1. INTRODUCTION

Today an increasing number of workers do night and shift work as part of their work contract. There are a number of reasons but not limited to are, economies of continuous production, business needs, the need to provide a 24 hour commercial or emergency service, summer and Ramadan period restricted working hours and globalization.

Federal Law no. 8 (UAE Labor Code) and Dubai Municipality Local Order 61 of 1991 clearly emphasizes the role of employers to take every precaution necessary for the protection of his/her workers and ensure their safety from any occupational illness or potential work accidents. The employer shall also initiate appropriate control measures to improve work conditions and thereby provide healthy environment for his/her workers.

The objective of this guide is to minimize any adverse Health and safety effects of night and shift work on employees/workers and to employer.

This guide describes measures employers and employees shall adopt at work to reduce any adverse health effect and prevent injuries to night or shift workers and loss to business.

2. SCOPE

This technical guideline shall apply to all commercial and industrial establishments, public and government institutions, including construction-project sites in Emirate of Dubai.

3. DEFINITION

Night time

For the purpose of this technical guideline, the period between 2000hrs and 0700hrs on the following day.
Night Work

For the purpose of this guidelines, work carried out in "night time".

Night Worker

Employee/worker engaged in night work

Shift Work

Method of organising work, where by workers/employees succeed each other at the same work station, according to certain pattern of working hours. Such as rotating pattern, and which may be continuous or discontinuous, entailing the need for workers to work at different times over a given period of days or weeks.

Shift Worker

Worker/employee who work in shift work.

4. GUIDELINES

A. Risk Assessment requirements and factors to be considered

All employers having their work activities which needs to be performed during night and/or in shifts work, shall only be performed on conducting appropriate risk assessment for these activities and implementing suitable defined controls to prevent ill health and injury at work.

For appropriate risk assessment following risk factors related to night and shift work shall be considered:

**Work load** - Mental and physical demand for performing the work such as, workers with appropriate work load are more effective and productive. This will be less fatigue than those with very high or very less work to do. Concentration and productivity tend to decline towards the end of the shift or during night time work and may result in ill health effect and incidents.

**Work activity** - Monotonous work activity for long duration may lead to fatigue and result in untoward incident, variation in work activity or periodic rest across a shift can help relieve fatigue.
Shift pattern and shift rotation - Permanent shift workers have the risk of chronic sleep debt, fatigue, ill-health and disruption of family and social life. Also, constantly changing (fast and slow) shift pattern means workers may have difficulty adapting to the schedule.

Shift timing - Risk of errors and accidents are higher at night shift due to fatigue and lack of alertness, which results from lack of sufficient sleep.

Shift duration - Eight hours shift is considered adequate, anything more than this may create fatigue or other ill health issues.

Rest breaks within and between shifts - Short or long breaks could be an issue for the person doing overtime where required or joining. Also, long breaks could lead to unalert and unrefreshed at work which may further result in incidents.

Physical environment - Such as lighting, glare, temperature, ventilation and humidity (at the work place), if not controlled to the required level could result in ill-health and accidents at work place.

Physical work place conditions - Such as excavation, ground levels and other obstacles, could result in serious injuries if not taken appropriate control, specifically during night work.

Management issues - Such as overtime, shift swapping, standby and on call duties, training and information, communication needs to be given attention to reduce stress on indiviudal/team, loss of information and reduces unalertness at work. Thus help in reducing fatigue and preventing incidences at work.

Individual factor - Individual react differently to the effects of night shift, this is mainly due to combination of individual's factors such as age, gender, lifestyle, attitude and behaviour.

Social and family factors - Workers who do not have sufficient time to interact with their families and friends because of shift working and the need to rest in between may feel deprived and isolated, leading to moodiness and negativity. This behaviour may affect in work performance and result in unwanted errors leading to incidents.
Health assessment - Person working during night and shift works, are liable to have health issues. Considering this, periodic health assessment is essential tool to identify early symptoms of ill-health and prevent further illness.

B. General recommended practices for employers in view to prevent ill-health and injury effects to night and shift work employees of their establishments

In case of working in night and shift work, following risk controls measures may be exercised as applicable:

Avoid scheduling dangerous, demanding, monotonous and/or safety critical work during early morning, night or towards the end of long shifts or during other periods of low alertness.

Avoid workers on permanent night shift as feasible.

Workers may be asked of choice between rotating and regular shift schedule wherever practicable.

Wherever possible, arrange shifts start/end times to be convenient for public transport or consider providing transport for workers on particular shifts.

Limit shifts to a maximum of twelve hours (including overtime) and consider the needs of vulnerable workers.

Limit night shifts or shifts where work is demanding monotonous, dangerous and/or safety critical to eight hours.

Consider if shifts of a variable length or flexible start/end times could offer a suitable compromise.

Avoid split shifts unless absolutely necessary for business needs.

Encourage and promote the benefits of regular breaks away from the work station.

When switching from day to night shifts or vice versa, allow workers a minimum of two nights of full sleep.
Build regular free weekends (or at least one weekend day) in to the shift schedules.

Mutually get agreed on timing and procedures for communicating information between successive shift teams and ensure they are followed at all times.

C. Recommended practices for employees/individuals in view to prevent illhealth and injury during night and shift work

During driving to and from the workplace to accomodation
Fatigue increases the risk of having vehicle accidents, especially after a long shift or night work or before commencing an early shift. Accordingly, following controls may be exercised:
- Do not drive if overtired.
- Get a lift or use public transport or a taxi if possible
- Drive carefully and do not speed
- Stop for a quick rest if you feel sleepy while driving

Sleep pattern
Try to develop a regular sleep pattern including at least seven to eight hours sleep. If you cannot sleep make sure you are at least resting. Find out the best time for you to sleep and stick to this pattern.

Diet
Digestive problems are common with shift workers both because of the timing of meals and the quality of food. Plan your meals so that they help keep you alert at work and sleep and rest during your rest period.

Stimulants and sedatives
Caffeine and cigarettes are stimulants which can keep you alert while alcohol and sleeping pills are sedatives which make you drowsy and sleepy.

However, these stimulants and sedatives be avoided, as regular use reduces these effects and can lead to dependence and associated health problems.
Physical activity
Regular exercise keeps you fit, burns off calories and helps you sleep. Regular exercise promotes a healthy heart and keeps weight down, thereby reducing the risk of diabetes. At least 30 minutes daily exercise is recommended and this can be split in to two if necessary.

Exercise can be as simple and inexpensive as a walk, jog, cycle or exercising at home.

Keeping alert at work
There may be periods during shift work, especially early morning and night work, when it is difficult to keep alert. In such scenario keep involve yourself in possible physical activities such as walking, standing and stretching body etc.

D. Recommended practices for employer in view to prevent illhealth and injury during the Holy month of Ramadan due to work in night and shift duties

Employer need to give due consideration on fasting employees health status and adequate relaxations in duty hours directed by legislation. In addition to above applicable controlled mentioned

Employee shall maintain adequate control on diet and shall take required rest and sleep as suitable to maintain individual's health status to cope up with night /shift work. In addition to above mentioned applicable self-control.

Many employers shift their work activity during night time considering legislative restriction of summer working hours and this may lead to incidences at work place and absenteeism due to health issues. Considering this, all employers to ensure adequate yearly work planning so that there will be no need to schedule work during night shift, in the period of Ramadan and hot summer season.

E. Ensuring safe work zone during night work

In peak summer season, most of the employers re-schedule their work for night time and this is apart from the regular night shift work (wherever essential) due to nature of business. This demands appropriate safe work zone management to prevent injuries and illness of employees when working during night shifts.
One of the major factors to ensure safety during night work, is to have appropriate arrangement of lighting at work place, accordingly following guidelines shall help in ensuring required illumination at work place:

**Night time work zone - illumination levels**

Three categories are recommended below related to night time lighting guidelines for work zones for construction and other works:

Level 1: Illumination is important in areas where the work crew is in motion, moving from spot to spot. This level of illumination is appropriate for tasks requiring low accuracy, involving slow moving equipment, and where there are large objects to be seen. The recommended average minimum maintained illuminance is 54 lux.

Level 2: Illuminance is recommended for areas on or around construction equipment to provide a safer environment for the workers operating the equipment, allowing them to perform tasks that require a moderate level of accuracy. The recommended average minimum illuminance is 108 lux.

Level 3: Illuminance is appropriate for those tasks that require a greater level of visibility or for tasks with a higher level of difficulty. The recommended average minimum illuminance is 215 lux.

With not limiting to above recommendation, employer need to do required study to have appropriate and suitable illumination at such work place to avoid glares and shadows and conduct work safely.

The following factors should be considered when selecting the types of lighting that are best suited for the work zone:

- Mobile work zone - the length of the work activity for one night may dictate either that the lighting plan be continuous for the length of the work zone or that a mobile system be used so that the lighting moves with the various work activities.
- Stationary work zones - work duration would determine the type of lighting in this situation. That is temporary movable fixtures or permanent fixtures if to be continued for long duration etc.
- Glare - glare from the lighting system should be minimised for both the workers and any adjacent motorist. Glare should be considered from each direction and on all approaching roadways and opposing lanes of traffic.
• Shadow – shadow could affect the operators visibility and workers movements and thus to be avoided. In-appropriate / insufficient lighting arrangements may result in shadows at work.

Assessment of lighting in the work place should take account of the following aspects:

• The adequacy of artificial lighting, particularly where work equipment is in use;
• Procedure for measuring levels of illumination;
• The presence of glare in its various forms;
• The efficiency of light distribution;
• Lightning maintenance and cleaning arrangements; and
• Emergency lighting arrangements.

To ensure adequate and sufficient illumination at work place, employer are recommended to prepare full proof lighting plan and shall include minimum following informations:

• Lay out showing location of light towers, its spacing, lateral placement and mounting height and clearly showing the location of all lights necessary for all work to be done at night.
• Description of light towers, other attachment for the equipment, fixtures to be used and related power source.
• Specific technical details related lighting equipments to be used.
• Information details of any hoods, louvers, shields or other means to be used to control glare.
• Illumination lighting calculation confirming to the lay out requirement.

Other night work related control

It is recommend that no work to be scheduled for night time unless essential. When essential night work safety plan to be prepared by the employer to ensure organised safety control on the activity performed during night time.

In addition to applicable general guidance mentioned above, followig night time specific controls are recommended to be adopted at work as applicable;

Provide facilities and opportunities for shift workers which are similar to those for day time workers.

Ensure that workplace lighting is adequate and adjustable as needed.
Ensure that the work place temperature is adjustable and allows workers to carry out work in reasonably comfortable manner.

Provision for increasing supervision during the period of low alertness in night time work.

Ensure supervisors and team members with responsibility for shift working arrangements are aware of the risks of shift work and can recognise problem caused by shift work.

Encourage interaction between workers on the same shift and provide a means of communication for lone workers (note: avoid lone working during night or shift duty specifically when need to work in remote areas)

Ensure that the workplace and its surrounding are well lit and safe and secure so that night shift workers are not at risk of violence.

While working on traffic roads or near to live traffic, traffic authority guidelines related to traffic signage, illumination, barriers to be adhered.

Work place signages / instruction posters shall be of reflective type or adequately illuminated to have clear visibility to workers working during night time and also for stakeholders.

F. Training

Industries/organisations where night and or shift work is in practice shall prepare training plan and implement it to ensure the required level of awareness is being created among the persons involved in this kind of duties.

The training should cover the risk associated with night and shift duties and related control measures as specified in this guidelines, recognise the health symptoms which may occur in individual while performing the work and necessity or schedule of health check up (as needed), driving guidelines, emergency preparedness, security awareness.

The training to be delivered by competent persons and contents of training to be verified by competent persons.
This training can be given in various form such as induction, job relevant specific essential training and tool box talks for workers if involved in night and shift duties.

G. Medical Screening of an Employee

There could be a pre-existing medical condition by which night work could affect adversely. Considering this, it is recommended to conduct medical examination of individual prior to employment and there after periodic health assessment by registered medical practitioner (recommended: to be done every six months) to verify any adverse health effects of night or shift work on the individual's health.

The follow up assessments are a form of health surveillance in that they seek to determine if the night work is having a detrimental effect on the night worker's health. The assessment must be provided free of charge to the employee.

Organisation shall ensure availability of medical facility support, to have compliance with above screening. The record or screening to be made available to DM inspectors on demand. (see Annex A, Register of employees health status).

H. Emergency Preparedness

All employers to ensure they have prepared to mitigate with all kind of medical/ fire/traffic/security incidents / emergencies, which may arise in due course of night and shift work through training and ensuring all required resources are available.

In case of lone working (please note that lone working is not to be encouraged unless essential and not avoidable) or limited resources during night or shift work, all employees to be made aware of dealing with such emergencies.

Periodic drills related to applicable emergencies to be conducted as per legislation to be conducted.

Remember to dial – 998 or 999 in case of any emergencies.
I. Monitoring

Organization may conduct periodic inspections/ Audit to verify implementation of these guidelines applicable to them.

Deviation from the required control may lead to health issues, absenteeism and incidents in the organization. Monitoring of these indirect results with inspection / audit results will help in identifying the gap in existing system.

Corrective and Preventive actions identified based on the guidance will result in improvising the situation and thus minimizing health issues and incidents in the organization due to night and shift work.

5. REFERENCES

Health and Safety Authority: Guidelines for Employers and Employees for Night and Shift Work (UK)

US Department of Transportation - Federal Highway Administration.
ANNEX A: REGISTER OF EMPLOYEES HEALTH STATUS

<table>
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<tr>
<th>Name of Employee</th>
<th>Designation</th>
<th>Date of Joining</th>
<th>Medical Status Prior to Joining</th>
<th>Current Medical Status</th>
<th>Next Medical Check-up Due On</th>
<th>Name of Health Center</th>
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Further information is available from:

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