

NIVIT CHAROENCHAI : ERGONOMIC DESIGN OF SITTING POSTURE FOR PIPE WELDING. THESIS ADVISOR : ASSO. PROF. KITTI INTARANONT, Ph.D., 181 PP. ISBN 974-579-640-9

The objectives of this thesis were 1) to measure, collect and analyze the anthropometric data of the pipe welding workers, 2) to study working conditions and problems of the pipe welding workers who work under static load, 3) to study biomechanical load of the workers during work and design a new work station and appropriate sitting posture and 4) to study the discomfort of the workers from working in the existing work station and compare with the proposed design.

Four subjects were used in this study. It was found that the deterioration of static strength of back, arm, shoulder and grips were in the range of 1.3 to 18.8% of MVC (Maximum Voluntary Contraction) for working 6 days a week and the subjects were fully recovered after a Sunday rest. From the simulation of sitting postures of the pipe welding workers, the electromyograph of trapezius, deltoid and erector spinae muscle were in the range of 1 to 3% of MVC. For subject number 2, the electromyograph of deltoid muscle reached 18% of MVC due to the different sitting posture. From the biomechanical analysis, it was found that the compressive force acting on lumbar 3 intervertebral disk were in the range of 51 to 72 kg. In this study, a new sitting posture for pipe welding was designed to reduce lumbar load. It was also found that the discomfort level increased throughout the working day. Though the discomfort levels of each subject were different, the increases in the feeling of discomfort were approximately the same.