



UrbanUtilities

PRO706 - FATIGUE RISK MANAGEMENT PROCEDURE

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1. PURPOSE

The purpose of this procedure is to provide guidance in the Fatigue Risk Management System (FRMS).

This includes:

- Responsibility and governance;
- Training and education;
- Risk assessment and mitigation, and;
- Monitoring and evaluation.

2. SCOPE

This procedure applies to all workers across Urban Utilities.

3. DEFINITIONS AND ACRONYMS

- **AQF** – Australian Qualifications Framework;
- **Days between Resets** – number of consecutive shifts;
- **FRMS** – Fatigue Risk Management System;
- **KSS** – Karolinska Sleepiness Scale;
- **NHVR** – National Heavy Vehicle Regulator;
- **PCBU** – person conducting a business or undertaking;
- **pFLS** – Personal Fatigue Likelihood Score;
- **Short Break Duration** – time between shifts; and
- **Worker** - person who carries out work in any capacity for a person conducting a business or undertaking. This includes employees, contractors, sub-contractors, apprentices, trainees, volunteers and work experience students.
- **Sufficient sleep** – at least 5 hours of sleep in the previous 24 hours, and at least 12 h of sleep in the previous 48 hours.

4. ROLES AND RESPONSIBILITIES

4.1 Executive Leadership Team

- Endorse and support the Fatigue Risk Management Procedure to ensure that fatigue risk is appropriately managed within Urban Utilities;
- Provide the resources for appropriate fatigue risk management activities, including resources for the implementation of the FRMS and associated training, education, and monitoring;
- Promote a reporting culture in which fatigue reporting is common and expected; and
- Ensure that legislative obligations are met with regards to the provision of safe systems of work.

4.2 Managers and Supervisors (Including Schedulers)

- Undertake training to ensure that FRMS procedures are implemented and monitored appropriately;

- Ensure that monitoring and evaluation procedures are followed, to ensure that procedural requirements and guidelines are met, and that they are effective in mitigating fatigue related risk;
- Promote a constructive culture in which workers feel they can report fatigue without repercussions;
- Ensure that rostering systems are developed in line with relevant industrial instruments, agreements, guidelines (Appendix 1), to ensure that workers have adequate time between shifts for rest and recovery; and
- Ensure consultation with relevant workers when designing rosters, determining consequence levels, and when implementing fatigue control strategies.

4.3 Workers

- Comply with fatigue-related responsibilities under the shared responsibility framework;
- Complete relevant fatigue training as instructed;
- Use time away from work to obtain sufficient sleep, to ensure duties of care requirements are met; and
- Report fatigue using the appropriate channels if 1) they are experiencing the signs and symptoms of fatigue, or 2) they have obtained fewer than the required hours of sleep in the previous 24 or 48 hours.

4.4 Health & Safety Team

- Monitor and evaluate hazard and incident data with regards to fatigue;
- Conduct investigations in collaboration with the relevant leader to determine whether adverse events or accidents are consistent with a fatigue-related error; and
- Manage the implementation of the Fatigue Risk Management System, including responsibility and governance, training and education, risk assessment and mitigation, and monitoring and evaluation.

5. PROCEDURE

In order to manage fatigue risk, the following procedure must be followed.

5.1 Responsibility and governance

Urban Utilities is committed to maintaining the health and safety of their workers.

Urban Utilities operate under a shared responsibility framework. This framework outlines a dual duty of care with regards to fatigue management.

It is the responsibility of the organisation to:

- Develop and maintain appropriate safe systems of work;
- Ensure that rosters provide sufficient time away from the workplace for workers to have enough sleep. This may include both bio-mathematical modelling and roster dimension analysis, and must take into consideration workgroup and worker circumstances;
- Provide appropriate fatigue training for team members, leaders, supervisors, and schedulers;
- Ensure that there is at least one appropriately qualified individual to oversee the development, implementation, and monitoring of the FRMS;
- Ensure that appropriate consultation is undertaken with regards to rostering, fatigue risk management, and the implementation of new systems; and

- Develop achievable milestones for the implementation of FRMS requirements, including specific deliverables and deadlines.

It is the responsibility of workers to:

- Undertake relevant training and education as determined by the organisation;
- Implement and utilise relevant fatigue risk management documentation;
- Adhere to the fatigue risk management procedure;
- Use time away from work to obtain sufficient sleep; and
- Use appropriate channels to report if they have either had insufficient sleep in the previous 24 or 48 hours, or if they are experiencing any signs or symptoms of fatigue

5.2 Rostering Hours of work guidelines

5.2.1 Operational and Field Employees' Hours of work

Definitions

Day worker: A day worker is an employee whose ordinary hours of work are inside 0600 – 1800 h, Monday to Friday.

Shift worker: A shift worker is an employee whose ordinary hours of work are outside 0600 – 1800 h, Monday to Friday.

Fatigue-regulated driving hours: Fatigue-regulated driving hours apply to work that is done in and in relation to fatigue-regulated heavy vehicles¹. Fatigue-regulated driving hours include any time that is spent:

- driving a fatigue-regulated heavy vehicle;
- loading and unloading the vehicle;
- inspecting, servicing or repair work;
- attending to the load or to passengers (on a bus);
- cleaning or refuelling the vehicle;
- instructing or supervising another person including learning to drive a heavy vehicle, learning a new route, making deliveries etc.; and
- recording information or completing a document (for example your work diary).

It doesn't matter if the tasks occur on private property or on a road or road related area, they are still classified as fatigue-regulated driving hours.

Where these tasks are performed, guidelines specified in the following table as fatigue-regulated driving hours apply.

In many instances, a mix of fatigue-regulated driving hours and standard work hours (i.e. tasks that are not defined above as fatigue-regulated driving hours) may be performed. Where work comprising

¹ At Urban Utilities, the only vehicles that currently fall within the National heavy vehicle driver fatigue laws are:

- 4) a truck, or a combination including a truck, with a GVM of over 12t with a machine or implement attached. (the only vehicle that falls within this category is a tipper towing a five (5) tonne excavator)

For more information see the National Heavy Vehicle Regulator website: <https://www.nhvr.gov.au/>

fatigue-regulated driving hours is performed, work time must align with the fatigue-regulated driving hours defined in the table below. These work periods must also comply with standard Urban Utilities hours of work guidelines.

E.g. a shift worker performs a 12-hour shift starting with a 6-hour continuous drive where fatigue-regulated driving hours apply. Prior to reaching 5.5 hours of continuous fatigue-related driving hours, the employee must have a continuous 15-minute break. After completing this drive, the employee may continue their 12-hour shift. During the rest of their shift, 15 additional minutes of break time must occur, though this break time does not need to be continuous.

Roster guidelines

Roster dimension	Guideline
Hours of work	<ul style="list-style-type: none"> Day workers: Ordinary Hours of work are 38 hours per week averaged over a period of 28 days Shift workers: An average of 38 Ordinary Hours, over a period not exceeding ten (10) weeks
Rostering of ordinary hours	<ul style="list-style-type: none"> Day workers: Maximum of 10 ordinary hours on any given day (excluding unpaid meal breaks), or by written agreement between the employee and Urban Utilities, a maximum of 12 ordinary hours on any day. Shift workers: An average of 38 ordinary hours, over a period not exceeding 10 weeks.
Breaks	<ul style="list-style-type: none"> Day workers: No more than five continuous hours of work without a break of not less than 30 minutes. In the case of unforeseen circumstances, the meal break may be delayed and will be taken as soon as practicable, subject to the observance of appropriate health and safety standards. A paid morning and afternoon break of 10 minutes each for Day Workers, which may be combined to one 20-minute break if operationally viable. Shift workers: 20 minutes of break time during 10-hour shifts or less (which will count as time worked), or 30 minutes of break time for shifts 10 hours or more (which will count as time worked). No more than 5-hours worked before the first break is taken or between subsequent breaks, if any.
Number of consecutive days of work	<ul style="list-style-type: none"> At least 10 consecutive hours off duty between the work on successive days or shifts (which does not include being on call).

<p>Employees who operate a Heavy Vehicle solo (where the vehicle is greater than 12 tonne) performing fatigue regulated-driving hours.</p> <p>** Only applies to those employees who operate a tipper towing a five (5) tonne excavator solo*****</p>	<ul style="list-style-type: none"> • Maximum of 72 <u>fatigue regulated-driving hours</u> may be worked in a 7-day period. This must include one 24-h break. • No more than 144 <u>fatigue-regulated driving hours</u> may be worked in a 14-day period. This must include 2 x night rest breaks², and 2 x night rest breaks taken on a consecutive day. • If performing <u>fatigue-regulated driving hours</u>, shift maximum is 12 hours and cannot be extended. • If performing <u>fatigue-regulated driving hours</u>, employees must have a minimum of 7 hours of stationary rest time³ per 24-hours. • Except at regular changeover of shifts, only one shift may be rostered per 24 hours. • If performing <u>fatigue-regulated driving hours</u>, the following breaks apply: <ul style="list-style-type: none"> • For every period of 5.5 hours, 15 minutes continuous rest time after no more than 5.25 hours of work time • For every period of 8 hours, 30 minutes of rest time in blocks of 15 continuous minutes after no more than 7.5 hours of work time • For every period of 11 hours, 60 minutes of rest time in blocks of 15 continuous minutes after no more than 10 hours of work time
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5.2.2 Administrative and Technical Employees

Roster dimension	Guideline
Hours of work	<ul style="list-style-type: none"> • Day Worker: Ordinary hours of work are either 36.25 or 38 hours per week averaged over a period of 28 days • Shift workers: Ordinary hours of work are 38 hours, or if the event clause 3.2.2 applies, an average of 36.25h/week is the maximum,

² Night rest breaks are 7 continuous hours stationary rest time taken between the hours of 10pm on a day and 8am on the next day (using the time zone of the base of the driver) or a 24 continuous hours stationary rest break.

³ Stationary rest time is the time a driver spends out of a heavy vehicle or in an approved sleeper berth of a stationary heavy vehicle.

	averaged over a period not exceeding 10 weeks.
Rostering of ordinary hours	<ul style="list-style-type: none"> Maximum of 10 ordinary hours (excluding unpaid meal breaks), or by written agreement between the employee and Urban Utilities, a maximum of 12 ordinary hours.
Minimum break between shifts	<ul style="list-style-type: none"> Minimum 10-hour break between shifts. Off duty does not include being on call.
Breaks	<ul style="list-style-type: none"> Day workers: No more than 5 hours of consecutive hours of work without a 30-minute break. In the case of unforeseen circumstances, the meal break may be delayed and will be taken as soon as practicable, subject to the observance of appropriate health and safety standards. An additional 10-minute break for morning and afternoon tea. This can be combined into one 20-minute break if operationally viable. Shift workers: If working a shift of fewer than 10 hours, a 20-minute break, counting as time worked. If shift duration is 10 hours or longer, total break time is a minimum of 30 minutes, counted as time worked. No more than 5 hours of consecutive work before the first break or between breaks, if any.

5.2.3 Water Industry Award 2010 (covers employees who are not covered by one of Urban Utilities' Enterprise Agreements.

Roster dimension	Guideline
Hours of work	<ul style="list-style-type: none"> Day workers: 38 ordinary hours of work per week
Rostering of ordinary hours	<ul style="list-style-type: none"> Day workers: The ordinary working hours are an average of 38 hours per week over a period of 28 days and will be worked within the span of hours 6.00 am to 6.00 pm Monday to Friday. Shift workers: Average of 38 ordinary hours/week, over a period not exceeding 8 weeks.
Minimum break between shifts	<ul style="list-style-type: none"> Minimum 10-hour break between shifts or successive days.
Breaks	<ul style="list-style-type: none"> Day workers: Not more than 5 consecutive hours of work without a break (minimum 30-minute break). In the case of unforeseen circumstances, the meal break may be

	<p>delayed and will be taken as soon as practicable, subject to the observance of appropriate health and safety standards.</p> <ul style="list-style-type: none"> • Shift workers: If working a shift of fewer than 10 hours, minimum of one 20-minute break, counting as time worked. If shift duration is 10 hours or longer, total break time is a minimum of 30 minutes, counting as time worked.
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5.2.4 SAS Laboratory Employees' Enterprise Agreement 2017

Roster dimension	Guideline
Hours of work	<ul style="list-style-type: none"> • Ordinary hours of work are either 36.25 or 38 hours per week averaged over a period of 28 days.
Rostering of ordinary hours	<ul style="list-style-type: none"> • Day worker: Maximum of 10 ordinary hours (excluding unpaid meal breaks), or by written agreement between the employee and Urban Utilities, a maximum of 12 ordinary hours. • Shift workers: Ordinary hours of work are an average of 38 ordinary hours over a period not exceeding 8 weeks.
Minimum break between shifts	<ul style="list-style-type: none"> • Minimum 10-hour break between shifts. Off duty does not include being on call.
Breaks	<ul style="list-style-type: none"> • Day workers: No more than 5 hours of consecutive hours of work without a 30-minute break. In the case of unforeseen circumstances, the meal break may be delayed and will be taken as soon as practicable, subject to the observance of appropriate health and safety standards. • An additional 10-minute break for morning and afternoon tea. This can be combined into one 20-minute break if operationally viable. • Shift workers: If working a shift of fewer than 10 hours, a 20-minute break, counting as time worked. If shift duration is 10 hours or longer, total break time is a minimum of 30 minutes, counted as time worked. No more than 5 hours of consecutive work before the first break or between breaks, if any.

Overtime Guidelines

- Maximum of 14 hours worked continuously, (overtime and ordinary hours) with a minimum break of 10 hours after the cessation of overtime

- Any occurrence of an employee working in excess of 14 hours must complete an Incident report in the current Incident Management Software.

5.3 Training and education

There are four levels of training:

1. worker training,
2. leader, supervisor,
3. scheduler training, and
4. training of a FRMS *suitably trained individual*.

Training should be conducted in accordance with the Fatigue Management Training and Education Scope (available on ULearn).

5.4 Risk assessment and mitigation

Risk assessments must be performed if the Rostered Hours of Work guidelines (section 5.1.1) are exceeded or before they are exceeded.

Any employee demonstrating any signs of fatigue must complete a Fatigue Risk Assessment as described in this section and an Incident report must be recorded in the current Incident Management Software.

Note: Where a worker has had fewer hours of sleep than 5 hours in 24 hours or 12 hours in 48 hours, they must report to their manager/supervisor and complete a fatigue risk assessment.

5.4.1 Fatigue likelihood

Fatigue likelihood can be determined by three levels (1, 2 and 3) using the tool in *Table 2: Mapping fatigue likelihood score*. The scores determined by these levels can be used to determine an overall fatigue likelihood score, which can be used to assess the level of risk.

Level 1. Roster sleep opportunity (FAID 95%)

Bio-mathematical modelling software (FAID) should be used to identify sleep/wake opportunities when creating rosters. This software uses work schedule data to identify fatigue likelihood based on theoretical sleep opportunity and circadian information. FAID produces fatigue likelihood scores for time points within rosters.

FAID scores range from 0 – 100+, with higher scores indicative of a higher likelihood of fatigue.

Level 1. Roster dimension analysis

Roster dimension analysis can be performed to determine a fatigue likelihood score. For each roster dimension (column 1), a score is assigned based on the features of the relevant roster (row 1 and 2). Scores are summed to produce the overall level 1 roster dimension score in table 2.

Table 1: Roster dimension analysis

Roster dimension	Score				
	0	1	2	4	8
Maximum work hours per 7 days	≤36h	36-43h	44-47h	48-54h	55h+
Shift duration	≤8h	8-10h	10-12h	12-14h	≥14h

Short break duration	≥16h	16-13h	12-10h	10-8h	≤8h
Maximum hours of night work per 7 days	0h	1-8h	8-16h	16-24h	≥24h
Days between resets	<6	6	7-10	11-12	12+

Level 2: Prior sleep wake behaviour (personal Fatigue Likelihood Score (pFLS))

Prior sleep wake behaviour should be used to determine fatigue likelihood. This includes a determination of the amount of sleep the worker has recently obtained.

This information should be used to determine a pFLS, using the below calculation:

(X score) For every hour of sleep less than 5h in 24 add 4 points

(Y score) For every hour of sleep less than 12h in 48 add 2 points

(Z score) For every hour of wake greater than the hours of sleep in the last 48h add 1 point

$$\text{pFLS} = \text{X score} + \text{Y score} + \text{Z score}$$

The pFLS score typically ranges between 0 (low) -15 (extreme). Higher scores are indicative of a higher likelihood of fatigue.

Level 3: Self-reported fatigue (Karolinska Sleepiness Scale (KSS))

To determine the workers current level of alertness, use the below question.

Behavioural symptoms and monitoring are level 3 controls (i.e. how is the employee feeling *at that time*). This is a score from 1-9 that can be used to identify an individual's current level of alertness. Higher scores are indicative of a higher likelihood of fatigue:

1. Extremely alert
2. Very alert
3. Alert
4. Rather alert
5. Neither alert nor sleepy
6. Some signs of sleepiness
7. Sleepy, but no effort to keep awake
8. Sleepy, some effort to keep awake
9. Very sleepy, great effort to keep awake, fighting sleep

Record this score in Table 2.

Fatigue likelihood score

An overall fatigue likelihood score will be calculated based on the information determined by the Level 1 Level 2, and Level 3 assessments (Table 2).

The following table uses the scores from the three levels to calculate a fatigue likelihood score (column 1). One score is selected in each column based on the findings from each level.

Where there is a conflict, the highest score must be selected.

Table 2: Mapping fatigue likelihood score

Likelihood	Level 1 (Roster assessment)	Level 1 (FAID_95%)	Level 2 (pFLS)	Level 3 (KSS)
1	0-5	<40	0	1-2
2	6-11	40-60	1-4	3-4
3	12-20	60-79	4-8	5-6
4	21-25	80-100	9-12	7-8
5	25+	100+	12+	9

5.4.2 Consequence of a fatigue related incident

Leaders and supervisors, in consultation with workers and other relevant stakeholders, must complete an assessment of the potential consequences of a fatigue related incident (Table 4). This assessment must be completed for all relevant roles, and must reflect the regularly performed duties. This assessment will be pre-completed for all roles/tasks, and as such will not be necessary for completion during **standard** overtime/shift alterations. Additional assessments may be required if **non-standard tasks are required** (for example in an emergency response situation).

The following table (Table 3) should be completed by relevant managers/supervisors:

Table 3: Consequence descriptions

Consequence	Description of Consequence
A. Insignificant	Other Near Miss events
B. Minor	First Aid Near Miss relating to Non-High-Risk activities, including Manual Handling near miss Short Term illness
C. Moderate	Illness < 4 days resulting in a lost time injury of 1 to 2 days. Near miss relating to High Risk Activity. Short term disability / suitable duties injuries Medical Treatment Injury
D. Major	Serious/hospitalisation injury resulting in a lost time injury greater than 2 days Long term disability.
E. Catastrophic	Fatality and/or amputation of a limb/appendage Long term/terminal illness resulting in a lost time injury greater than 1 month Permanent Disability

Table 4: Example consequence table

Role	Role activities	Fatigue consequence rating (A-E)

5.4.3 Risk determination

Fatigue Likelihood (section 5.3.1) and the consequences of a fatigue related incident (section 5.3.2) must be used to determine the level of risk. These two measures can be used together to identify risk via a risk matrix, as can be seen in Table 5.

For example, if the likelihood of fatigue was almost certain (5), but the consequences of a fatigue-related error were minor (B), high risk may be identified. However, if the same level of fatigue was identified at a time when the consequences of a fatigue-related error were catastrophic (E), the level risk would be extreme.

Table 5: Risk Matrix

		Likelihood				
		1. Rare	2. Unlikely	3. Possible	4. Likely	5. Almost Certain
Consequence	E. Catastrophic	High 10	High 15	Extreme 20	Extreme 25	Extreme 30
	D. Major	Medium 4	Medium 5	High 10	High 15	Extreme 20
	C. Moderate	Low 3	Medium 4	Medium 5	High 10	High 15
	B. Minor	Low 2	Low 3	Medium 4	Medium 5	High 10
	A. Insignificant	Low 1	Low 2	Low 3	Medium 4	Medium 5

5.4.4. Control measures

Based on the level of risk identified, control measures can be developed and implemented. The following control measures have been identified for potential use (see Table 5). However, role- and site-specific controls that have not been listed may also be appropriate. Control measures should be determined by level of identified risk, and based on consultation between workers and leaders. Implemented controls measures should be documented on the relevant risk assessment.

Table 5: Potential control measures based on level of identified risk

Risk level	Control Measures
Low	Do nothing unless indicated by a higher-level control.
Medium	Minor increase in likelihood of fatigue. Notify co-workers and supervisors. Self-management controls usually sufficient. Typical controls include; self-monitoring, task rotation, self-paced workload, self-managed breaks.
High	Moderate increase in likelihood of fatigue. Notify co-workers and supervisors. Team and process management controls usually sufficient. Increased supervision, task re-assignment, where appropriate re-proceduralisation of tasks to reduce risk.
Extreme	Significant increase in likelihood of fatigue. Notify co-workers and supervisors. Do not continue in a safety critical task without 1-up approval and documentation based on pre-existing risk assessment. Controls unlikely to be sufficient.

Under circumstances where extreme fatigue risk is identified, work is permitted only when the risk of continuing to work is less than risk associated with stopping (i.e. exceptional circumstances). Under these circumstances, the principles of fatigue-proofing must be used. Fatigue-proofing refers to control measures that can be implemented to prevent fatigue resulting in a fatigue related incident.

5.5 Monitoring and evaluation

Monitoring and evaluation must be undertaken to ensure that:

- The FRMS is functioning as intended (i.e. is fatigue risk being managed in accordance with this procedure - *compliance*), and;
- The FRMS is effectively mitigating the risk of fatigue-related errors (*functionality*).

In determining compliance and functionality, the following metrics should be used:

- Actual hours of work compared with planned rosters;
- Overtime;
- Fatigue Risk Assessments;
- Hazard, incident, and injury data;
- Use and efficacy of control measures;
- FRMS compliance data; and
- Further opportunities for improvement.

Note: the above activities will be completed in line with the current Continual Improvement Procedure.

5.6 Appendix 1 – References

- Heavy Vehicle (Fatigue Management) National Regulation (2018)
- Work Health and Safety Act (2011)
- NHVR Standard Hours
- Safe Work Australia Guide for Managing the Risks of Fatigue at Work
- ISO31000 Australian standard for risk management
- ISO45001 International standard for occupational health and safety management systems