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JL.Surya Kencana No.1 Pamulang, Tangerang Selatan – Banten
Telp. (021) 7412566, Fax (021) 7412491
Email : humanisproccedings@gmail.com

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Ergonomic Analysis Using Rapid Upper Limb Assessment (RULA) And Rapid Entire Body Assessment (REBA) Methods On Workers Posture In The Packaging Radiator Sector PT. XYZ Tbk

Zainal Abidin[1)]; and Sugiyanto[2)]

Universitas Pamulang, Banten, Indonesia

E-mail: [1)]zainal.abi1101@gmail.com
[2)]) dosen00495@unpam.ac.id

Abstract: PT. XYZ, Tbk is a manufacturing company engaged in the field of automotive components with products in the form of radiators. In line packaging, the activities carried out by workers sometimes still use manual activities such as carrying, lifting, taking, placing, pushing or pulling objects. This repetitive activity can endanger the health of the operator if done with the wrong posture. Seeing these conditions, it is necessary to repair work stations that can improve the working conditions of operators in the process of working, reducing discomfort. After being researched using RULA (Rapid Upper Limb Assessment), the work process with the highest RULA score is 6 (moderate risk) with a bending motion during steples doos and in the REBA (Rapid Entire Body Assessment) assessment the highest score is 9 (high risk) with bending motion at the time of steples doos. Therefore, in this study, the work station (conveyor packing) was repaired so that the conveyor height could be set to improve non-ergonomic movements in the radiator packing process and layout changes so that the operator was more efficient at work.

Keywords Ergonomics, Worker Risk Level, RULA, REBA

INTRODUCTION

The production line is not only a place of work for every operator or employee, but can also be said as a second home for workers. In this case the layout of the production line must be arranged neatly and comfortably so that employees can work effectively and efficiently.

In the industrial world at PT XYZ Tbk Line Packaging, the activities carried out by workers sometimes still use manual activities such as carrying, lifting, taking, putting, pushing or pulling objects. This repetitive activity can endanger the health of the operator if done with the wrong posture. This posture error can also result in complaints in the form of musculoskeletal injury or fatigue. Ergonomics as a science that designs work certainly does not escape the problems of occupational health and safety. Therefore, the application of ergonomics can be done in these cases. With the application of ergonomics, the risk of injury

to workers can be reduced, health costs due to wrong posture can be reduced, worker comfort can be increased, and of course worker productivity and performance will increase.

Based on the problems above, the authors are interested in researching "Ergonomic Analysis Using the Rapid Upper Limb Assessment (RULA) and Rapid entire Body Assessment (REBA) Methods on Worker Postures in the Packaging Radiator Division of PT. XYZ, Tbk.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Ergonomics

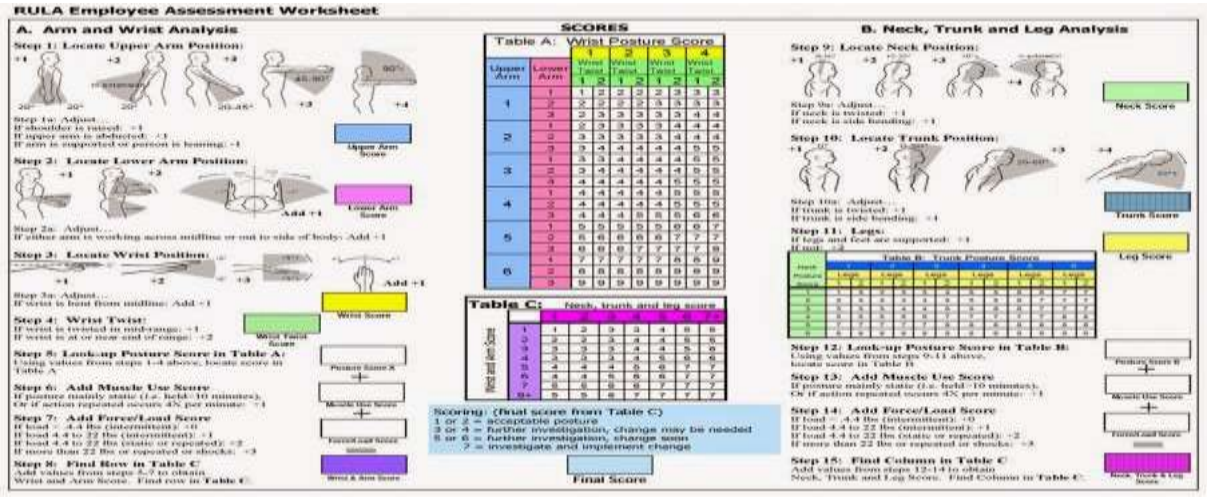
The definition of ergonomics in Sritomo Wignjosoebroto's book is Ergonomics or ergonomics actually comes from the Greek word Ergo which means work and Nomos which means law. Thus, ergonomics is intended as a scientific discipline that studies humans in relation to work.

Mira Rahayu (2015), the purpose of ergonomics is to increase labor productivity in an institution or organization. This is achieved when there is a match between the worker and his job. The ergonomics approach tries to achieve the good for both workers and institutional leaders. This can be achieved by taking into account the 4 main objectives of ergonomics, namely :

1. Maximizing employee efficiency
2. Improving work safety and welfare
3. Encouraging safe, comfortable, and enthusiastic work
4. Maximizing convincing work performance.

RULA (*Rapid Upper Limb Assessment*)

Rapid Upper Limb Assessment (RULA) is a method to assess posture, style and movement of a work activity related to the use of the upper limb (Upper Limb). This method was developed to investigate the risk of abnormalities that will be experienced by a worker in carrying out a work activity that utilizes the upper limbs.



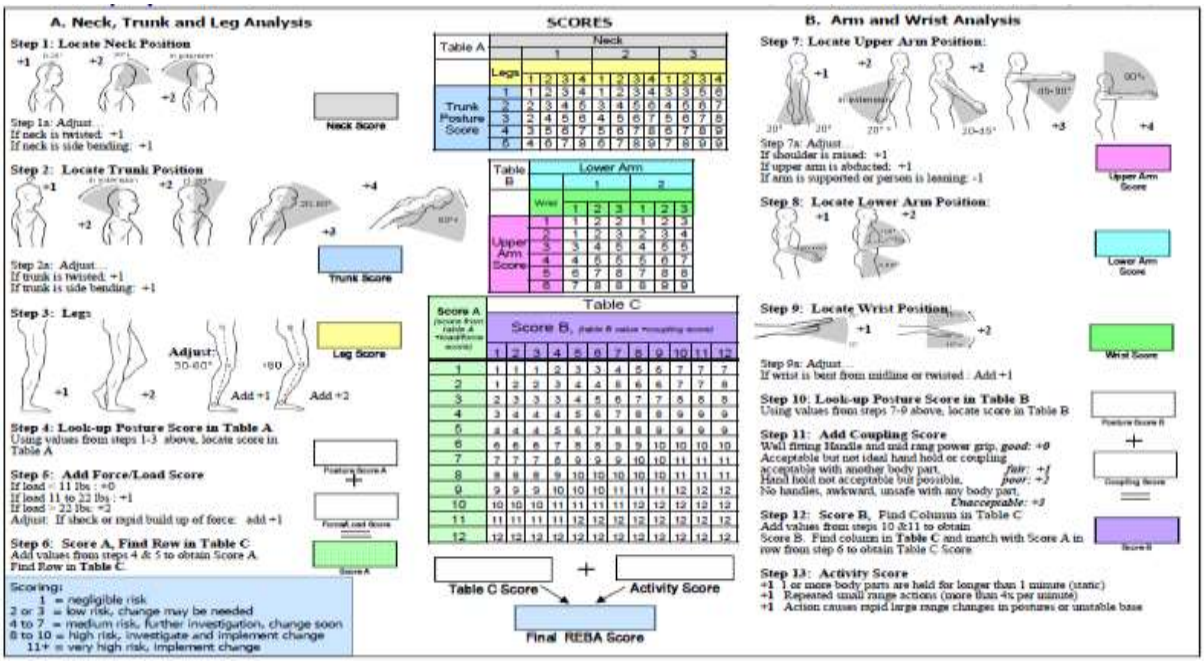
Source: Hignett and Mc. Atamney, 2000

Picture 1. Rula Worksheet

REBA (*Rapid Entire Body Assessment*)

Rapid Entire Body Assessment (REBA), (Hignett and Mc. Atamney, 2000), was developed to assess work posture in the health care industry. REBA is a posture analysis method that can be used quickly to assess work position. The area analyzed in the REBA method is the posture of the neck, back, arms, wrists and legs of an operator.

Rapid Entire Body Assessment (REBA), (Hignett and Mc. Atamney, 2000), was developed to assess work posture in the health care industry. REBA is a posture analysis method that can be used quickly to assess work position. The area analyzed in the REBA method is the posture of the neck, back, arms, wrists and legs of an operator.



Source: Hignett and Mc. Atamney, 2000

Picture 2. Reba Worksheet

METHODS

This research is a qualitative research with a case study approach on radiator packing workers related to body posture position to determine the level of ergonomic risk through an assessment of awkward postures (neck, spine and hips). This observation uses RULA and REBA measurements.

Based on how to obtain it, this study uses primary data and secondary data. Primary data is data collected by the researcher directly from the object under study and for the benefit of the study concerned which can be in the form of interviews and observations. Secondary data is data obtained/collected and put together by previous studies or published by various other agencies.

In this study, the authors took the object of research on the radiator packing operator in the Packaging production line 02. Data collection in this study used the following 4 methods, namely the description used, namely observation, interviews, and documentation

Metode Pengolahan dan Analisis Data

1. Calculation of Rapid Upper Limb Assessment (RULA)
2. Calculation of Rapid Entire Body Assessment (REBA)

RESULT AND DISCUSSION

Calculation of Rapid Upper Limb Assessment (RULA)

Based on the previous chapter, the results of measuring awkward postures using the RULA method are obtained from all work processes in the Packaging section which will be explained in table 1:

Tabel 1. Results of Total RULA Measurement Score

No	Process	Score Rula	Risk Level	Action
1	Steples 1	5	Medium Risk	Need improvement
2	Inserting the Radiator	6	Medium Risk	Need improvemen
3	Styrofoam installation	6	Medium Risk	Need improvemen
4	Steples 2	6	Medium Risk	Need improvemen
5	Placing the Radiator on the Pallet	6	Medium Risk	Need improvemen

Calculation of Rapid Entire Body Assessment (REBA)

Based on the previous chapter, the results of measuring awkward postures using the RULA method are obtained from all work processes in the Packaging section which will be explained in table 2 :

Tabel 2. Results of Total REBA Measurement Score

No	Proses	Skor Reba	Level Resiko	Tindakan
1	Steples 1	6	Medium Risk	Need improvement
2	Inserting the Radiator	8	High Risk	Need improvemen
3	Styrofoam installation	8	High Risk	Need improvemen
4	Steples 2	9	High Risk	Need improvemen
5	Placing the Radiator on the Pallet	8	High Risk	Need improvemen

CONCLUSIONS

The conclusions obtained from this research at PT. XYZ Tbk are as follows:

1. Based on the results of the analysis, the work posture of workers in the Packaging Radiator section has the highest score of 6 according to the RULA method, and the highest score of 9 according to the REBA method.
2. Conclusion with the RULA method: workers do work in a work position that can cause injury, and further evaluation is needed and a change in work posture may be needed.
3. Conclusion with the REBA method: workers do work in a work position that has a medium MSD risk level, and further evaluation is needed and changes in work posture are needed.
4. The more appropriate method used is the REBA method, because the worker is in a standing position so that it is more focused on analyzing the upper and lower parts of the worker's body.

The suggestions that can be given for this research at PT. XYZ Tbk, it is necessary to make changes to the Conveyor where the Radiator is packed, so that it can be set for the height of the conveyor by using Hydraulics and a change in the layout of the packing section of the workplace, so that operators are more efficient at work.

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