involved in making HIRADC so that they can effectively prevent work accidents.

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