There are many work schedules that are called shift work. Shift work involves working outside the normal daylight hours. Shift workers might work in the evening, in the middle of the night, overtime or extra-long workdays. They also might work regular days at one time or another. Many shift workers “rotate” around the clock, which involves changing work times from day to evening or day to night. Demanding work schedules are a fact of life in modern, 24-hour society. Goods are produced and services are provided all hours of the day and night. This call for people to work odd hours and such work schedules are called shift work. The body has a 24 hour “biological clock” known as circadian rhythm that tells it when to sleep and when to wake up. Sunlight and darkness regulates this clock. Working shifts can affect a worker’s health and safety. Shift work can have many physiological, psychological and social effects on a person. Railway is an important industry where large numbers of human resources are involved in rotational task. The purpose of combining human factor with railway industry workers is to reduce occupational health hazards of the workers. The present study was carried out to assess the physiological and psychological cost of work. The descriptive data was collected with the help of interview schedule through interview method. The experimental data was gathered for different physiological test (blood pressure, heart rate, body temperature) and psychological parameters (letter cancellation, fatigue severity scale). The result reveals that significant difference in physiological parameters i.e. blood pressure, heart rate and psychological test letter cancellation test of the respondents denoting their stress and fatigue due to rotational job demand. As a part of action research a manual and CD entitled Shift Workers Guide for shift workers was prepared. This suggests different guidelines to the individual and organization as how to cope better to the job demand. This would then enhance job satisfaction, health status and lifestyle of the employees at domestic level as well as official front.

INTRODUCTION

At the same time as many urban economies are developing into 24-hour societies it is becoming increasingly popular amongst shift workers to compress their working hours by extending shifts and/or decreasing time for recovery between shifts (1,2). The move to 24 hours, 7 days (continuous) operations across industries is also increasing the pressure for work outside daytime hours. This trend has been accompanied by pressure from employers to eliminate traditional penalty rates for night work, overtime and weekend works impact, to treat all hours the same and pay for the work that is done, not when it is done. Some people are engaged in shift work with extended hours by choice, but for many it is a matter of economic necessity. In industries where remuneration is low but paid overtime is available, or where income is based on piecework, employees work long hours in order to earn an ‘adequate’ income. In other industries with ‘annualized salaries’, unspoken expectations or excessive performance monitoring results in employees spending extra unpaid hours at work. In all industries, job insecurity is a significant factor in the extent of excessive hours worked. The term “shift work” means different things to different people. Shift work is popularly regarded as work in which employees "shift" schedules on some regular basis from daytime to evening or nighttime. According to the International Labour Office, shift work is defined as, ‘A method of work organization under which groups or crews of workers succeed each other at the same workstations to perform the same operations, each crew working a certain schedule or shift so that the undertaking can operate longer than the stipulated weekly hours for any worker. Often the term is used when more than one work period is scheduled in a workday or when most of the working hours fall outside the standard work-day, such as evening, night or weekend shifts’. Employees’ lives beyond work can be greatly influenced by rosterers. The more shift work (particularly night work) and extended working hours that people are exposed to per day, per week and so on, the greater the effect on the quality of off-duty periods. To survive and remain healthy, the human body has to keep a balance between different processes within the organism (3,4). This regulation involves many systems that interact on various levels (5,6), and we have evolved intricate processes to keep the different systems within certain boundaries. These are so called, “homeostatic systems” (homeostasis referring to “balance” or steady state) are vital and allows the individual to retain a physiological and behavioral stability despite environmental fluctuations (7).

Rotating shift work has well-known harmful effects on human health and well-being. It disturbs sleep, wakefulness, eating patterns, social life and in the long run, often results in gastrointestinal diseases. However, studying health problems in workers is difficult. If possible, workers will change jobs if they think the work is making them ill. A shift worker might change to a day job for that reason. This is called the “healthy worker” or the “survivor” effect. Workers who stay on the job are those who can “take it.” Because sick workers leave the job, it is much harder to show a relationship between job factors and poor health. According to (8), desynchronization of circadian system affects the mental and physical health, longevity of the worker as well as public safety.
Seventy hours sleep deprivation does not obliterate circadian rhythms. However, while parameters of physiological rhythms (e.g. adrenaline, body temperature) remained unchanged, there was a trend of decrease in performance (logical reasoning, calculation tests) and increase in self-rated fatigue and sleepiness. Reduced or disrupted sleep results in increased sleepiness and reduced well-being of the following day. Female shift workers have been reported to experience more sleep disturbances than men. They suffer from drowsiness more frequently during work.

Fatigue is a tiredness that results from physical and/or mental exertion. The level of fatigue experienced will depend on the workload imposed by a job, the length of shift, previous hours and days worked, and the time of day or night. Monotonous work or work where a high level of attention and alertness is required can also increase fatigue. Use of drugs such as caffeine or amphetamines by workers trying to overcome the effects of fatigue, and/or alcohol or sleeping pills to try to get to sleep, is a hazard of shift work. Any benefits are short-term, while the long-term effects on health and safety can be dangerous. Digestive problems could be more common in shift workers because digestion follows a circadian rhythm. Usually people eat at regular times during the day. They also eliminate waste at regular times during the day.

Shift work can interfere with regular eating and digestive patterns by changing work and sleep times frequently. So, it is not surprising that this could lead to nausea and other stomach problems. However, digestive problems could also be caused by lack of nutritious food. For example, sometimes on night shift only junk food from vending machines is available.

Heart problems also have been noted more often among shift workers than day workers. A higher risk of cardiovascular disease among shift workers compared to day workers has been demonstrated. Work schedule stress might cause heart disease, but it is more likely to be a combination of stress, poor diet, smoking and drinking habits, other life stresses, and family history of heart disease.

A shift work schedule affects not only the worker but also the rest of the family. Shift workers usually have less time to spend with their family and friends. They are often at work when regular social activities are scheduled and at home when others are at work. Therefore, shift workers may spend less of their time in social or recreational activities. Fatigue may also prevent shift workers from enjoying those recreational and social activities that they are able to participate in. This may be particularly true for parents who have family duties after work. Parents, particularly single parents, may also have more trouble with night shifts.

The purpose of combining ergonomics with railway industry worker is to reduce occupational health hazards of the workers. Railway is an important industry where large numbers of human resources are involved in rotational task. A number of studies have demonstrated that Shift work/Rotational work disrupts the body’s circadian rhythms, that is, its daily cycle. It also affects the quality and quantity of sleep a person gets and disrupts family and social life. This impact on the health of the shift worker can potentially cause tiredness, mental stress, cardiovascular diseases, gastrointestinal disorders, menstrual disorders, poor performance and increased accidents. Quite a good number of studies have been conducted abroad on different areas of rotational work. But there is very little information available in the literature on rotational task in the railway industry in India. Therefore there is need to study the type of activities performed by the railways workers in the 24 hours of the day, to suggest remedial guidelines and management strategies to improve their work efficiency. Considering the above facts, the investigation was planned with the following objectives:

1. To assess the physical health status of rotational workers.
2. To find physiological and psychological effect of work.
3. To suggest possible guidelines to reduce the work load and increase work efficiency of the rotational workers.

MATERIAL AND METHOD

Experimental and descriptive research design was planned in order to achieve the objectives of the study. The study was conducted at northern railway headquarter (Gorakhpur) in the year 2010 on a total sample size of forty (40). The sample was forty selected on random sample basis. Under descriptive research design pre-coded interview schedule was used for the present study for collection of data related to shift work pattern and health related problems. Beside general information specific information was collected by framing statements on health related problems (Table 1) & collecting data pertaining to various physiological variable viz. heart rate, blood pressure, pulse pressure, and body temperature (Fig 1) and the readings were noted on a morning evening basis.

For collection of experimental data various Psychological tests were performed to ascertain effects of stress and fatigue on a morning evening basis. The different methods used to measure the physiological parameters and psychological capacities of respondents are mentioned here under:

**Physiological test**

**Blood Pressure:** It was recorded with the help of sphygmomanometer through measurement of systolic and diastolic pressure. The average blood pressure was then calculated for the respondents of the experimental group. Blood pressure was recorded twice that is at the start and at the end of the respective shift schedule. 

**Average mean pressure = Diastolic pressure + 1/3rd of pulse pressure**
**Pulse Pressure:** The pulse pressure is nothing but the difference of systolic and diastolic pressure. It was calculated with the help of following formula:

\[
\text{Pulse pressure} = \text{Systolic pressure} - \text{Diastolic pressure}
\]

**Heart Rate:** It was measured with the help of polar heart rate monitor. Five readings at an interval of 1 minute each were recorded and the average of all the five readings of the heart rate was calculated to get the average heart rate at a time. Heart rate was measured before and after the shift immediately.

\[
\text{Average heart rate} = \frac{\text{sum of all the five reading (1st+2nd+3rd+4th+5th)}}{5}
\]

The change in the heart rate from morning to evening was calculated by the following formula:

\[
\text{Change in heart rate} = \text{Avg. HR in the morning} - \text{Avg. HR in the evening}
\]

**Temperature:** The body temperature of the respondent was recorded with the help of digital thermometer. Before recording the temperature it was made sure that the respondent does not eat anything at least 15 min. before the recordings. Temperature was recorded twice that is at the start and at the end of the respective shift schedule. The difference in the temperature from morning to evening was calculated by the following formula:

\[
\text{Change in Temperature} = \text{Temperature in the morning} - \text{Temperature in the evening}
\]

**Psychological test**

Fatigue Severity Scale (FSS): The Fatigue Severity Scale (FSS) is a method of evaluating the impact of fatigue. The scoring was done on the basis of the total scores of the person. If the total score was less than 36 then it suggests that they may not be suffering from fatigue. A total score of 36 or more suggests that they may suffer from fatigue.

Letter Cancellation Test (LCT): Letter Cancellation Test comprises of a random block of letters (alphabets or numerals) in which a target letter has to be located and cancelled. About 2000-3000 letters will presented and specified (target) letter will be cancelled wherever and whenever it occurs, within a given time frame (usually 2.0 minutes). The scores were computed with the help of following formula:

Total number of target alphabets cancelled by respondents Total Scores =Total number of all the alphabets in the block

**RESULTS**

Shift work exerts major influence on the physiological & psychological functions of the human body. Shift work can interfere with regular eating and digestive patterns by changing work and sleep times frequently. So, it is not surprising that this could lead to nausea and other stomach problems. These are primarily mediated by the disruption of circadian rhythms since most body functions are circadian rhythmic. Night shift is responsible for imbalance in the biological rhythm of the human being thus adding to tiredness in the body. Similar results have been reported by Monk (8) that resynchronization of circadian system affects the mental and physical health, longevity of the worker as well as public safety.

**Health related problem of shift workers**

Responses related to health aspect of the respondents depict that approximately twenty seven point five percent of the total male respondents & least number of female reported that that their appetite almost never disturbed during the working period. One fourth of the total male and female said that their appetite was quite seldom disturbed and few reported that their appetite was quite often/always almost always disturbed during work period. Approximately half of the total respondents, male and female reported that they almost never felt nausea between their shifts systems and only two point five percent males & females felt quite seldom nausea during their shifts systems if there was too much suffocation or more pressure at work.

Forty five percent males and seventeen percent female responded that they almost never suffered from stomach problem and seven percent male and seventeen percent female respondents quite seldom had any such problems whereas seven percent males, five percent females quite often suffered from their stomach-ache. The results are line with the authors (14) regarding health disorders of shift workers. He indicated that circadian rhythms for an association with peptic ulcer disease, coronary heart disease. Thirty percent male and female respondents quite seldom suffered from digestion difficulties whereas twenty three percent male and ten percent female respondents quite often and only seven point five percent male almost always suffered from digestion difficulties. Similar results reveals that gastrointestinal complaints of gastric upset, gas, constipation, poor eating etc. are strongly correlated with shift work (15). Another study was give strong link with gastrointestinal disorders being more common in shift workers than in day workers (16).

Data pertaining to constipation problems amongst sample population reveals that fifteen percent male and twenty percent female quite often suffer from this problem followed by eighteen percent male and eight percent female respondent almost always suffer from constipation. Less than one fourth respondents of the total quite seldom suffer from this problem.

Sixty percent male and thirty seven percent female respondents were of opinion that they almost never suffered from aches and pains in their chest. Only one female responded that they felt quite seldom ache in her chest.

Forty five percent males and fifteen percent female respondents gave positive response to suffering from shortness of breath when climbing the stairs normally and fifteen percent male and twenty percent female quite seldom suffered from shortness of breath whereas five percent female respondents quite often suffered from shortness of breath when climbing the stairs normally. High blood pressure as an indicator of health related problem was reported by one fourth of the total respondents. Whereas thirty point five percent male and forty five percent female respondents had almost never suffered from high
blood pressure. Shift workers have a 40% excess risk for CVD compared with day workers (14). An irregular eating habit is one of the major reasons responsible for gain in weight amongst rotational workers (17). More than fifty percent of the total respondents, male as well as female have put on weight since beginning of shift work. Less than one fourth felt that they have not gained weight since beginning of job. Similar results have been reported by the author (18).

Sixty percent males and eleven percent female felt that they had not lost weight since beginning shift work and only ten percent female respondents felt quite seldom and 2.5 percent females quite often lost their weight. This finding also have been supported by the author (19) that more centrally disposed adipose tissue in shift workers.

Tabulating all the responses of the respondents, fifteen percent male responded that they almost never suffered from chronic back pain, forty point five percent male and seventeen point five percent female respondents quite seldom and two point five percent male and twenty percent quite often suffered from chronic back pain.

Most of the respondents in both the categories were of same opinion that gastric problem aggravated with shift work. Of all the selected respondents sixty percent male and forty percent female respondents responded that they almost never suffered from bronchial asthma.

### Health related problem amongst shift workers

<table>
<thead>
<tr>
<th>Statements</th>
<th>Responses</th>
<th>M</th>
<th>F</th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetite is disturbed</td>
<td></td>
<td>11(27.5)</td>
<td>1 (2.5)</td>
<td>9 (22.5)</td>
<td>9 (22.5)</td>
</tr>
<tr>
<td>Get a feeling of nauseous</td>
<td></td>
<td>23 (57.5)</td>
<td>15 (37.5)</td>
<td>1 (2.5)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Suffer from stomach-ache</td>
<td></td>
<td>18 (45.0)</td>
<td>7 (17.5)</td>
<td>7 (17.5)</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Complain of digestion difficulties</td>
<td></td>
<td>12 (30.0)</td>
<td>12 (30.0)</td>
<td>9 (22.5)</td>
<td>4 (10.0)</td>
</tr>
<tr>
<td>Suffer from constipation</td>
<td></td>
<td>4 (100)</td>
<td>7 (17.5)</td>
<td>5 (12.5)</td>
<td>6 (15.0)</td>
</tr>
<tr>
<td>Suffer from aches and pains in chest</td>
<td></td>
<td>24 (60.0)</td>
<td>15 (37.5)</td>
<td>1 (2.5)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Suffer from shortness of breath when climbing stairs</td>
<td></td>
<td>18 (45.0)</td>
<td>6 (15.0)</td>
<td>6 (15.0)</td>
<td>8 (20.0)</td>
</tr>
<tr>
<td>You have high blood pressure</td>
<td></td>
<td>13 (22.5)</td>
<td>9 (22.5)</td>
<td>2 (50.0)</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Gain weight since beginning shift work</td>
<td></td>
<td>1 (2.2)</td>
<td>5 (12.5)</td>
<td>12 (30.0)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>you lost weight since beginning shift work</td>
<td></td>
<td>24 (60.0)</td>
<td>11 (27.5)</td>
<td>4 (10.0)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Have you suffered from any of the following?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chronic back pain</td>
<td></td>
<td>6 (15.0)</td>
<td>17 (42.5)</td>
<td>7 (17.5)</td>
<td>1 (2.5)</td>
</tr>
<tr>
<td>Gastric</td>
<td></td>
<td>2 (5.0)</td>
<td>13 (32.5)</td>
<td>9 (22.5)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>Bronchial asthma</td>
<td></td>
<td>24 (60.0)</td>
<td>16 (40.0)</td>
<td>5 (12.5)</td>
<td>4 (10.0)</td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td>18 (45.0)</td>
<td>12 (30.0)</td>
<td>5 (12.5)</td>
<td>4 (10.0)</td>
</tr>
<tr>
<td>Depression</td>
<td></td>
<td>24 (60.0)</td>
<td>12 (37.5)</td>
<td>1 (2.5)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>Arthritis</td>
<td></td>
<td>23 (57.5)</td>
<td>14 (35.0)</td>
<td>1 (2.5)</td>
<td>7 (17.5)</td>
</tr>
<tr>
<td>Anaemia</td>
<td></td>
<td>24 (60.0)</td>
<td>3 (7.5)</td>
<td>7 (17.5)</td>
<td>3 (7.5)</td>
</tr>
<tr>
<td>Headache</td>
<td></td>
<td>19 (47.5)</td>
<td>3 (7.5)</td>
<td>4 (10.0)</td>
<td>2 (50.0)</td>
</tr>
</tbody>
</table>

Approximately half of the total respondents almost never suffered from diabetes and twelve point five percent male, ten percent female quite seldom and two point five percent male suffered from diabetes. Sixty percent male and thirty eight percent female respondents reported that they almost never suffered from depression and only two point five percent female quite seldom suffered from depression.

Fifty eight percent male, thirty five percent female respondents almost never suffered from arthritis and only two point five percent male, five percent female shift worker quite seldom suffered from arthritis problem.

Responses related to anaemia reveal that sixty percent male, seven point five percent female responded that they almost never suffered from anaemia and seventeen point five percent female respondents quite seldom and seven point five percent per cents females quite often and seven point five percent females almost always suffered from anaemia.

Approximately forty eight percent males and seven point five percent females responded that they quite seldom suffered from headache and seven point five percent males, and ten percent females quite often and five percent male, twenty two point five percent female almost always suffered from headache. Shift workers are more likely to experience headaches, muscle pain respiratory infection and general malaise these in turn result in higher rates of absenteeism employee turnover (20).
Effect of Rotational Task on Physiological Parameters

Blood Pressure:
On the whole the average mean blood pressure in the morning of selected 40 respondents was found to be 102.54 mmHg and there was a rise in the average mean blood pressure in the evening i.e. 108.61 mmHg. It was observed that there was a rise in the average mean blood pressure of the selected respondents from morning to evening and the average difference was calculated to be 7.88 mmHg.

The standard deviation values were calculated for the average mean blood pressure in the morning, evening as well as for the difference values were calculated, which came out to be 6.05, 7.16 and 3.04 respectively.

The effects of work on blood pressure and changes in heart rate. There was a sharp rise in the systolic pressure during dynamic work and a considerable rise in the diastolic pressure in case of static work, thus lowering the pulse pressure to a considerable extent.(21)

Cumulative exposure to job strain among dual career women resulted in significant increase in systolic blood pressure especially those with low levels of social support at work. High blood pressure increases the risk of cardio vascular diseases (21). On the whole the average means blood pressure in the morning of selected 40 respondents was found to be 102.54 mmHg and there was a

Pulse Pressure:
The average pulse pressure of the respondents in the morning was reported to be 34.15 mmHg and in the evening the average pulse pressure was found to be 37.97 mmHg, with an average difference of 4.62 mmHg from to evening. A considerable difference of 4.62 ±2.67mmHg was noted in the pulse pressure from morning to evening.

Heart Rate
The heart rate was taken with the help of Polar Heart Rate Monitor and the readings for the average heart rate in the morning were found to be 78.77±4.56 beats/min, and the average heart rate in the evening was found to be 86.07 ±6.46beats/min. A significantly high difference of 7.32 ±5.74 beats/min was found on an average in the readings of morning and evening.

Temperature
The data gathered about the temperature of the respondents revealed that the average temperature in the morning for the experimental group respondents was 98.11±0.67°F and the average evening temperature was 98.54 ±0.59°F respectively. The difference in the morning evening readings was not very significant i.e.0.38±0.24°F.

Effect of Rotational Task on Psychological Parameters:
Shift work affects the physical work capacity of the workers as well as their mental work capacities too, and if continued for long periods or at excessive levels lead to deterioration in performance.

On the basis of research by NIOSH and many other organizations, it is widely believed that differences in rates of mental health problems (depression and burnout) for various occupations are due partly to differences in job stress levels.

To ascertain the psychological effect of stress different tests were performed and the results of the different tests reveal the following information:
Night shift is correlated to sleeping disturbance but it is unclear if night shift leads to fatigue symptoms (22).

The symptoms reported by night shift work include sleepiness, sadness, and difficulty concentrating, with numerous complaints about cumulated fatigue and disturbed social life. (23,24)

Fatigue Severity Scale
The Fatigue Severity Scale (FSS) is a method of evaluating the impact of fatigue. The FSS questionnaire contains nine statements that rate the severity of fatigue symptoms. It reflects the condition during the past week and the extent to which people agree or disagree. The scoring was done on the basis of the total scores of the person. If the total score was less than 36 then it suggests that they may not be suffering from fatigue. A total score of 36 or more suggests that they may suffer from fatigue.

Majority of the respondents, male and female had scores equivalent or more than 36 points, thus represents more fatigue felt by workers during last few weeks and 30 per cent had scores less than 36 points, representing less fatigue felt by workers during last few weeks. Similar findings were reported
by the author (25) through Fatigue Severity Scale (FSS). (fig.1)

**Letter Cancellation Test (LCT)**

The Letter Cancellation Test sheet consisted of a random block of alphabets (A-Z). The respondents were asked to cancel out total number of vowels alphabet at a given time period of 30 seconds and write their responses in the space provided. The test was performed on a morning-evening basis and the scores obtained by the respondents were as follows:

- The average score for the LCT in the morning was obtained to be 23.43.
- The average score for the same in the evening was calculated to be 20.18.
- A significant difference of 3.25 found to be in scores from morning to evening (fig.2)

![Scores of the Fatigue Severity Scale (FSS)](image)

![Scores of the Letter Cancellation Test (LCT)](image)

**Fig.1: Impact of psychological parameters amongst shift workers**

**Health and Social Effects of Shift Work Workplace Recommendations**

After an exhaustive review of the possible shift work management techniques, a manual entitled Shift Workers Guide was prepared which included recommendations which are beneficial for the shift workers. The best solution to the problems of shift work would be to eliminate it but this is not often a practical possibility. Shift work is likely to continue to be a reality for a large percentage of rotational shift workers. There are two basic levels where improvements can be made:

- **The organizational level** - primarily through the design of shift schedules, education and better facilities.

**The organizational level**

Following aspects can be considered at the Organizational levels:

- It is recommended that shifts rotate forward from day to afternoon to night because circadian rhythms adjust better when moving ahead than back.
- Avoid quick shift changes.
- Consider the time at which a shift starts and finishes. Early morning shifts are associated with shorter sleep and greater fatigue.
- Provide a rest period of at least 24 hours after each set of night shifts. The more consecutive nights worked, the more rest time should be allowed before the next rotation occurs.
- Inform shift workers of their work schedules well ahead of time so they and their families and friends can plan activities. Allow as much flexibility as possible for shift changes. Keep schedules as simple and predictable as possible.
- Provide good cafeteria services so a balanced diet can be maintained. The nutritional needs differ between day shifts and other shifts because of circadian rhythms.

**The individual level** - helping workers to get better sleep, a healthier diet, and the reduction of stress

**Guidelines for Diet and Eating Patterns**

- Maintain regular eating patterns as much as possible. Balanced, varied meals are very important. Keep family meal times the same even though the work routine constantly changes. Family meals may need to be altered in content to suit the shift worker.
- Time meals carefully. Afternoon workers should have the main meal in the middle of the day instead of the middle of the work shift. Night workers should eat lightly throughout the shift and have a moderate breakfast. This way they should not get too hungry while sleeping during the day and digestive discomfort should be minimal.
- Pay careful attention to the type of food eaten. Drink lots of water and eat the usual balance of vegetables, fruit, lean meat, poultry, fish, dairy products, grains and bread. Eat crackers and fruit instead of pop and candy bars during work breaks. Reduce the intake of salt, caffeine, and alcohol. Avoid greasy foods, particularly at night.

**Relaxation Techniques**

Give enough relax and get rid of work time stress through:

- Meditation.
- Reading.
- Lie down on bed / easy chair.
- Watching TV.
- Listing music.

**Sleep**

Sleep on a set schedule to help establish a routine and to make sleep during the day easier. Some people may prefer to get a full period of rest just before the next work shift (as it is with "normal day" work). Try different patterns of work and sleep to see which is best for you.

Make sure that family and friends are aware of and considerate of the worker's sleep hours and needs. Ensure that the shift
worker has a comfortable, dark, quiet place to sleep during the day. Air conditioning, a telephone answering machine, and good blinds on windows are recommended.

CONCLUSION
The evaluation of psycho physiological parameters reveals that though physiologically speaking the task is very light but still it is psychologically demanding task requiring high level of alertness at all times of the day. At the morning time, person feels fresh and active. As the day passes by, alertness and activity level of the employees goes down gradually and reaches its peak at the end of the shift this adds to mental pressure leading to stress and fatigue at work besides being repetitive monotonous task. Shift workers are tired and sleepy because of their work schedule. The disturbance of circadian rhythms can affect concentration, motivation, and reaction time, particularly at night. This combination can result in an increased risk of accident and injury. The stress of shift work can also aggravate health conditions, such as heart disease or digestive disorders. On the other hand, rotational workers need to maintain a balance and the reduction of stress. The manual was primarily through the design of shift schedules, why shift work is hazardous, coping strategies of shift work etc.

Keeping in mind the general view, to suggest possible guidelines to reduce the work load and increase work efficiency of rotational workers. People who work shifts face many problems that others do not recognize. The difficulties stem from the change in eating, sleeping, and working patterns. The best solution to the problems of shift work would be to eliminate it but this is not often a practical possibility. Shift work is likely to continue to be a reality for a large percentage of rotational shift workers. There are two basic levels where improvements can be made: the organizational level - primarily through the design of shift schedules, education and better facilities. The individual level – helping workers to get better sleep, a healthier diet, and the reduction of stress. The manual was developed for shift workers/rotational workers which is both practicable and applicable for all the shift workers of the reservation counter. An overwhelming response was given for booklet by the sample population.

REFERENCES