SNS COLLEGE OF TECHNOLOGY

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Coimbatore – 35

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DEPARTMENT OF AGRICULTURE ENGINEERING

19AGE307 – ERGONOMICS OF FARM MACHINERY AND IMPLEMENTS

III – YEAR VI SEMESTER

UNIT 1 – INTRODUCTION

TOPIC – ASSESSMENT OF WORKLOAD

Mental Workload

- The mental stress and strain of being busy at work
- Excessive ‘mental workload’ often leads to errors
- Mental Workload’ is important in the operation of Safety critical systems

Examples of ‘Mental’ Tasks

- Vigilance
- Problem recognition and diagnosis
- Planning and action
- Prioritisation
- Remembering to do things
- Rapid integration
- Coping with the unexpected

FACTORS THAT IMPACT UPON OPERATOR 'MENTAL WORKLOAD'?

- Skill levels
- Operating rules and procedures
- Operating conditions
- Staffing levels
- Task allocation
- Organisational expectations

Assessment of Workload

- Here are key aspects and techniques for assessing workload:

1. Subjective Measures:

- Rating of Perceived Exertion (RPE):

RPE is a subjective assessment where individuals rate their perceived level of physical or mental effort on a numerical or descriptive scale. The Borg Rating of Perceived Exertion (RPE) scale is commonly used in ergonomic assessments.

- Subjective Workload Assessment Techniques (NASA-TLX, SWAT):

Various subjective workload assessment techniques involve self-reporting on different dimensions of workload, such as mental demand, physical demand, temporal demand, effort, frustration, and performance. Examples include the NASA Task Load Index (NASA-TLX) and the Subjective Workload Assessment Technique (SWAT).

Assessment of Workload

2. Physiological Measures:

➢ Heart Rate Monitoring:

Monitoring heart rate provides an indication of the physiological stress associated with different work tasks. Deviations from baseline heart rate can signal increased workload.

➢ Oxygen Consumption (VO2) and Metabolic Measurements:

Indirect calorimetry measures oxygen consumption and carbon dioxide production, providing insights into the energy demands associated with work tasks. This helps in understanding metabolic workload.

Assessment of Workload

3. Performance Measures:

➢ Task Performance Metrics:

Assessing task completion times, error rates, and accuracy provides information on the cognitive workload associated with specific job tasks. Changes in performance metrics may indicate changes in workload.

4. Cognitive Measures:

➢ Cognitive Workload Assessment Tools:

Various tools and assessments are available to evaluate cognitive workload. This includes measures of mental workload, information processing demands, and attentional requirements.

Assessment of Workload

5. Biomechanical Measures:

- Muscle Activity (EMG):

Electromyography (EMG) measures muscle activity and can help assess the physical demands of tasks. High levels of muscle activity over an extended period may indicate increased physical workload.

- Postural Analysis:

Evaluating body postures during work tasks helps identify ergonomic stressors. Poor postures or prolonged static positions can contribute to physical workload

Assessment of Workload

6. Work-Rest Schedules:

➢ Balancing Work and Rest:

Assessing workload involves considering the balance between work demands and the need for rest breaks. Proper work-rest schedules help prevent fatigue and maintain worker well-being.

7. Workload Modeling:

➢ Task Load Index (TLX):

TLX is a widely used workload assessment model that considers multiple dimensions, including mental demand, physical demand, temporal demand, performance, effort, and frustration. It involves subjective ratings on each dimension.


Thank You!