Guideline for Ergonomics Assessment & Evaluation

(STQC/BDCS/P13)

Issue: 01

Biometric Device Certification Scheme (BDCS)
STQC Directorate,
Ministry of Electronics & Information Technology (MeitY)
Government of India

Contents

0.1.Approval and Issue

Reviewed by : Management Representative

Approved by : Head, BDCS

Note:

- Management Representative is responsible for issue and distribution of this document including amendments.
- Holder of this copy is responsible for incorporation of all the amendments and currency of the document.

0.2.Amendment Record

Sl. No.	Date	Issue	Rev.	Reason of Change /Change Details
1.	04-01-2021	1	0	First Issue

1. Reference Documents

STQC/BDCS/D01	:	Rules and Procedures
STQC/BDCS/D08	:	Specifications
STQC/ BDCS/P10	:	Procedure for obtaining Biometric Device Certification-Authentication/Enrolment
STQC/ BDCS/P11	:	Procedure for Test, Evaluation and Certification of QR Code Scanner
STQC/BDCS/F09	:	Ergonomics Assessment & Evaluation Format
ISO/IEC 17025	:	General Requirements for the Competence of Testing and Calibration Laboratories.

2. Ergonomics - Overview

In very simple way Ergonomics is a way to work smarter by designing tools, equipment, work stations and tasks to fit the job to the worker, which is balancing job characteristics with human capabilities.

Ergonomics is a systems-oriented discipline which now extends across all aspects of human activity. When practically applied, ergonomics seeks to optimize the functioning of systems by ensuring that they are compatible with human capabilities and needs.

The application of Ergonomics to job design, results on employers reduced absenteeism, increase productivity, and decreased costs for injured workers, improved union/management relations, improved morale of employees with a greater satisfaction and less stress.

The official definition of Ergonomics, by the International Ergonomics Association in 2000 was: “Ergonomics (or human factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, it is also the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance” (IEA, 2001).

So Ergonomics contribute to the design and evaluation of tasks, jobs, products, environments and systems in order to make them compatible with the needs, abilities and limitations of people. Ergonomics is defined as the design of the workplace, equipment, machine, tool, product, environment and system, taking into consideration a human being's:

- Physical,

- Physiological,
- Biomedical and
- Psychological capabilities

In other words, "fit the job to the person" rather than "fitting the person to the job." Ergonomics means designing the work environment and specific job tasks to fit the worker's need for comfort, health and safety.

Key Factors ergonomic analysis methodology provides practical solutions to ergonomic hazards encountered in a myriad of working conditions where cumulative trauma disorders (CTDs)/ repetitive strain injuries (RSIs), cognitive workload, or other ergonomic concerns are present.

3. What Is an Ergonomic Assessment & Evaluation?

An ergonomic assessment & evaluation uses the science of ergonomics to determine the physical relationship of the worker to his or her work station. The purpose of the evaluation is to increase workplace comfort and productivity as well as prevent repetitive strain injuries. Every individual has different ergonomic needs and so should align his or her work station with those needs.

Many work environments require repetitive movement or remaining in one position for long periods of time. Often, these positions or movements are not the way human muscles and joints are supposed to function. Over time, the continuous strain can cause serious injury and even disability. An ergonomic evaluation can detect what adjustments should be made in order to prevent injury. Injury prevention also means worker compensation savings to the employer. Not only can ignorance about ergonomics lead to injury, but it can also drain the body of energy and cause discomfort. When the body is working in an uncomfortable position, even mild symptoms can cause distraction from the work at hand. The person's focus will likely keep shifting back to his or her discomfort. An ergonomic evaluation can show how to get more work done with the body and mind in harmony.

Common tools used during an ergonomics assessment & evaluation include an ergonomic checklist. Desk design, height, and organization are assessed during an office ergonomic evaluation. Chair adjustment as well as working posture is considered. The computer monitor's position and angle in relation to the employee's eye-line are observed. Keyboard and mouse position and the elevation of the wrist when using these tools are also noted during evaluation. Finally, the overall posture is assessed to eliminate strain so the joints are comfortably and naturally aligned.

Ergonomic evaluation can also help rule out the work environment as a cause for symptoms. A proper assessment will look for other possibilities for the symptoms if it isn't obvious that the problem is ergonomics related. For example, if a person is suffering shoulder pain that is constant

and the work station doesn't appear to be problematic, the symptoms may be primarily caused by a hobby or even sleeping habits.

4. Ergonomic Assessment & Evaluation: Guidelines & Checklist

4.1. Introduction:

Ergonomics is a scientific discipline, which is concerned with improving the productivity, health, safety and comfort of people, as well as promoting effective interaction among people, technology and the environment in which both must operate.

4.2. Purpose:

Ergonomic device should be designed to facilitate task performance, minimize fatigue and injury by fitting equipment to the body size, strength and range of motion of the user.
The device should be task specific to eliminate:

a) Static or awkward posture,
b) Repetitive motion,
c) Poor access or inadequate clearance and excessive reach,
d) Display that are difficult to read and understand, and
e) Controls that are confusing to operate or require too much force.

Therefore, the device should be suitable for the types of tasks performed and be adaptable to multi-purpose use. Device must be designed carefully to meet the need of the staff and to accomplish the goals of the facility.

4.3. Objectives:

Design objectives should support humans to achieve the operational objectives for which they are responsible. There are three goals to consider in human-centered design.

1. Enhance human abilities
2. Overcome human limitations
3. Foster user acceptance

4.4. Scope:

a) Biometric Device (Iris Authentication), OR
b) QR Code Scanner Device (for e-Aadhaar / Aadhaar letter)

4.5. Context of Use:

- Use of biometric device by the **device operator** for **user** authentication, OR
- Use of QR code device by the **device operator** for **E-aadhaar/ Aadhaar letter QR code Capture**.

4.6. Process:

The ergonomics assessment & evaluation will be based on 5-key characteristics:

- Ease of use/ Operability
- Comfort
- Safety / Health
- Effectiveness
- Efficiency/ Productivity

Each of these key characteristics is further expanded into related checkpoints – resulting in an Ergonomics Assessment & Evaluation Checklist. Refer Form STQC/BDCS/F09.

The Ergonomics Assessment & Evaluation Checklist will be filled by a group of users/ tester (minimum 10). Each checkpoint will be responded with either (Yes/ No/ / NA) along with comments, if any.

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