Ergonomics and Anthropometry Considerations in Design of Workstation

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Abstract

Ergonomics is the science and technology of fitting the activities and environment to the abilities, dimensions, and needs of people to improve performance while enhancing comfort, health and safety. Anthropometry is the branch of ergonomics that deals with body shape and size. Workstations in small scale industries are designed in an arbitrary manner, and no consideration is given to the anthropometric measurements of the operator. The present study is designed to focus on mismatch between operator measurements and physical characteristics and work station design to find out any mismatch between them. Some case studies of workstations in typical small-scale industries like food products, grinding mills, garment industry and bolt manufacturing units are taken for study. The workstations are studied to find out ergonomic deficiencies and mismatch between the user and workstation design. Rapid Upper Limb Analysis (RULA) is done on the awkward posture adapted by operators while doing work. The ergonomic deficiencies are highlighted and the improved workstations are designed and built in CATIA software. RULA analysis is carried out on the improved workstation using human manikin built in CATIA. The results show the RULA risk levels are considerably reduced (from high-risk category to medium or low risk category). It can be concluded from the present studies that small scale industries lack awareness and application of ergonomics and anthropometry principles in the design of work stations, thus compelling the operators to work in difficult postures, poorly designed workplaces and work environment.

Keywords
Ergonomics, Anthropometry, RULA, CATIA and Workstation.

Biography

Dr. Qutubuddin S.M. is presently working as Associate Professor, Industrial and Production Engineering Department, P.D.A. College of Engineering, Gulbarga. He has more than 30 years' experience in teaching and research and has published more than 35 papers in International and National journals and Conferences. He has introduced the course Human Factors and Ergonomics in the curriculum in under graduate engineering and has developed laboratories such as Industrial Engineering Laboratory and Ergonomics Laboratory. He is a life member of professional societies such as ISTE, IIPE, IAENG, and ISE. He is a regular member of various committees' of IEOM Society conferences and continuously involved in promoting the activities of IEOM Society. He has established a IEOM Society student Chapter at PDA College of Engineering. Research interest include Industrial Ergonomics; Human Factors; Occupational Health and Safety; Productivity Improvement Studies; Production/Operations Management; Environmental Ergonomics. Currently he is Director, IEOM Operations in India.