



Should Australia expand rail health assessments?  
Consultation Report  
May 2018



National Transport Commission

# Report outline

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<b>Title</b>	Should Australia expand rail health assessments?
<b>Type of report</b>	Consultation Report
<b>Purpose</b>	To outline the NTC's approach to consultation on the rail worker health assessment discussion paper, and the NTC's recommendations.
<b>Abstract</b>	This report summarises findings from the consultation on the rail worker health assessment discussion paper.
<b>Key words</b>	National Standard for Health Assessment of Rail Safety Workers, obstructive sleep apnoea, Category 1 and 2 Rail Safety Workers, Category 3 Around The Track Personnel
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# 1 Executive Summary

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Rail operators must manage the risks posed to the safe operation of the network by the health conditions of their employees. The *National Standard for Health Assessment of Rail Safety Workers* (the Standard) provides a common, evidence-based framework and benchmark for rail operators to manage those risks.

As part of an ongoing maintenance program, the National Transport Commission (NTC) reviews the Standard to ensure that it is current and up to date, and reflects the needs for the safe working environment of the Australian rail industry.

During the last update, some stakeholders sought significant changes to two specific areas of health assessment:

- **Issue 1: Sleep disorders** – The current trigger for testing Rail Safety Workers (RSWs) for obstructive sleep apnoea (OSA) is based on Body Mass Index (BMI) and co-morbidities such as type 2 diabetes and hypertension. Some stakeholders argue that the current triggers for OSA testing are insufficient, and allow many cases of OSA to go undetected.
- **Issue 2: Category 3 health assessments** – The health assessment for Category 3 Around The Track Personnel (ATTP) covers hearing, vision and musculoskeletal function.<sup>1</sup> Some stakeholders argue the assessments should be expanded to include additional medical conditions that could affect a worker's safety around the track, particularly those conditions that may lead to a sudden incapacity or cognitive impairment. In May 2016, it was agreed that revisions to the forms and text should be the first step in addressing any inconsistency. The forms were updated by the NTC in 2017. Members of the reference group also agreed that more information should be provided in Authorised Health Professional (AHP) training to clarify other conditions that may impact on safety around the track for Category 3 ATTP.<sup>2</sup>

The proposed changes to the health assessment criteria would have significant impacts for RSWs, their employers and health professionals. The cost of implementing the proposed changes – or something like them – must be balanced against the safety benefits that can be associated with them.

In December 2017, the NTC released a [discussion paper](#) outlining the current requirements and potential options to change the Standard, and sought supporting evidence from stakeholders to help develop a robust case for making a change or otherwise.

This report outlines the feedback and evidence provided by stakeholders in response to the discussion paper. Based on the feedback provided by stakeholders and the absence of robust evidence, the NTC is of the view that changes to the Standard are not warranted. The NTC believes there is however, a case for further research to be undertaken by appropriate bodies and recommends:

**Recommendation 1:** The NTC recommends further research is undertaken by relevant field experts, such as the Cooperative Research Centre for Alertness, Safety and Productivity (Alertness CRC) in consultation with the Chief Medical Officers Council, to quantify and describe the risk of undiagnosed obstructive sleep apnoea based on other screening criteria.

**Timeframe:** report progress and findings to the NTC by June 2019.

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<sup>1</sup> Around the track personnel (ATTP) are workers who perform Non-Safety Critical tasks on or near the track.

<sup>2</sup> An Authorised Health Professional (AHP) is a health professional who has been selected by a rail transport operator, on the basis of their compliance with the specified selection criteria, to perform rail safety worker health assessments.

**Recommendation 2:** The NTC recommends further research is undertaken by relevant field experts, such as the Chief Medical Officers Council in consultation with industry, to quantify and describe the risk to Category 3 ATTP of medical or health conditions not covered by the Standard or other regulatory regimes.

**Timeframe:** report progress and findings to the NTC by June 2019.

**Recommendation 3:** The NTC recommends that education and training materials are developed by relevant field experts, such as the Chief Medical Officers Council, and communicated to Authorised Health Professionals and other industry bodies to clarify the assessment and referral criteria required for Category 3 ATTP, with emphasis on the conditions listed in the Category 3 health questionnaire but not specifically covered in the Category 3 standard.

**Timeframe:** report progress and findings to the NTC by June 2019.

## 2 Consultation

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### 2.1 Feedback overview

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Over the 12 week consultation period, stakeholders provided feedback on the discussion paper through formal submissions on the NTC website and by email. Rail operators, health professionals, unions and peak bodies provided 11 submissions in response to the two issues. Details of this feedback are presented in tables 1 and 2 in Appendix A.

#### 2.1.1 Issue 1: Sleep disorders

The NTC received four submissions in support of changing the sleep disorder criteria and six submissions in support of maintaining the current sleep disorder criteria.

##### **In support of changing the sleep disorder criteria**

A rail operator submitted that there is a case for expanding the current sleep disorder criteria in the Standard on the grounds that there have been numerous rail accidents in the United States (US) linked to undiagnosed or untreated OSA. The details of these accidents are presented in Appendix B.

A health professional submitted that they support changes to the Standard to reflect the neck circumference screening criteria adopted by the Civil Aviation Safety Authority (CASA) for Class 1 pilots (neck circumference  $\geq 42$  cm (male) /  $\geq 40$  cm (female)).

A health professional submitted that they support changes to the Standard to include the neck circumference criteria used in the STOP-BANG<sup>3</sup> questionnaire as an additional risk factor for RSWs with a BMI  $\geq 35$  (neck circumference  $\geq 43$  cm (male) /  $\geq 41$  cm (female)).

A health professional also submitted that they support expanding the current screening criteria to include the STOP-BANG questionnaire and Mallampati Classification.

##### **In support of maintaining the current sleep disorder criteria**

Several rail operators, unions and peak bodies submitted that they were unable to locate sufficient evidence to support the proposed changes to the Standard. These stakeholders were of the view that such changes to the Standard would have significant cost implications and were not warranted. For example, one rail operator estimated the proposed changes would result in additional costs of \$150,000 for initial sleep studies.

A rail operator provided data in their submission that indicated if the proposed changes were implemented an additional 70 (6.4%) workers would require screening (a 55% increase in sleep studies). Another rail operator advised that changes to the Standard would require an additional 233 (11.3%) workers be screened (a 150% increase in sleep studies). Submissions advised that a change to the criteria would also result in higher demand for specialist services which are limited and not readily available in regional areas. However, other submissions did not agree and advised that most sleep studies are completed in the home using portable devices.

Those who submitted there is no case for expanding the current sleep disorder criteria agreed that if and when evidence emerges, then further review and update of the Standard may be required.

##### **Proposed options**

The submissions provided five potential options for changes to the Standard. These are:

1. Amend the criteria to include BMI  $\geq 35$  and no co-morbidities
2. Amend the criteria to include neck circumference from CASA standard

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<sup>3</sup> The STOP BANG questionnaire is a tool used to screen for low, moderate or high risk in OSA.

3. Amend the criteria to include neck circumference from STOP-BANG questionnaire
4. Amend the criteria to include STOP-BANG questionnaire and Mallampati Classification
5. Maintain the current screening criteria, and management and treatment regime.

### **2.1.2 Issue 2: Category 3 ATTP health assessments**

The NTC received three submissions in support of changing the Category 3 ATTP health assessments and three submissions in support of maintaining the current criteria.

#### **In support of changing the Category 3 ATTP health assessments**

A rail operator submitted that there is a case for expanding Category 3 ATTP health assessments as the current Standard does not list what other conditions may affect track safety and this may result in AHPs making subjective and inconsistent decisions regarding worker fitness. A rail operator noted the proposed expanded Category 3 Standard does not mandate additional tests, but would require AHPs to seek further information from treating doctors. A rail operator advised that although there is no data available on the rate of incidents, there have been episodes of ill health in the rail corridor affecting Category 3 ATTP that could have led to accident or injury of workers.

A health professional submitted that there is a case for expanding Category 3 ATTP health assessments to improve the specificity of assessments to the job demands, work environments and associated health risks and therefore, the sensitivity of assessment outcomes to those risks and work abilities.

A health professional also submitted the Category 3 ATTP health assessment criteria could be expanded to combine discrete job-specific evaluations of physical ability and cardiovascular health and recent history of musculoskeletal injury/pain.

#### **In support of maintaining the Category 3 ATTP health assessments**

Submissions in support of maintaining the Category 3 ATTP health assessments advised that in the absence of evidence and data indicating a significant number of deaths or injuries of individuals due to their incapacitation in the face of uncontrolled risks, it is difficult to justify regulatory intervention.

A rail operator submitted evidence that between January 2013 and January 2018 there were 34 health related incidents involving Category 3 ATTP. Of these incidents, 10 occurred on or near the track and none involved an interface with moving rolling stock or near misses. Furthermore, submissions advised that Category 3 ATTP are never in the rail corridor or danger zone on their own and are always in the company of a protection officer. While some stakeholders advised Category 3 ATTP are never in the rail corridor, other submissions advised that Category 3 ATTP may be required to cross rail tracks to get from the station or car park to their workplace and are never accompanied.

Submissions suggested that there should be no difference in the regulatory approach to non-safety critical workers across industries. For example, it was noted that WHS legislation, which applies to all industries including rail, should be the arena in which to address the personal risk arising from health conditions for non-safety critical workers.

Submissions outlined that changes to health assessments would impose additional costs on the organisation without any real risk exposure reduction based on the activities being undertaken. However, this was not the universal view of stakeholders with some submissions advising that the proposed changes would not impose extra tests or investigations, rather the AHP would be directed to obtain more information about certain health conditions from the worker's GP.

Submissions proposed using lesser forms of intervention, including education and awareness campaigns, before choosing to mandate particular requirements in the law or supporting regulations.

## **Proposed options**

The submissions provided three potential options for changes to the Standard. These are:

1. Amend the Category 3 ATTP health questionnaire to include discrete job-specific evaluations of physical ability and cardiovascular health and recent history of musculoskeletal injury/pain
2. Amend the Category 3 ATTP health assessment criteria to require AHPs to seek further information from treating doctors on additional conditions
3. Maintain the current Category 3 ATTP assessment criteria.

# 3 Conclusions

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## 3.1 Conclusions

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### Issue 1: Sleep disorders

As outlined earlier, several rail operators, unions and peak bodies submitted that they were unable to locate sufficient evidence to support the proposed changes to the Standard.

The additional evidence that was put forward in a submission was limited to rail accidents in the US. The US does not have a Rail Medical Standard or testing rules in place for OSA in rail engineers; railroad engineers are only required to meet criteria around vision and hearing. Based on known clinical factors and the findings provided in the National Transportation Safety Board (NTSB) reports, four of the nine engineers involved in the accidents would have been screened for OSA under the current Standard; two of the nine engineers would not have been screened under the current Standard; and further information is required to determine whether three of the nine engineers would have been screened under the current Standard.

### Issue 2: Category 3 ATTP health assessments

As outlined above, several submissions advised that in the absence of evidence and data indicating a significant number of deaths or injuries of individuals due to their incapacitation in the face of uncontrolled risks, it is difficult to justify regulatory intervention.

Stakeholders who submitted that there is a case for expanding Category 3 ATTP health assessments did not provide evidence that the current criteria has led to accidents or injuries in the rail corridor. The grounds for expanding Category 3 ATTP health assessments were based on developing a consistent and job-specific assessment process. The only additional assessment that was raised by a stakeholder involved evaluating cardiovascular health and recent history of musculoskeletal injury/pain.

## 3.2 Recommendations

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Based on the feedback provided by stakeholders and the absence of robust evidence, the NTC is of the view that changes to the Standard are not warranted. The NTC believes there is however, a case for further research to be undertaken by appropriate bodies.

**A case has been made for more research, not more regulation.**

**Recommendation 1:** The NTC recommends further research is undertaken by relevant field experts, such as the Cooperative Research Centre for Alertness, Safety and Productivity (Alertness CRC) in consultation with the Chief Medical Officers Council, to quantify and describe the risk of undiagnosed obstructive sleep apnoea based on other screening criteria.

**Timeframe:** report progress and findings to the NTC by June 2019.

**Recommendation 2:** The NTC recommends further research is undertaken by relevant field experts, such as the Chief Medical Officers Council in consultation with industry, to quantify and describe the risk to Category 3 ATTP of medical or health conditions not covered by the Standard or other regulatory regimes.

**Timeframe:** report progress and findings to the NTC by June 2019.

**Recommendation 3:** The NTC recommends that education and training materials are developed by relevant field experts, such as the Chief Medical Officers Council, and communicated to Authorised Health Professionals and other industry bodies to clarify the assessment and referral criteria required for Category 3 ATTP, with emphasis on the

conditions listed in the Category 3 health questionnaire but not specifically covered in the Category 3 standard.

**Timeframe:** report progress and findings to the NTC by June 2019.

# Appendix A Summary of feedback

Table 1. Issue 1: Sleep disorders

Submission topic	Feedback/evidence
<b>Evidence of risk of undiagnosed OSA in the rail environment</b>	[Rail operator] There have been numerous rail crashes in the USA caused by workers with undiagnosed OSA including: <ul style="list-style-type: none"> <li>• Clarkston, Michigan (2001) with 2 dead and 2 injured</li> <li>• Red Oak, Iowa (2011) with 2 dead</li> <li>• Chaffee, Missouri (2013) with 2 injured</li> <li>• Bronx, New York (2013) with 4 dead and 61 injured</li> <li>• Hoxie, Arkansas (2014) with 2 dead and 2 injured</li> <li>• Hoboken, New Jersey (2016) with 1 dead and 110 injured</li> <li>• Brooklyn, New York (2017) with 108 injured. <ul style="list-style-type: none"> <li>○ The engineer had a BMI 35-39.9 but no mention of pre-existing diabetes or hypertension, therefore would not have been detected using current Standard, but would have been detected using the proposed new criteria of BMI <math>\geq</math> 35.</li> </ul> </li> </ul>
	[Rail regulator] The Brooklyn accident, which injured 108 people, was caused by engineer fatigue resulting from undiagnosed severe OSA. The engineer would not have been tested for OSA in Australia under current medical criteria in the Standard, because his BMI was below 40 and he did not have type 2 diabetes or hypertension.
	[Industry group] Not aware of any adverse incidents that have occurred on tourist and heritage railways that could be attributed to the presence of OSA.
	[Rail operator] There is an absence of evidence to conclude that the Standard is not sufficient to deal with RSW health risks.
	[Rail operator] Analysis of incidents on the network between January 2015 and January 2018 indicated there were no reported incidents due to ill health of RSWs whilst performing safety critical duties. Specifically, investigations for all Signals Passed at Danger (SPADs) during this period did not indicate any of these incidents were the result of health issues.
	[Industry group] At this point, the [organisation] is not aware of any changes in technology, medical advancement or other changes or additional risks that would warrant any changes to the National Standard for Health Assessment of Rail Safety Workers (the Standard). If and when such changes come to light, then further review and update of the Standard may be required.
	[Rail operator] Based on there being no evidence demonstrating a link between health issues and safety incidents, together with the expected operational and financial impacts, we are not supportive of the proposed change to sleep disorder criteria for RSWs.
	[Rail operator] The current status quo is more than adequate to ensure a safe rail environment.
	[Rail operator] Since 2012, experience indicates that in most cases where workers have been diagnosed with severe OSA that treatment is well tolerated and that workers realise after commencing treatment that they feel better rested and less fatigued.
<b>Level of success in treating OSA</b>	
<b>Cost of OSA treatment and diagnosis</b>	[Rail operator] As with any pre-existing medical condition the cost of treatment is borne by the patient, not the rail operator. The Standard permits home tests which are not onerous and are considerably

Submission topic	Feedback/evidence
	<p>cheaper than studies performed at sleep laboratories. A home sleep test costs of the order of \$400-500, including specialist review of the result.</p> <p>[Health professional] A typical home sleep test costs in the range of \$400-550.</p> <p>[Industry group] The proposed changes would have significant cost implications for the voluntary rail sector. On the basis of the age and gender profile of volunteers, it is inevitable that a significant proportion will be assessed as requiring PSG monitoring. The cost of this will increase the price of the medical assessments by several orders of magnitude. Note: A submission from Australia's largest voluntary rail operator with over 200 Category 2 RSWs, advised that only two RSWs have required sleep studies since 2012. The submission stated that tourist and heritage workers are extremely motivated with regard to their health and the very physical nature of this work probably means there are fewer workers at risk of OSA compared with the paid rail workforce.</p> <p>[Rail operator] Current expenditure for sleep studies between January 2015 and January 2018 is \$100K; the proposed changes are estimated to cost an additional \$150K for initial sleep studies alone. Increased frequency of periodic assessments and ongoing sleep study testing. Identified RSWs would require annual health assessments. Additional cost of health assessments and ongoing sleep studies is estimated to be \$250K per annum.</p>
<b>Diagnosis time</b>	<p>[Health professional] Referrals for home sleep test can be accommodated within 3 to 4 days. Laboratory based studies often require a longer period, usually 2 to 3 weeks. Greatest delay is in the reporting and treatment phase, as it can take 3 to 5 weeks for treatment to be trialled and effectiveness demonstrated. This process can have negative consequences for the worker and for the employer. A set period should be established for workers to be able to perform their employed duties whilst undertaking the management for their OSA. This would reduce the impact for both parties during this period and provide an incentive for the work to address the matter promptly. Once the OSA risk is identified, then a 'fit subject to review' period should be applied. A flexible case-by-case basis would be sufficient to ensure for accurate diagnosis, consultation and treatment as required.</p> <p>[Rail operator] Change to the criteria would result in higher demand for specialist services which are limited and not readily available in regional areas. Delays in securing appointments, extended absences for the workplace to travel to and attend appointments and assessments would have operational and financial impacts on the organisation.</p>
<b>Number of additional workers screened under the proposed criteria</b>	<p>[Rail operator] Of a sample of 1093 workers, 126 (11%) would be tested under the current criteria. If the proposed changes were implemented, an additional 70 (6.4%) workers would require screening, a 55% increase in sleep studies.</p> <p>[Rail operator] Between January 2015 and January 2018, 155 (7.5%) workers were referred for sleep studies. If the proposed changes were implemented, an additional 233 (11.3%) workers would have been referred in the same period, a 150% increase in sleep studies.</p>
<b>Alternative approaches to managing OSA</b>	<p>[Rail operator] Have offered health promotion programs to employees for many years. Whilst these programs have been successful in improving various health risks in participants, the number of previously undiagnosed cases of OSA shows that such programs are not a substitute for screening.</p> <p>[Rail operator] No similar standard for drivers of trucks or buses set by the National Heavy Vehicle Regulator.</p>

Submission topic	Feedback/evidence
	<p>[Health professional] STOP-BANG criteria used as a screening tool. Interrogated data set of 503 patients.</p> <ul style="list-style-type: none"> <li>• or more risk factors (n=195), 174 diagnosed with OSA</li> <li>• 1 to 3 risk factors (n=284), 220 diagnosed with OSA</li> <li>• A STOP-BANG score of 4 or more 'YES' answers is considered sufficient to request a home-based sleep study or Sleep Medicine Specialist opinion.</li> </ul> <p>In addition to the STOP-BANG, use of the oropharyngeal appearance score of 'Mallampati class' could be another element to consider. Those with higher classes (III, IV) are at greater risk of severe OSA. This assessment is straightforward and can be assessed by a trained practitioner during a regular clinical consultation.</p>
	<p>[Rail operator] All RSWs are required to attend for periodic health assessments, however a triggered health assessment can be arranged at any time. Fatigue management policies and procedures are in place to monitor and manage hours of work of RSWs. These additional measures and tools further assist the business to manage the fitness of RSWs.</p>
<p><b>Proposed change to current criteria</b></p>	<p><b>1. BMI ≥ 35</b> A person is not Fit for Duty Unconditional: • if they are assessed as being at risk of sleep disorder, as evidenced by: • a history of loud snoring or of witnessed apnoeic events; or • BMI ≥ 35.</p> <p><b>2. Include neck circumference from CASA standard</b> A person is not Fit for Duty Unconditional: • if they are assessed as being at risk of sleep disorder, as evidenced by: • History of loud snoring or of witnessed apnoeic events; or • BMI &gt; 40 or • BMI ≥ 35 and either: — diabetes type 2; or — high blood pressure requiring 2 or more medications for control; or — neck circumference ≥ 42 cm (male) / ≥ 40 cm (female).</p> <p><b>3. Include neck circumference from STOP-BANG</b> A person is not Fit for Duty Unconditional: • if they are assessed as being at risk of sleep disorder, as evidenced by: • History of loud snoring or of witnessed apnoeic events; or • BMI &gt; 40 or • BMI ≥ 35 and either: — diabetes type 2; or — high blood pressure requiring 2 or more medications for control; or — neck circumference ≥ 43 cm (male) / ≥ 41 cm (female).</p> <p><b>4. Include STOP-BANG and Mallampati Classification</b> A person is not Fit for Duty Unconditional: • if they are assessed as being at risk of sleep disorder, as evidenced by: • History of loud snoring or of witnessed apnoeic events; or • BMI &gt; 40 or • BMI ≥ 35 and either: or — diabetes type 2; or — high blood pressure requiring 2 or more medications for control. • Score of 4 or more in the STOP-BANG questionnaire, or • Mallampati Classification of III or more.</p> <p><b>5. No change</b> A person is not Fit for Duty Unconditional: • if they are assessed as being at risk of sleep disorder, as evidenced by: • History of loud snoring or of witnessed apnoeic events; or • BMI &gt; 40 or • BMI ≥ 35 and either: — diabetes type 2; or — high blood pressure requiring 2 or more medications for control.</p>

**Table 2. Issue 2: Category 3 ATTP health assessments**

Submission topic	Feedback/evidence
<b>Rate of incidents due to ill health of Category 3 ATTP</b>	<p>[Rail operator] Data is not available on the rate of incidents; however there have been episodes of ill health in the rail corridor affecting Category 3 ATTP that could have led to accident or injury of the worker. Epilepsy, psychiatric disorders, cognitive dysfunction, blackouts and drug and alcohol concerns have been a feature.</p>
	<p>[Rail operator] A review of incidents between January 2013 and January 2018 indicates there were 34 health related incidents reported involving Category 3 ATTP. Of these incidents, 10 occurred on or near the track and none involved an interface with moving rolling stock or near misses. Reports indicate leaders and team members took appropriate action to manage the safety and well-being of the individual and others for these incidents.</p>
	<p>[Rail operator] Have seen no evidence for any need to alter the current status quo and believes that the current regime of Category 3 testing is more than adequate to ensure a safe rail environment.</p>
<b>Cost of additional testing for Category 3 ATTP</b>	<p>[Rail operator] The proposed expanded Category 3 standard does not mandate additional tests. At most it would require AHPs to seek further information from treating doctors and this is something that should already be happening if AHPs are giving proper consideration to other conditions that the Standard recognises may affect track safety.</p>
	<p>[Rail operator] Impose additional cost to the organisation without any real risk exposure reduction based on the activities being undertaken.</p>
	<p>[Rail operator] Additional costs for basic Category 3 ATTP health assessments (currently \$235 each) plus costs for any subsequent additional testing. This additional cost would be variable based on the information required. For example, requests for simple reports from treating doctors alone can be up to \$400. Increased frequency of periodic health assessments would increase cost and operational resourcing impacts. Operational impact due to unavailability of employees when attending for additional testing and increased frequency of health assessments. Note: While submissions provided that simple reports from treating doctors can be up to \$400, other submissions suggested these costs were extreme.</p>
<b>Equivalent medical assessments in other industries</b>	<p>[Rail operator] NSW Coal Order 14 – employers of coal mine workers and operators must ensure that preplacement medical assessments and periodic health assessments are completed for their workforce. Periodic health assessments include the following and are more onerous than rail Category 3:</p> <ul style="list-style-type: none"> <li>• Medical, respiratory and musculoskeletal history</li> <li>• Spirometry</li> <li>• Vision and hearing assessments</li> <li>• Blood pressure, urinalysis, cholesterol, blood sugar and BMI</li> <li>• Cardiac risk assessment</li> <li>• Hazard exposure and work-related skin disease questionnaires</li> <li>• K10 questionnaire</li> <li>• Epworth sleepiness scale</li> <li>• AUDIT.</li> </ul> <p>Many similar occupations such as road maintenance or construction have full medical assessments similar to Category 2, but without the AUDIT, ESS or K10 questionnaires.</p>
	<p>[Health professional] Civil infrastructure – utilities have a Fitness for Work assessment program, including:</p> <ul style="list-style-type: none"> <li>• Completion and verification of job analyses and associated health</li> </ul>

Submission topic	Feedback/evidence
	<p>risks to establish the inherent requirements and demands, and</p> <ul style="list-style-type: none"> <li>• Pre-employment and periodic functional health assessments against the job analyses.</li> </ul>
<p><b>Supports changes to Category 3 ATTP medical assessment criteria</b></p>	<p>[Rail operator] The Standard acknowledges that other conditions may also affect track safety, but it does not clearly list what the Standard should apply for those conditions and this lack of guidance has the potential to lead to AHPs making subjective and inconsistent decisions regarding worker fitness. Category 1 and 2 standards are used by some AHPs as guides for Category 3 which runs the risk of Category 3 workers being treated more onerously than they should and incurring higher investigation costs than warranted. If the Standard expanded Category 3 criteria it would avoid AHPs erroneously applying higher Category 1 or 2 standards to Category 3 workers. It would help to limit costs incurred by rail transport operators and workers by specifying the lower health criteria that apply to Category 3. It would help to ensure consistent fitness decisions across Australia and the fair treatment of Category 3 workers.</p> <p>[Health professional] Propose any expansion of the Standard should be directed towards improving the specificity of assessments to the job demands, work environments and associated health risks and therefore, the sensitivity of assessment outcomes to those risks and work abilities. There is a case for expanding the health assessment criteria to combine discrete job-specific evaluations of physical ability and cardiovascular health (pulse rate, blood pressure) and recent history of musculoskeletal injury/pain. This approach has been adopted by organisations in related industries with similar job roles, demands and health risks. The Utility Organisation cohort is representative of current and prospective ATTP. That is ATTP are likely to:</p> <ul style="list-style-type: none"> <li>• Possess similar characteristics in terms of cardiovascular, metabolic and musculoskeletal health; and</li> <li>• Encounter similar health risks vis-à-vis the demands of the roles and the uncontrolled environments in which they are performed.</li> </ul> <p>[Rail operator] Although the health questionnaire asks about other conditions, there are no criteria for application of this information, and often AHPs are left to use their own discretion and can face strong push back from workers. Either:</p> <ul style="list-style-type: none"> <li>• There are no specific requirements for Category 3 workers in the Standard, and the onus would be on the employers to assess and determine the workers safety around the track based on their own risk-assessments, OR</li> <li>• The Category 3 Health Assessment expands to cover some medical conditions that could affect safety around the track, e.g. medical conditions that could lead to loss of consciousness.</li> </ul> <p>[Health professional] Health questionnaire revised to promote disclosure and improved specificity of responses Section 1, Medical History:</p> <ul style="list-style-type: none"> <li>• Prefaced with 'Have you ever had, or been told by a doctor or other health practitioner (e.g. physiotherapist) any of the following...'</li> <li>• Modify – '(traumatic) head/brain injury' rather than 'cognitive disorder or head injury'</li> <li>• Modify – 'Mental health condition' rather than 'psychiatric or psychological disorder'</li> <li>• For any positive response, applicant should be asked to describe the condition</li> <li>• Applicants should be asked to specify any recent history or musculoskeletal injury/pain (within the recent 12 months), including: <ul style="list-style-type: none"> <li>○ Neck/shoulder/arm pain</li> <li>○ Hand injury</li> <li>○ Low back pain</li> </ul> </li> </ul>

Submission topic	Feedback/evidence
	<ul style="list-style-type: none"> <li>○ Hip pain</li> <li>○ Knee pain</li> <li>○ Weakness and/or numbness in one or both legs</li> <li>● For any positive response, applicants should be asked to declare: <ul style="list-style-type: none"> <li>○ (i) whether or not they have received medical or related treatment for the condition</li> <li>○ (ii) whether or not it has affected or continues to affect their ability to work</li> </ul> </li> </ul> <p>Section 2, should be retained. Examination of general appearance, vision and hearing should be retained.</p> <ul style="list-style-type: none"> <li>● At a minimum, blood pressure management should be included and considered in concert with BMI and the findings from the Health questionnaire</li> </ul> <p>Musculoskeletal/neurological examination revised for job specificity</p> <ul style="list-style-type: none"> <li>● Having regard for the essential job demands, at a minimum the following should be examined: <ul style="list-style-type: none"> <li>○ Functional mobility without load to the required segmental and whole-body range</li> <li>○ Manual handling ability and technique spanning unilateral and bilateral lifting, carrying and transfers of the load and ranges required</li> <li>○ Repeated climbing and stair-treading</li> <li>○ Repeated and sustained squatting/crouching and kneeling.</li> </ul> </li> </ul>
<p><b>Does not support changes to Category 3 ATTP medical assessment criteria</b></p>	<p>[Industry group] Current testing is too onerous resulting in loss of workers for long periods of time during rectification of condition where the risk exposure from the work being undertaken provides a low risk but falls under Safety Critical work. Focus could be placed on improving the identification of rail tasks, the allocation of Critical and Non-Critical activities against those tasks and an industry standard to provide consistency in approach and allocation of medicals.</p>
	<p>[Rail operator] Category 3 ATTP are never in the rail corridor or danger zone on their own and always in the company of a protection officer. Protection officers are classified as Category 1 and therefore subject to testing for health conditions associated with increased risk of fatigue or incapacitation. Note: While some stakeholders advised Category 3 ATTP are never in the rail corridor, other stakeholders advised that Category 3 ATTP may be required to cross rail tracks to get from the station or car park to their workplace and are never accompanied. There should be no difference in the regulatory approach to non-safety critical workers across various industries. It is suggested that WHS legislation, which applies to all industries including rail, should be the arena in which to address the personal risk arising from health conditions for non-safety critical workers. Under the law, RSWs have a duty to take reasonable care of their own safety and ensure that their acts or omissions do not adversely affect the safety of others. Personal health is subject to self-reporting. Note: Although RSWs have a duty to self-report, some submissions advised that RSWs are motivated to almost never self-disclose health conditions to their employer for fear of restrictions being placed on them. Lesser forms of intervention, including education and awareness campaigns should be considered before choosing to mandate particular requirements in the law or supporting regulations.</p>
	<p>[Industry group] There does not appear to be sufficient evidence of risks to rail safety to conclude that health assessments for Category 3 ATTP should be expanded</p>
	<p>[Rail operator] In the absence of data indicating a significant number of deaths or injuries of individuals due to their incapacitation in the face of uncontrolled risks, it is difficult to justify regulatory intervention.</p>

Submission topic	Feedback/evidence
	<p>[Rail operator]</p> <p>It is important to note that Category 3 ATTP health assessments are a secondary or additional component of managing the risk of employees' exposure to moving rolling stock.</p> <p>An increase in medical criteria for Category 3 ATTP may blur the categorisation of Safety Critical Workers and non-Safety Critical Workers as detailed in the current version of the Standard. Consideration of the intent and definition of Safety Critical Work and non-Safety Critical Work in the context of the Standard may need to be addressed. This in itself could result in significant rework of the Standard and subsequent impact on rail operators.</p> <p>Based on current information, there is no evidence to demonstrate that expanding the testing criteria for Category 3 ATTP would improve the safety of these workers whilst working in or around the network. The cost of implementing the proposed changes does not appear to be balanced with any associated safety benefits.</p>

# Appendix B Further supporting analysis on rail accidents linked to OSA

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## B.1 Rail OSA accidents – United States

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During the consultation process, a stakeholder provided details in their submission on several rail accidents linked to OSA in the United States (US), including:

- Clarkston, Michigan
- Kelso, Washington
- Newton, Massachusetts
- Red Oak, Iowa
- Chaffee, Missouri
- Bronx, New York
- Hoxie, Arkansas
- Hoboken, New Jersey, and
- Brooklyn, New York.

The following section provides a summary of each accident and whether, based on known clinical factors, the crewmember would have been screened under the current Standard; the proposed standard of BMI  $\geq 35$  or the STOP-BANG questionnaire.

### B.1.1 Clarkston, Michigan (2001)

In 2001, two trains collided near Clarkston, Michigan killing two crewmembers and injuring two crewmembers. No evidence was found that the train engineer made any control manoeuvres in response to the stop indication, such as applying the brakes, during the last two minutes before the accident.<sup>4</sup>

The engineer had high blood pressure and diabetes that were being treated with prescription medications.<sup>5</sup> Private physician medical records indicated the engineer likely suffered from OSA and had been advised to undergo further evaluation and learn about treatment options. The engineer did not seek additional medical treatment for this condition.<sup>6</sup>

The conductor advised he had been referred to a sleep clinic by his personal physician where he was diagnosed with OSA.<sup>7</sup> He had been using a Continuous Positive Airway Pressure (CPAP) device to treat his condition but had not returned to the clinic to determine if treatment was working. The conductor had type 2 diabetes, but did not reveal his OSA diagnosis to his employer.<sup>8</sup>

The US National Transportation Safety Board (NTSB) determined the probable cause of the accident was the crewmembers' fatigue, which was primarily due to the engineer's untreated and the conductor's insufficiently treated OSA.<sup>9</sup>

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<sup>4</sup> National Transportation Safety Board, 2001, *Railroad Accident Report*, p. 2, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAR0204.pdf>>.

<sup>5</sup> Ibid., p. 5.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid., p. 6.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid., p. 27.

As the report does not provide the BMI of the engineer or conductor, further information is required to determine whether the engineer would have been screened for OSA under the current Standard; the proposed standard of BMI  $\geq 35$  or the STOP-BANG questionnaire.

**Table 3. Clarkston, Michigan clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	?	?	Yes	Yes	Yes

### B.1.2 Kelso, Washington (2003)

In 2003, two trains collided near Kelso, Washington injuring two drivers. The NTSB described the engineer as significantly obese and had been diagnosed with moderate to severe OSA two years before the accident and was using a CPAP device to treat the condition.<sup>10</sup> However, the device was never properly adjusted to establish a therapeutic air pressure level and was ineffective in treating the condition.<sup>11</sup> The NTSB found that as the engineer's sleep disorder was not being effectively treated this would have caused a long-term sleep debt to accumulate.<sup>12</sup> The NTSB determined the probable cause of the accident was the crewmembers' neglect of the information conveyed by the wayside signal system because they were asleep.<sup>13</sup> The NTSB concluded the engineer's and conductor's respective health conditions in combination with irregular work schedules contributed to the accident.<sup>14</sup> It is likely that the engineer would have been screened for OSA under the current Standard and the proposed standard of BMI  $\geq 35$  and would have been required to report on compliance and effectiveness of CPAP treatment. Further information is required to determine whether the engineer would have been screened under the STOP-BANG questionnaire.

**Table 4. Kelso, Washington clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	?	> 35	Yes	?	Yes

### B.1.3 Newton, Massachusetts (2008)

In 2008, two trains collided in Newton, Massachusetts killing one driver and injuring eight people.<sup>15</sup> The NTSB reported that the engineer was a 24 year old woman with a BMI of 38.6 kg/m<sup>2</sup>.<sup>16</sup> The NTSB found that the engineer was at high risk of having undiagnosed OSA and may have been chronically fatigued as a result of the condition.<sup>17</sup> The NTSB determined the probable cause of the accident was the failure of the operator of the striking train to comply with the controlling signal indication, likely as a result of becoming disengaged from her environment consistent with experiencing an episode of micro-sleep.<sup>18</sup> As a result of the

<sup>10</sup> National Transportation Safety Board, 2003, *Railroad Accident Brief*, p. 5, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAB0503.pdf>>.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid., p. 8.

<sup>14</sup> Ibid.

<sup>15</sup> National Transportation Safety Board, 2009, *Railroad Accident Report*, p. 4, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAR0902.pdf>>.

<sup>16</sup> Ibid., p. 26.

<sup>17</sup> Ibid., p. 27.

<sup>18</sup> Ibid., p. 33.

investigation, the NTSB issued a safety recommendation to US rail operators to ensure they screened all drivers for OSA.<sup>19</sup>

It is not known whether the engineer had diabetes or hypertension. If the engineer did have diabetes and/or hypertension, based on the BMI and co-morbidities the engineer would have been screened for OSA under the current Standard and the proposed standard of BMI  $\geq 35$ . Based on the BMI of the engineer, they would have been screened under the proposed standard of BMI  $\geq 35$ . Further information is required to determine whether the engineer would have been screened under the STOP-BANG questionnaire.

**Table 5. Newton, Massachusetts clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Female	24	38.6	?	?	?

### B.1.4 Red Oak, Iowa (2011)

In 2011, two trains collided near Red Oak, Iowa killing two crewmembers, an engineer and a conductor.<sup>20</sup>

The engineer’s medical records stated he was 48 years old with a BMI of 35.7 kg/m<sup>2</sup> and had type 2 diabetes and high blood pressure, which was being treated with medication, but he had not undergone a sleep study.<sup>21</sup>

The conductor’s medical records stated she was 48 years old with a BMI of 37.6 kg/m<sup>2</sup>, was taking medication for high blood pressure and had not undergone a sleep study.<sup>22</sup>

The NTSB concluded that based on their medical histories, both crewmembers on the striking coal train were at high risk for OSA and fatigue.<sup>23</sup> The NTSB determined the probable cause of the accident was the failure of the crew of the striking train to comply with the signal indication because they had fallen asleep due to fatigue resulting from their irregular work schedules and their medical conditions, in addition to the absence of a positive train control system and absence of crashworthiness standards for modular locomotive crew cabs.<sup>24</sup>

Based on the BMI and co-morbidities (type 2 diabetes and high blood pressure) of the crewmembers, they would have been screened for OSA under the current Standard; the proposed standard of BMI  $\geq 35$  and the STOP-BANG questionnaire.

**Table 6. Red Oak, Iowa clinical factors – Conductor**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Female	48	37.6	Yes	No	?

<sup>19</sup> Ibid.

<sup>20</sup> National Transportation Safety Board, 2011, *Railroad Accident Report*, p. 9, <<https://www.ntsb.gov/investigations/AccidentReports/Reports/RAR1202.pdf>>.

<sup>21</sup> Ibid., p. 43.

<sup>22</sup> Ibid., p. 25.

<sup>23</sup> Ibid., p. 44.

<sup>24</sup> Ibid., p. 72.

**Table 7. Red Oak, Iowa clinical factors – Engineer**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	48	35.7	Yes	Yes	?

### **B.1.5 Chaffee, Missouri (2013)**

In 2013, two freight trains collided near Chaffee, Missouri injuring two crewmembers. The conductor had a BMI of 30.42 kg/m<sup>2</sup> and was found to have no medical problems that would have interfered with the safe operation of the train.<sup>25</sup>

The engineer was 58 years old with a BMI of 35.06 kg/m<sup>2</sup> and type 2 diabetes.<sup>26</sup> After the accident, the NTSB requested the engineer undergo voluntary testing for OSA, however the engineer did not comply and no sleep study was performed.<sup>27</sup>

The NTSB found that based on the engineer's presentation of risk factors for OSA, it was likely they had undiagnosed OSA at the time of the accident, and this likely resulted in fatigue that contributed to the accident.<sup>28</sup> The NTSB determined the factors which contributed to the accident included a lack of: positive train control system, medical screening requirements for OSA and action by the Federal Railroad Administration to fully implement the fatigue management components required by the Rail Safety Improvement Act of 2008.<sup>29</sup>

Based on the BMI and co-morbidities (type 2 diabetes) of the engineer, they would have been screened for OSA under the current Standard; the proposed standard of BMI ≥ 35 and the STOP-BANG questionnaire.

**Table 8. Chaffee, Missouri clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	58	35.06	No	Yes	?

### **B.1.6 Bronx, New York (2013)**

In 2013, a commuter train derailed in Bronx, New York killing four passengers and injuring 61 passengers. The train was travelling at 82 mph when it derailed in a section of curved track where the maximum authorised speed was 30 mph. The NTSB reported that the engineer was 46 years old with a BMI of 36.4 kg/m<sup>2</sup>.<sup>30</sup> The NTSB reported that the probable cause of the accident was the engineer's noncompliance with the 30 mph speed restriction because he had fallen asleep due to undiagnosed severe OSA.<sup>31</sup> Following the incident, the

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<sup>25</sup> National Transportation Safety Board, 2013, *Railroad Accident Report*, p. 26, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAR1402.pdf>>.

<sup>26</sup> Ibid., p. 15.

<sup>27</sup> Ibid., p. 16.

<sup>28</sup> Ibid., p. 29.

<sup>29</sup> Ibid., p. 42.

<sup>30</sup> National Transportation Safety Board, 2013, *Railroad Accident Report*, p. 3, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAB1412.pdf>>.

<sup>31</sup> Ibid., p. 5.

engineer underwent a sleep study and was diagnosed with severe OSA.<sup>32</sup> After the incident Metro-North examined 320 engineers and found that approximately 18% had OSA.<sup>33</sup>

It is not known whether the engineer had diabetes or hypertension. If the engineer did have diabetes and/or hypertension, based on the BMI and co-morbidities the engineer would have been screened for OSA under the current Standard and the proposed standard of BMI  $\geq$  35. Based on the BMI of the engineer, they would have been screened under the proposed standard of BMI  $\geq$  35. Further information is required to determine whether the engineer would have been screened under the STOP-BANG questionnaire.

**Table 9. Bronx, New York clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	46	36.4	?	?	Yes

### B.1.7 Hoxie, Arkansas (2014)

In 2014, two freight trains collided in Hoxie, Arkansas killing two crewmembers and injuring two crewmembers. The southbound engineer had a BMI of 31.2 kg/m<sup>2</sup> and did not suffer from any other medical conditions.<sup>34</sup> His medical records included a diagnosis of moderate OSA; however he had never obtained or used a CPAP machine to treat his sleep disorder.<sup>35</sup>

The NTSB concluded the southbound engineer was fatigued and likely asleep due to his diagnosed but inadequately treated moderate sleep apnea and operating the train in the early morning hours when he was predisposed to sleep.<sup>36</sup> The NTSB stated that additional contributing factors included: lack of a functioning positive train control system, the use of an automatic horn sequencer that, when activated, negated the operation of an electronic alertness device, the Federal Railroad Administration's failure to promulgate rules regarding sleep disorders and the absence of federal regulations requiring freight railroads to use fatigue modelling tools for train crew work schedules.<sup>37</sup>

Based on the BMI and absence of co-morbidities, the engineer would not have been screened for OSA under the current Standard; the proposed standard of BMI  $\geq$  35 or the STOP-BANG questionnaire.

**Table 10. Hoxie, Arkansas clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	?	31.2	No	No	Yes

### B.1.8 Hoboken, New Jersey (2016)

In 2016, a commuter train crashed at Hoboken Terminal in New Jersey killing one person and injuring 114 passengers. The NTSB found that 38 seconds prior to the crash, the train's engineer accelerated from 8 mph and was travelling at 21 mph on impact. The NTSB

<sup>32</sup> Federal Register Notices, 2016, *Safety Advisory*, vol. 81, no. 233, p. 87650, <<https://www.apta.com/gap/fedreg/Documents/Safety%20Advisory%202016%E2%80%93303.pdf>>.

<sup>33</sup> Halsey, A, 2016, *U.S. proposes sleep apnea testing to make roads and rail safer*, The Washington Post, 9 March 2016.

<sup>34</sup> National Transportation Safety Board, 2014, *Railroad Accident Report*, p. 14, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAR1603.pdf>>.

<sup>35</sup> *Ibid.*, p. 13.

<sup>36</sup> *Ibid.*, p. 27.

<sup>37</sup> *Ibid.*

reported that the engineer was 48 years old with a BMI of 43.67 kg/m<sup>2</sup>.<sup>38</sup> It is not known whether the engineer had diabetes or hypertension. The NTSB reported that the probable cause of the accident was the failure of the engineer to stop the train due to the engineer's fatigue resulting from his undiagnosed OSA.<sup>39</sup>

Following the incident, the engineer was diagnosed with severe OSA.<sup>40</sup> After the incident, New Jersey Transit examined 190 of its 397 engineers for OSA, with 18 testing positive for OSA.<sup>41</sup> New Jersey Transit also screened 168 of its 1,051 conductors for OSA, with 23 testing positive for OSA.<sup>42</sup>

Based on the BMI of the engineer, they would have been screened for OSA under the current Standard; the proposed standard of BMI ≥ 35 and the STOP-BANG questionnaire.

**Table 11. Hoboken, New Jersey clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	48	43.67	?	?	Yes

### B.1.9 Brooklyn, New York (2017)

In 2017, a commuter train collided with the platform at Atlantic Terminal in Brooklyn, New York injuring 108 passengers. The 50 year old engineer had a BMI of 39.5 kg/m<sup>2</sup> and neck circumference of 18.5 inches.<sup>43</sup> The engineer did not have co-morbidities such as type 2 diabetes or high blood pressure. After the incident, a sleep study was conducted and diagnosed the engineer with severe OSA and prescribed a CPAP device.

The NTSB determined the probable cause of the accident was that the engineer fell asleep due to his chronic fatigue.<sup>44</sup> Contributing to his chronic fatigue was the engineer's undiagnosed severe OSA and the Long Island Rail Road's failure to initiate OSA screening for safety-sensitive personnel and refer at-risk safety-sensitive personnel for definitive OSA testing and treatment before the accident.<sup>45</sup>

Based on the BMI and absence of co-morbidities, the engineer would not have been screened for OSA under the current Standard. However, the engineer would have been screened for OSA under the proposed standard of BMI ≥ 35 and the STOP-BANG questionnaire.

**Table 12. Brooklyn, New York clinical factors**

Gender	Age	BMI	Hypertension	Type 2 diabetes	OSA diagnosis
Male	50	39.5	No	No	Yes

<sup>38</sup> National Transportation Safety Board, 2016, *Railroad Accident Brief*, p. 5, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAB1801.pdf>>.

<sup>39</sup> *Ibid.*, p. 8.

<sup>40</sup> *Ibid.*

<sup>41</sup> Grayce West, M, 2017, *NJ Transit Tests Only Some Staff for Sleep Apnea*, Wall Street Journal, 13 April 2017.

<sup>42</sup> National Transportation Safety Board, 2016, *Railroad Accident Brief*, p. 5, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAB1801.pdf>>.

<sup>43</sup> National Transportation Safety Board, 2017, *Railroad Accident Report*, p. 6, <<https://www.nts.gov/investigations/AccidentReports/Reports/RAB1802.pdf>>.

<sup>44</sup> *Ibid.*, p. 9.

<sup>45</sup> *Ibid.*

### B.1.10 Comparison of accidents against different screening criteria

The below table provides a comparison of known clinical factors for each accident against the screening criteria under the current Standard; the proposed standard of BMI  $\geq$  35 and the STOP-BANG questionnaire.

Based on known clinical factors and the findings provided in the NTSB reports the following assumptions can be made.

- **Would have been screened:** Under the current Standard the Kelso, Red Oak, Chaffee and Hoboken engineers would have been screened for OSA; under the proposed standard of BMI  $\geq$  35 the Kelso, Newton, Red Oak, Chaffee, Bronx, Hoboken and Brooklyn engineers would have been screened; and under the STOP-BANG questionnaire the Red Oak, Chaffee, Hoboken and Brooklyn engineers would have been screened.
- **Would not have been screened:** Under the current Standard the Hoxie and Brooklyn engineers would not have been screened for OSA; and under the proposed Standard of BMI  $\geq$  35 and STOP-BANG questionnaire the Hoxie engineer would not have been screened.
- **Further information required:** Under the current Standard further information is required to determine whether the Clarkston, Newton and Bronx engineers would have been screened; under the proposed Standard of BMI  $\geq$  35 further information is required to determine whether the Clarkston engineer would have been screened; and under the STOP-BANG questionnaire further information is required to determine whether the Clarkston, Kelso, Newton and Bronx engineers would have been screened.

**Table 13. Comparison of accidents against different screening criteria**

Accident	Screening Criteria								
	Current criteria			Proposed criteria BMI ≥ 35			STOP-BANG questionnaire		
	Would have been screened for OSA	Would not have been screened for OSA	Further information required	Would have been screened for OSA	Would not have been screened for OSA	Further information required	Would have been screened for OSA	Would not have been screened for OSA	Further information required
Clarkston, Michigan (2001)			?			?			?
Kelso, Washington (2003)	✓			✓					?
Newton, Massachusetts (2008)			?	✓					?
Red Oak, Iowa (2011)	✓			✓			✓		
Chaffee, Missouri (2013)	✓			✓			✓		
Bronx, New York (2013)			?	✓					?
Hoxie, Arkansas (2014)		✗			✗			✗	
Hoboken, New Jersey (2016)	✓			✓			✓		
Brooklyn, New York (2017)		✗		✓			✓		

## B.2 Comparison of Australia and the United States screening criteria for OSA

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### B.2.1 Context of Australia and the US

Under the Australian Standard rail operators must manage the risks posed to the safe operation of the network by the health conditions of their employees, which includes assessing and meeting a number of health and medical criteria.

Unlike Australia, the US does not have a Rail Medical Standard or testing rules in place for OSA in rail workers. Under Part 240.121 of Title 49 of the *Code of Federal Regulations*, railroad engineers are only required to meet criteria around vision and hearing.<sup>46</sup> Federal regulations do not require railroad engineers or conductors to report a medical history, describe their use of medications, or undergo any other physical examination, additional testing or review of their health.

In 2016, following a number of road and rail accidents the US Federal Motor Carrier Safety Administration and Federal Railroad Administration announced a proposal to require bus drivers, truck drivers and rail workers to be tested for OSA.<sup>47</sup> The agencies opened a 90-day comment period that included public fact-gathering sessions in Washington, Chicago and Los Angeles. However, in August 2017 the Federal Motor Carrier Safety Administration and Federal Railroad Administration announced they had withdrawn their proposal and placed the onus on individual companies to decide how and when to test their employees for OSA.<sup>48</sup>

Individual rail operators have developed their own OSA testing criteria in response to accidents and fatalities on their network. For example, in 2017 the Metropolitan Transportation Authority (MTA) in New York announced a \$7.5 million contract to test crewmembers on subways, buses and commuter rail roads for OSA (approximately 20,000 employees).<sup>49</sup> The screening criteria adopted by the MTA involves an evaluation of an employee's BMI, neck circumference and a medical questionnaire related to sleep and sleep patterns, as well as relevant medical history.<sup>50</sup> The MTA's screening criteria for OSA includes the following:<sup>51</sup>

- ESS score of > 11
- Positive answer to a sleep related question
- BMI > 35 AND neck circumference > 17" for men or 16" for women; OR
- BMI > 35 OR neck circumference > 17" for men or 16" for women, plus any of the following:
  - Loud snoring
  - Observed apnoeas
  - Diagnosed hypertension requiring medication, or
  - Diagnosed diabetes or glucose intolerance.

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<sup>46</sup> Code of Federal Regulations, 2017, *Part 240.121*, p. 1034, <<https://www.gpo.gov/fdsys/pkg/CFR-2017-title49-vol4/pdf/CFR-2017-title49-vol4-part240.pdf>>.

<sup>47</sup> Department of Transportation, 2016, *Federal Register: Evaluation of Safety Sensitive Personnel for Moderate-to-Severe Obstructive Sleep Apnoea*, <<https://www.gpo.gov/fdsys/pkg/FR-2016-03-10/pdf/2016-05396.pdf>>.

<sup>48</sup> Department of Transportation, 2017, *FMCSA and FRA withdraw advance notice of proposed rulemaking on obstructive sleep apnea among commercial motor vehicle drivers and rail workers*, <<https://s3.amazonaws.com/public-inspection.federalregister.gov/2017-16451.pdf>>.

<sup>49</sup> Metropolitan Transportation Authority, 2017, *MTA expands sleep apnoea program system wide; becomes first public transportation agency to offer specialized screening, treatment for the disorder*, <<http://www.mta.info/news/2017/01/23/mta-expands-sleep-apnea-program-systemwide-becomes-first-public-transportation>>.

<sup>50</sup> National Transportation Safety Board, 2017, *Medical Factual Report*, pp. 18-25, <<https://dms.nts.gov/public/60000-60499/60326/608045.pdf>>.

<sup>51</sup> *Ibid.*, p. 19.

## B.2.2 Comparison of US and Australian rail operators

A comparison of the US and Australian rail environments has been undertaken to understand the similarities and differences between rail operators.

The MTA in New York services a population of 20.2 million, employs over 50,000 people and has an average weekday ridership of 7.7 million. There have been three rail accidents in the New York area linked to OSA.<sup>52</sup>

The Massachusetts Bay Transportation Authority (MBTA) in Massachusetts services a population of 6.86 million, employs 6,346 people and has an average weekday ridership of over 800,000. There has been one rail accident in Massachusetts linked to OSA.<sup>53</sup>

Sydney Trains services a population of 5.37 million in Sydney, employs around 10,000 people and has an average weekday ridership of approximately 1 million. There has not been any rail accidents in Sydney linked to OSA.

Metro Trains services a population of 4.82 million in Melbourne, employs around 3,500 people and has an average weekday ridership of 415,000. There has not been any rail accidents in Melbourne linked to OSA.

Queensland Rail services a population of 2.4 million in Brisbane, employs 6,520 people and has an average weekday ridership of approximately 150,000. There has not been any rail accidents in Brisbane linked to OSA.

**Table 14. Comparison of US and Australian rail operators**

Data	MTA, New York <sup>54</sup>	MBTA, Massachusetts <sup>55</sup>	Sydney Trains, Sydney <sup>56</sup>	Metro Trains, Melbourne <sup>57</sup>	Queensland Rail, Brisbane <sup>58</sup>
Population	20.2 million	6.86 million	5.37 million	4.82 million	2.4 million
Annual ridership	2.3 billion	~ 250 million	340.7 million	236.8 million	51 million
Average weekday ridership	7.7 million	> 800,000	> 1 million	415,000	~ 150,000
Employees	50,354	6,346	9,978	~ 3,500	6,520
Rail accidents linked to OSA	3	1	0	0	0

<sup>52</sup> Bronx (2013), Hoboken (2016) and Brooklyn (2017).

<sup>53</sup> Newton (2008).

<sup>54</sup> Metropolitan Transportation Authority, 2018, *Public Transportation for the New York Region*, <<http://web.mta.info/mta/network.htm>>.

<sup>55</sup> Massachusetts Bay Transportation Authority, 2017, *MBTA FY 2018 Budget Approved*, <<https://mbta.com/news/2017-04-13/mbta-fy-2018-budget-approved>>.

<sup>56</sup> Sydney Trains, 2018, *Facts and stats*, <<http://www.sydneytrains.info/about/facts>>; Sydney Trains, 2017, *Annual Report 2016-17*, <<https://www.transport.nsw.gov.au/system/files/media/documents/2017/sydney-trains-annual-report-2016-17.pdf>>.

<sup>57</sup> Metro Trains, 2018, *Who we are*, <<http://www.metrotrains.com.au/who-we-are/>>; Department of Economic Development, Jobs, Transport and Resources, 2017, *Annual Report 2016-17*, <<https://transport.vic.gov.au/content/docs/DEDJTR-Annual-Report-2016-2017.pdf>>.

<sup>58</sup> Queensland Rail, 2017, *Annual and Financial Report 2016-17*, <[https://www.queenslandrail.com.au/about%20us/Documents/QueenslandRail\\_AnnualFinancialReport\\_2016-17\\_LR.pdf](https://www.queenslandrail.com.au/about%20us/Documents/QueenslandRail_AnnualFinancialReport_2016-17_LR.pdf)>.

### B.2.3 Comparison of US and Australian rail fatalities

A comparison of the US and Australian rail fatalities has been undertaken to understand the fatality rate between 2010 and 2017.

The average fatality rate for Australia in 2016-17 (0.090 fatalities per million train km) is well below that for the US (0.865 fatalities per million train km). The Office of the National Rail Safety Regulator's Annual Safety Report states that "a review of the US figures by individual incident types suggests the average rate reflects a significantly higher proportion of trespass and level crossing-related fatalities compared to Australia's area of operation".<sup>59</sup>

Although the fatalities are not a result of or attributed to OSA, the number and rate of fatalities per million train kilometres provides a useful comparison between the high fatality rates in the US in comparison to Australia.

**Table 15. Comparison of US and Australian rail fatalities**

Jurisdiction		2010-11 <sup>60</sup>	2011-12 <sup>61</sup>	2012-13 <sup>62</sup>	2013-14 <sup>63</sup>	2014-15 <sup>64</sup>	2015-16 <sup>65</sup>	2016-17 <sup>66</sup>
<b>Australia</b> (SA, NSW, NT, Tas, Vic, ACT, WA)	<b>Fatalities</b>	14	19	5	19	9	12	16
	<b>Train km (million)</b>	76.3	79	79.2	118.2	115.7	153.4	177.3
	<b>Rate</b>	0.18	0.24	0.06	0.161	0.078	0.078	0.090
<b>United States</b>	<b>Fatalities</b>	725	683	685	744	765	779	846
	<b>Train km (million)</b>	1144	1171	1182	1060.6	1068.6	985.4	977.9
	<b>Rate</b>	0.63	0.58	0.58	0.701	0.716	0.719	0.865

<sup>59</sup> Office of the National Rail Safety Regulator, 2013, *Annual Safety Report 2012-13*, p. 23, <[https://www.onrsr.com.au/\\_\\_data/assets/pdf\\_file/0016/4930/NRSR017-Annual-Safety-Report-FA-web.pdf](https://www.onrsr.com.au/__data/assets/pdf_file/0016/4930/NRSR017-Annual-Safety-Report-FA-web.pdf)>.

<sup>60</sup> Ibid

<sup>61</sup> Office of the National Rail Safety Regulator, 2014, *Annual Safety Report 2013-14*, p. 20, <[https://www.onrsr.com.au/\\_\\_data/assets/pdf\\_file/0011/10442/J004064-Annual-Safety-Report-2014\\_WEB.pdf](https://www.onrsr.com.au/__data/assets/pdf_file/0011/10442/J004064-Annual-Safety-Report-2014_WEB.pdf)>.

<sup>62</sup> Office of the National Rail Safety Regulator, 2015, *Rail Safety Report 2014-15*, p. 10, <[https://www.onrsr.com.au/\\_\\_data/assets/pdf\\_file/0013/13270/Rail-Safety-Report-2014-2015.pdf](https://www.onrsr.com.au/__data/assets/pdf_file/0013/13270/Rail-Safety-Report-2014-2015.pdf)>.

<sup>63</sup> Ibid.

<sup>64</sup> Office of the National Rail Safety Regulator, 2016, *Rail Safety Report 2015-16*, p. 14, <[https://www.onrsr.com.au/\\_\\_data/assets/pdf\\_file/0017/18800/Rail-Safety-Report-2015-2016-Web-Digital.pdf](https://www.onrsr.com.au/__data/assets/pdf_file/0017/18800/Rail-Safety-Report-2015-2016-Web-Digital.pdf)>.

<sup>65</sup> Office of the National Rail Safety Regulator, 2017, *Rail Safety Report 2016-2017*, p. 11, <[https://www.onrsr.com.au/\\_\\_data/assets/pdf\\_file/0012/20514/Rail-Safety-Report-2016-2017-web.pdf](https://www.onrsr.com.au/__data/assets/pdf_file/0012/20514/Rail-Safety-Report-2016-2017-web.pdf)>.

<sup>66</sup> Ibid.

## Appendix C References

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