

## PSYCHO TECHNICAL DIRECTORATE

### Test Facilities:

The directorate has Psycho-Technical and Ergonomics laboratory equipped with testing facilities for testing critical safety and efficiency attributes through man-machine interface. The Laboratory has various equipments for assessment of psycho-motor abilities and skills through computerized testing.

### Computer Aided Drivers Aptitude Test (CADAT):

These computerized tests are administered to measure specific abilities related to the nature of job of the Loco Pilots for their screening prior to their deployment on High Speed Trains, such as Reaction Time, Form Perception, Vigilance, Speed anticipation and some selected attributes of personality. Testing process and evaluation of results are automatic and the results get generated immediately after the testing is over.

CADAT includes the tests to measure the following attributes-

1. Depth Perception
2. Speed perception
3. Form Perception
4. Distribution of Attention
5. Visual Differentiating Attention
6. Diagnostic Attention
7. Visual Vigilance
8. Simple Reaction Time
9. Complex Reaction Time
10. Personality
11. Continuous Addition
12. Rail Sign
13. Clock
14. Multi Modal
15. Embedded Figure
16. Group Bourdon
17. Mechanical Comprehension



### Digital Speed Anticipation Reaction Tester

**Description** The apparatus consists of a stimulus screen and control elements with a reaction lamp. It is used to study human movement perception, specially speed and time perception in a wide range of research modes.



**Manufacturer** M/s. Takei & Company, Japan

**Measure** This test gives an objective assessment of fundamental subliminal aptitude necessary for ensuring safety.

**Present use** The test is used in research only.

## Multi-operational Apparatus for Reaction- Time

**Description** The device consists of a main panel with an optional Psym Con Interface having button and display panel for the main panel. It is used for the study of cognitive processing and for organizing wide range of experiments involving reaction time, reaction/movement time.



**Manufacturer** M/s. Lafayette Instruments, USA

**Measure** It measures reaction time through touch sensitive response keys.

**Present use** The test is used for measuring the reaction time of loco pilots for validating it against the test of complex reaction time of CADAT battery for high speed loco pilots.

## Pullman Spiral Acquisition and Analysis system

**Description** The system comes with a grip pen and USB tablet that needs to be connected to a computer to acquire spirals drawn on the tablet.



**Manufacturer** M/s. Lafayette Instruments, USA

**Measure** The equipment is used for study of normal motor control and detecting movement disorders such as Parkinson's disease and tremor disorder or dystonia.

**Present use** On the basis of parameters, it is possible to diagnose presence of motor disorders in a subject without going through elaborate clinical examination. Such diagnosis is of critical importance for operating staff, especially High Speed Train Drivers in higher age-groups. So far data on 12 high speed loco pilots has been collected for ascertaining the presence or absence of any motor disorder.

## Diagnostic tests

The laboratory also has projective and psycho-metric tests used in clinical appraisal and counselling of staff especially those involved in accidents or showing signs of acute stress. These tests include Thematic Apperception Test (TAT), Rorschach, Colour Pyramid Test, Alexander Pass Along Test, Block Design Test, MMPI, etc.

Rorschach is a psychological test in which an individual's perceptions of inkblots are recorded and then analyzed using psychological interpretation, complex scientifically derived algorithms, or both. It is mainly used in case studies of Drivers and ASMs involved in accident to detect their personality characteristics and emotional functioning or an underlying thought disorder leading to the mishap.

The Ergonomics Laboratory was established in 1994. The mission of the Ergonomics Laboratory is to conduct research in the areas of occupational biomechanics, occupational safety and cognitive ergonomics. The Laboratory has the facility of measurement and control of stress with the aid of biofeedback equipment.



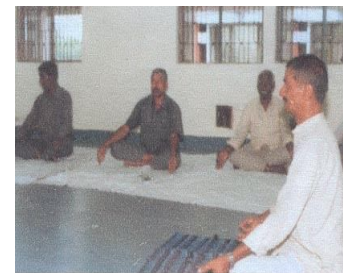
### Advanced Biofeedback system

Biofeedback is a well established technique for management of stress and stress related psychosomatic disorders. It provides a sleek wireless module for capturing readings on physiological parameters, which are recognised as pointers of stress, viz., Skin conductance, Pulse rate and amplitude, Temperature and Breathing pattern.



### Stress Management Programme:

Yoga and Meditation practices are helpful in stress management and are effective ways of relaxation. Experiments on controlling alcoholism and de addiction through yoga have also been successful.



### Workshops on Motivation and Stress Management:

Workshops on Motivation and Stress Management have been conducted for the benefit of Railway employees with a purpose to make them aware of the causative factors of stress, resulting impact on work/behavior and the various techniques to control the stress. Session on Psychology of adjustment, Psychotherapy, alternate therapies like Reiki, Acupressure, Pranik healing, Yoga and Pranayam and also Energy Healing techniques are taken up for the purpose.

### Other Facilities

Apart from serving the requirements of Indian Railways, the Directorate has also been rendering services to Public Sector Undertakings viz., the Konkan Railway Corporation, Delhi Metro Rail Corporation, DAME, Rapid Metro, Gurgaon, MOOPL, Mumbai, Chennai Metro etc.