

## C516485 : MAJOR INDUSTRIAL ENGINEERING

KEY WORD: TOTAL ERGONOMIC APPROACH / ERGONOMICS / ELECTROMYOGRAPHY

ABHICHAJ SITAKALIN : ERGONOMIC PROBLEMS IN A HYGIENIC-PRODUCT

FACTORY USING A TOTAL ERGONOMIC APPROACH. THESIS ADVISOR :

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TAEPAVARAPRUK. 150 pp. ISBN 974-584-601-5

This research was aimed at 1) investigating muscular load of workers who perform a heavy work and a repetitive work, 2) comparing responses of EMG measurement and heart rate record on different works, 3) studying effects of work factors on muscles, and 4) proposing solutions to the problems by total ergonomic approach.

The research was conducted under real life conditions of a factory producing hygienic products in Lad-Krabang complex. Measurements of workspace dimensions and of workers anthropometry were collected. Interviews were done using standard interviewing forms to find abnormal index. Nine test subjects were selected as a result : five from repetitive work (sanitary napkin packing department), four from heavy work (two each from sack carrying work and hauling cart of sacks in and out of oven). Electromyogram (EMG) level of deltoid and trapezius muscles and heart rate were measured together with observation of work conditions. Force required to push cart of sacks in and out of oven was also measured.

It was found that the average EMG values of deltoid and trapezius muscles for heavy work were higher than 35 % of maximum value, which was considered dangerous. After suggestions to use lifting aid for sacks and to install anti-slip floor shoot, EMG values could be reduced. For sanitary-napkin packing, a repetitive work, it was found that EMG value was lower than that of heavy work. However, when comparing EMG value for sanitary-napkin packing for the beginning of the week against the end of the week, it was found that packing work had caused fatigue accumulation. Job rotation was proposed as solution to fatigue accumulation problem. As for relationship study between EMG and heart rate, no relationship was found.

From this study, it could be concluded that factors affecting muscular activity are 1) type of work, 2) work shift (beginning-end of week), and 3) work environment.