

Case Study

Control Room at Mine Site

Background:

The Control Room is the hub of the mine site. The operators work 12 hour shifts and are the central contact point for the movement of personnel and materials underground. Operational information is collected and passed to the next shift. Information is passed to them through written notes and verbally via telephone, radio and face to face communication. Electronic and computer based monitoring of many underground operational aspects report to the Control Room computers. The Control room operators monitor this activity on five computer screens and initiate response to alarms.

The workspace is set up in a “U” shape consisting of five computer monitors, telephone and radio facilities and the paperwork required to be completed by the operator. Four screens monitored various aspects of the operation, the fifth belonging to the PC used by the operator for data entry, emails etc. The operator’s workspace could be described as three distinct but overlapping spaces in the “U” shape. The operator rolls the chair between these three stations, which causes the operator to forward lean and over reach to minimise the amount of rolling around of the chair.

The chair is shared by all operators, and is in use 24 hours a day 7 days a week. The chair is in a dilapidated state. The base or seat of the chair is 7-8cm lower on the right hand side causing the operator to adopt a side ways

flexion of the spine to sit upright. The left side arm is also broken and the back reclined at such an angle that the operators were not observed to use the chair back for support but sat leaning forward whilst working. This is most evident when using the radio facility as filing cabinets were stored under the desk in this location eliminating any legroom under the table forcing operator to extend forwards to use the radio.

Four monitors were 17" flat LCD screens. One screen consists of a VDU unit mounted on the wall. This display is a monochrome view of video cameras located on the surface and underground. The display rotated between cameras and shows four camera views simultaneously.

One LCD screen is dedicated to monitoring the underground telephone system and was used only to indicate what phones were in use.

Two screens monitor the status of underground equipment installations.

Each monitoring point has a set alarm level and when in alarm would flash on the screen. There are many factors monitored and each is displayed in alphanumeric text on the main screen. The screen is very busy. Many alarms occur each shift and no distinction is made between 'critical' alarms and general alarms that require no specific action from the control room operator. The alarm log shows pages of alarm history for the shift with only a small number of these alarms actually requiring an action from the operator to correct the situation.

These screens are located against the external windows and operators complain of feeling 'blind' at the end of day shift. Operators have requested sunglasses to work in the control room.



Photo 1

The workstation design has the operator sitting in front of a West facing window with monitors to their right and left sides. This can be seen in Photo 1 with the operator position marked by the telephones and paperwork. The primary work surface is 2.8m wide with two distinct computer work stations at opposite corners. The operator rolls the chair back and forth between the two.



Photo 2

Questions

1. Using this description, identify the key ergonomic hazards, and list any others you may suspect could be an issue
2. Determine which ergonomic assessment strategies/tools/measurements you would use to determine the risks
3. Make recommendations to improve the ergonomics of this work process

Model Recommendations

The proposed solutions to include:

1. Undertake a detailed task analysis to determine critical and frequent tasks.
2. Use data to inform appropriate design of workstation.
3. Account for environmental consideration of sunlight, glare and reflection.
4. Workplace Layout principles to be identified.
5. Recommendations for working heights, positioning of monitors, etc
6. Appropriate chair recommendations
7. Recommendations concerning cognitive demands.
8. Recommendations concerning computer screen information, including colour of alphanumeric symbols.