



In-Vehicle Monitoring Systems - Specification Standard

**This standard was produced by the Land Transport Working Group
of the Queensland Natural Gas Exploration and Production Industry
Safety Forum (Safer Together)**

Revision History

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Important Information for Users

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It is expected that companies adopting this standard will assume the responsibility for communication, implementation / formalisation and assurance of these requirements within their organisations and contractor community.

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1. Purpose

In-Vehicle Monitoring Systems (IVMS) are a requirement for both heavy and light vehicles operating in either rural or remote areas and participating with Queensland's Coal Seam Gas (CSG) industry. This document has been developed in order to provide a high-level minimum standard, which CSG industry participants and IVMS providers may refer to when specifying requirements for IVMS.

This standard is intended for use by operators and contractor partner companies operating in CSG industry in Queensland. It applies to both heavy and light vehicles undertaking operations associated with CSG Operators and contractor partners.

"Out of Scope"

- Plant and machinery ordinarily restricted to non-road related areas

This standard should be read and applied in conjunction with Transport Certification Australia's (TCA), '*Telematics In-Vehicle Unit (IVU) – Functional and Technical Specification*' (TCA IVU Specification – issued July 2015, available at <http://www.tca.gov.au/type-approvals/ivu-specification>).

Whilst IVMS providers are encouraged to achieve telematics IVU type-approval through TCA for their device, Queensland's CSG Industry does not mandate this requirement.

Where requirements of this standard directly align with a stated technical specification stipulated in the TCA IVU Specification, a reference shall be provided to the TCA document.

2. Requirements

The IVMS unit must be securely and permanently fixed into the vehicle.

All IVMS installation, repairs and recovery activities must be performed by an appropriately trained and authorised person and meet the requirements stipulated in the TCA IVU Specification. Records relating to the installation and certification of the IVMS unit must be maintained by the IVMS provider.

The absence of a permanently fixed and compliant IVMS unit or inability to meet any of the exception or reporting criteria detailed must be treated as a deviation from this standard. This includes the use of portable IVMS units. Any decision to deviate from this standard shall be at the discretion of the relevant CSG Operator and its contractor.



3. IVMS Capabilities

The IVMS unit must be able to monitor as a minimum:

REQUIREMENT	TOLERANCE
GPS location communicated by Next G coverage, digital radio or satellite (where fitted) - (as stipulated in the <i>TCA IVU Specification</i>)	Meets or exceeds the TCA IVU Specification
Date and time data (as stipulated in the <i>TCA IVU Specification</i>)	Meets or exceeds the TCA IVU Specification
Driver of the vehicle at any given time	Nil tolerance applicable
Vehicle speed (as stipulated in the <i>TCA IVU Specification</i>)	Meets or exceeds the TCA IVU Specification
Travel data (as stipulated in the <i>TCA IVU Specification</i>)	Meets or exceeds the TCA IVU Specification
Vehicle idle time in hh:mm:ss – for a vehicle maintaining a stationary position	Meets or exceeds the TCA IVU Specification
Driver and passenger/s (where fitted) seat belt engaged	Within + / - 2 seconds
Acceleration & Deceleration Events – LIGHT VEHICLES - currently 12km/hr/sec and 18km/hr/sec	No tolerance applicable
Acceleration & Deceleration Events – HEAVY VEHICLES - currently 0.40g and 0.60g	No tolerance applicable
4WD engaged on unsealed roads (where fitted / required)	No tolerance applicable
IVMS unit disconnection / tamper (battery, antenna, settings)	No tolerance applicable
Rollover & Impact sensors (where fitted / required)	No tolerance applicable
Identification details (vehicle ID, time, date, longitude, latitude, event type)	No tolerance applicable

The In-Vehicle Monitoring System must be capable of either meeting or exceeding:

REQUIREMENT
Tracking the current location of the vehicle online (on screen) 24 hours / 7 days a week by means of digital radio or Next G whilst in a coverage area. Provision for satellite communications to be fitted and monitored by the IVU (where required).
Whenever the ignition is on - storing IVMS data on the IVU every 200 seconds (maximum time), or at every vehicle 'event' – whichever is the lesser. 'Storing' does not include transmitting IVMS data.
Receiving and applying geofence information as supplied by the CSG industry. The geofences can be categorised by the CSG industry to any user-defined category, including – but not limited to – no-go zones and environmentally sensitive areas. The IVMS must be able to receive regular updates from the CSG industry in the form of an SQL Database, Excel Worksheets or Shapefile. To ensure consistency in reporting, the CSG industry geofence information must be uploaded in a format that cannot be edited by contractors and non-authorised personnel.



Retaining a minimum of 500 minutes of data on the IVU – in the event the vehicle remains in a remote area for a prolonged period and cannot transmit the data. 'Data' includes all information to inform on criteria stipulated in *IVMS SETTINGS, EXCEPTIONS AND REPORTING*; and engine diagnostics (where recorded). If the volume of data collected and generated prior to transfer from the IVU exceeds the data storage capacity of the IVU, new data shall overwrite stored data – commencing from the most historic.

Retaining a minimum of one (1) years data from the entire fleet on a server. Data is recoverable and capable of being presented in a suitable format to support reporting and investigation purposes.

Transmitting data and events as per the following:

a. Pre-determined data communication requirements:

- (i) If the IVU has been out of the Telstra Next G range for more than 60 minutes, poll the Satellite (where installed) for vehicle's longitude, latitude and identification details.
- (ii) If the CSG Operator, or contractor requires visibility on the number of vehicles in a particular area for a particular time, poll the IVU for vehicle's longitude, latitude and identification details.
- (iii) If the IVU is equipped with duress button / impact sensor - in the event of an incident or duress - poll the IVU for vehicle's longitude, latitude and identification details.

b. Providing a minimum of 60 minutes of second by second travel data preceding a vehicle accident or incident, or travel data as otherwise approved by the CSG Operator. Travel data includes all information to inform on criteria stipulated in *IVMS SETTINGS, EXCEPTIONS AND REPORTING*; and engine diagnostics (where recorded).

c. Transmitting data via satellite communications (where installed) on critical events – including rollover, duress and impact events. Data includes the vehicle's longitude, latitude and identification details.

d. Uploading trip data at the end of each trip – whilst in digital radio or Next G coverage. Trip data includes all information to inform on criteria stipulated in *IVMS SETTINGS, EXCEPTIONS AND REPORTING*; and engine diagnostics (where recorded).

Performing weekly IVMS health checks to identify disconnections and faulty units.

Processing events and exceptions based on geofence settings.

Sending alerts by SMS and/or email to agreed recipient/s.

Perform a 'find nearest vehicle' query.

Display historical and active (real time) tracking of a vehicle's trip history.

Ability for use of an Application Programming Interface (API) from the IVMS provider to its client for the use of creating integrated solutions within a third party system.



4. Driver and Vehicle Requirements

Information pertaining to both the driver and vehicle must be recorded in the following format:

Minimum Driver Information

Detail	Format	Example
Driver Name	Text	Surname, First Name
Driver Contact Number	Mobile Number	0400123456
Emergency Contact Number	Mobile Number	0411123456
Employer Name	Text	SmytheElectrical
Employer Contact Number	Number	0730001234
Employer Contact Number (escalation)	Number	0412456789

Minimum Vehicle Information

Detail	Format	Example
Vehicle Registration	Text / Number	XXX123
Vehicle Category – Austroads Classification: LV - Light vehicle: class 1-2 HV-B - Heavy vehicle (buses only): class 3-4 HV - Heavy vehicles (all other excluding buses): classes 3-12	Number as per Austroads Vehicle Classification System Classification 1-12	LV-1 HV-B-4 HV-7
Vehicle Company Owner	Text	SmytheElectrical
Vehicle ID	Text / Number	QH2345
Vehicle Make and Model	Manufacturer / Model	Toyota_Landcruiser



5. IVMS Settings, Exceptions and Reporting

The Queensland Natural Gas Exploration and Production Industry Safety Forum has endorsed the following speed settings for all CSG industry related vehicles servicing the CSG sector:

- Unsealed roads – maximum 80km/hr, unless a lower speed is signposted; and
- Sealed roads – as signposted.

The IVMS must be capable of monitoring and reporting on the following exception events/rules:

Exception Event Category	Exception Rule Parameter
Exceeding speed limit (geo-fenced area)	<ul style="list-style-type: none"> • >5 <=10kph for > 15 sec (Reportable Event – Category 1) • >10 <=15kph - instantaneous (Reportable Event – Category 2) • >15Kph - instantaneous (Reportable Event – Category 3)
Exceeding speed limit (outside geo-fenced area)	<ul style="list-style-type: none"> • >115 kph (Audible Alert in vehicle) • >115 <=120 kph for > 15 sec (Reportable Event – Category 1)* • >120 kph instantaneous (Reportable Event – Category 2)*
Drive without seatbelt	<ul style="list-style-type: none"> • Any motion >5kph for > 5 sec (Reportable Event)
4wd disengaged on unsealed roads (provision for data capture where required)	<ul style="list-style-type: none"> • Any motion >5kph for > 5 sec & 4WD not engaged on an unsealed road
Harsh deceleration/braking	<ul style="list-style-type: none"> • > 12kph/sec (Event) – LIGHT VEHICLE • > 0.40g (Event) – HEAVY VEHICLE
Excessive harsh braking	<ul style="list-style-type: none"> • > 18kph/sec (Reportable Event) – LIGHT VEHICLE • > 0.60g (Reportable Event) – HEAVY VEHICLE
Harsh acceleration	<ul style="list-style-type: none"> • > 12kph/sec (Event) – LIGHT VEHICLE • > 0.40g (Event) – HEAVY VEHICLE
Cruise Control on unsealed roads (provision for data capture where required)	<ul style="list-style-type: none"> • Any motion >5kph for > 5 sec & cruise control engaged on an unsealed road
Breaks (Journey Management)*	<ul style="list-style-type: none"> • 1hr 45min continuous driving (Audible Alert in vehicle) • >2hrs without a15 mins (continuous) break by individual (Event) • >2hrs 15min of continuous driving by individual (Reportable Event)



Reference to an 'Event' and 'Reportable Event' requires a CSG Operator or contractor to performance manage drivers behaviours as a consequence of their triggering an exception.

Reference to 'Reportable Event' further requires a CSG Operator or contractor (when undertaking CSG activities for a CSG Operator) to record and report the exception in line with the CSG Industry Reporting Template - refer to Appendix A).

Reference to 'Breaks (Journey Management)' – CSG Operators and contractors operating heavy vehicles are encouraged to adopt the 2-hour maximum driving rule, however may continue to operate in compliance with Heavy Vehicle National Law (HVNL). Heavy vehicle operators managing fatigue pursuant to HVNL, may be required to be segregate their fleet in IVMS.

A 'continuous break' requires the vehicle remaining stationary for the stated minimum period, but does not require the ignition to be turned off.

* - with reference to outside geo-fenced area denotes the default speed setting stored on the IVU as 110kph whilst in two-wheel drive. Only one 'reportable event' with maximum speed is to be recorded for each speeding event. *For example, a driver overtakes at a maximum speed of 125kph and maintains a speed greater than 115kph for >15 seconds. The **reportable event** in that circumstance will be one 'Category 2' event with a maximum speed of 125kph.*



Appendix A. Template for Monthly Reporting

QUEENSLAND CSG INDUSTRY MONTHLY PERFORMANCE REPORT

Safer Together
Queensland Natural Gas Exploration
& Production Industry Safety Forum

Reporting Period	Company	General Data			Designated Speed Events			Fatigue Events	Seat Belt Events	Acceleration / Deceleration Events		
	Contractor / Subcontractor (names recorded here)	Total km driven	Number of vehicles	Number of drivers	Speed Category 1	Speed Category 2	Speed Category 3	Fatigue Management >2:15hrs	Seat Belt Not Engaged	Harsh Acceleration	Harsh Braking	Excessive Harsh Braking
January												
February												
March												
April												
May												
June												
July												
August												
September												
October												
November												
December												
References												
Safer Together - CSG Industry IVMS Technical Specifications, 2015												
APPEA Sharing Safety Solutions: IVMS Minimum Settings for Light Vehicles												
APPEA Sharing Safety Solutions: IVMS Minimum Settings for Heavy Vehicles												
Land transportation safety recommended practice, International Association of Oil & Gas Producers, London, July 2011												
Land transportation safety recommended practice, Guidance Note 12, International Association of Oil & Gas Producers, London, July 2011												



Appendix B. CSG IVMS Event Data Table



Exception Event Category	Exception Rule Parameters	Report Parameters	Exception Rule Name	CSG Industry Monthly Performance Report - Headings
Exceeding speed limit (geofenced area)	> 5 kph - instantaneous in geofenced areas	>5 <=10kph for > 15 sec >10 <=15kph - instantaneous >15Kph - instantaneous	CSG - Exceeding Speed (geofenced) > 5 km/h	Speed Category 1 Speed Category 2 Speed Category 3
Exceeding speed limit (outside geofenced area)	> 115 kph - audible alert only > 115 kph - instantaneous outside geofenced area	Not required - audible alert only Speeding >115kph <= 120kph for >15 sec Speeding > 120kph	Not required - audible alert only CSG - Exceeding Speed (non-geofenced) > 115 kph	Not required - audible alert only Speed Category 1 Speed Category 2
Drive without seatbelt	Any motion >5kph for > 5 sec & seat belt not engaged	As per rule	CSG - Seat belt not engaged	Seat Belt Not Engaged
4wd disengaged on unsealed roads (where monitored)	Any motion >5kph for > 5 sec & 4WD not engaged & unsealed road	Operator dependent	CSG - 4WD not engaged	4WD Not Engaged
Harsh deceleration/braking	> 12kph/sec (Event) – LIGHT VEHICLE > 0.40g (Event) – HEAVY VEHICLE	As per rule As per rule	CSG - Harsh deceleration/braking -LV CSG - Harsh deceleration/braking -HV	Harsh Deceleration Harsh Deceleration
Excessive harsh braking	> 18kph/sec (Reportable Event) – LIGHT VEHICLE > 0.60g (Reportable Event) – HEAVY VEHICLE	As per rule As per rule	CSG - Excessive harsh braking -LV CSG - Excessive harsh braking -HV	Excessive Harsh Braking Excessive Harsh Braking
Harsh acceleration	> 12kph/sec (Event) – LIGHT VEHICLE > 0.40g (Event) – HEAVY VEHICLE	As per rule As per rule	CSG - Harsh acceleration -LV CSG - Harsh acceleration - HV	Harsh Acceleration Harsh Acceleration
Cruise Control on unsealed roads	Any motion >5kph for > 5 sec & cruise control engaged & unsealed road	Operator dependent	CSG - Cruise control engaged on unsealed roads	Cruise Control Engaged on Unsealed Roads
Breaks (Journey Management)*	1hr 45min continuous driving (audible alert only in vehicle) >2hrs without a 15 mins (continuous) break by individual	Not required - audible alert only >2hrs without a 15 mins (continuous) break by individual >2hrs 15min of continuous driving by individual	Not required - audible alert only CSG - Fatigue Management >2:00 hrs CSG - Fatigue Management >2:15 hrs	Not required - not a reportable event Not required - not a reportable event Fatigue Management >2:15 hrs



Appendix C. Example - Organisational IVMS Exception Report

Vehicle Rego	Driver	Reporting group	Event	Start date	Start time	End time	Duration	Value (kph)	Zone /Location	Start Street	End Street	Start Lat/long	End Lat/long	Reportable Events as per monthly reporting
ABC 123	J James	Operations - West	CSG - Exceeding Speed (geofenced) > 5 km/h	9/07/2015	12:22:12	12:22:52	0:00:40	88	CSG_80km	Smith St, Roma	Smith St, Roma			Speed Category 1
JBC 124	B Bell	HSE	CSG - Exceeding Speed (geofenced) > 5 km/h	10/07/2015	9:40:10	9:40:25	0:00:15	109	CSG_100km	Black st, Chinchilla	Black st, Chinchilla			Speed Category 1
JBC 127	B Bell	HSE	CSG - Exceeding Speed (geofenced) > 5 km/h	11/07/2015	2:22:12	2:22:19	0:00:07	66	OE_Condabri_GPF_50km	Taroom	Taroom			Speed Category 3
ABC 129	P Paul	Operations - West	CSG - Seat belt not engaged	12/07/2015	5:00:00	5:00:07	0:00:07	6	Miles	Miles Airport	Miles Airport			Seat Belt Not Engaged
ABC 130	R Robb	Operations - West	CSG - Fatigue Management >2:00 hrs	13/07/2015	12:00:00	2:00:47	0:00:01	0	CSG_80km	Taroom	Taroom			Not a reportable event
DBC 123	S Sam	Pipeline Operations	CSG - Fatigue Management >2:15 hrs	14/07/2015	2:00:00	2:22:52	2:22:52	0	CSG_80km	Taroom	Taroom			Fatigue Management >2:15 hrs
JBC 127	G Green	Drilling and Completions	CSG - Exceeding Speed (geofenced) > 5 km/h	11/07/2015	2:22:12	2:22:52	0:00:40	90	CSG_80km	Warrego Road, Miles	Warrego Road, Miles			Speed Category 2
JBC 127	G Green	Drilling and Completions	CSG - Exceeding Speed (geofenced) > 5 km/h	15/07/2015	2:22:12	2:22:52	0:00:09	73	OE_Reedy Creek_GPF_60km	Yuleba	Yuleba			Speed Category 2
JBC 127	G Green	Drilling and Completions	CSG - Exceeding Speed (non-geofenced) > 115 kph	11/07/2015	2:22:12	2:22:52	0:00:40	127	Dullangari	Dullangari	Dullangari			Speed Category 2 (Note: non CSG Industry geo-zoned location)
DBC 123	S Sam	Pipeline Operations	CSG - Exceeding Speed (geofenced) > 5 km/h	14/07/2015	10:00:00	10:00:04	0:00:04	71	Q_Asset 1_60km	Roma	Roma			Speed Category 2
DBC 123	S Sam	Pipeline Operations	CSG - Exceeding Speed (geofenced) > 5 km/h	14/07/2015	11:00:00	11:00:16	0:00:16	67	Q_Asset 2_60km	Roma	Roma			Speed Category 1



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