

Northern Territory Taxi and Minibus Security Camera Program

Specifications

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Commercial Passenger Vehicles Branch
Passenger Transport Division

Contents Page

| | | |
|------------|---|-----------|
| 1. | Camera System Specifications..... | 3 |
| 2. | System Construction | 3 |
| 3. | System Power | 4 |
| 4. | Fitting and Installation | 4 |
| 5. | Operational Indicators | 6 |
| 6. | Image Appearance..... | 7 |
| 7. | Image Recording..... | 7 |
| 8. | Image Download | 10 |
| 9. | Security | 11 |
| 10. | Maintenance and Warranty..... | 12 |
| 11. | System Certification..... | 13 |
| 12. | Annexes | 13 |
| | Annex A – Range of Operating Environment Conditions | 13 |
| | Annex B – Electromagnetic Compatibility..... | 14 |
| | Annex C – Resistance to Vandalism..... | 14 |
| | Annex D – Submersion Protection | 14 |
| | Annex E – Impact and Shock Resistance..... | 15 |
| | Annex F – System parameter setting..... | 15 |

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This document is approved and published by the Director of Commercial Passenger (Road) Transport with reference to regulation 27Q(1) of the Taxis Regulations.

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 Registrar of Motor Vehicles
 Director of Commercial Passenger (Road) Transport

1. Camera System Specifications

- 1) The following specification identifies the minimum requirements necessary for a security camera system that is supplied and installed into a taxi or minibus in the Northern Territory.

2. System Construction

- 2) The system shall be constructed such that the internal camera housing does not have any sharp edges or protrusions that may cause injury to the taxi or minibus driver or a passenger.
- 3) The camera system shall be designed such that any adjustment in the alignment of the camera(s) requires the use of specialised tools.
- 4) All system components, including the camera housing and recording unit, shall be resistant to tampering, vandalism and/or degradation of the images by intentional or accidental damage. Refer to Annex C.
- 5) The camera system shall be capable of functioning in the normal range of operating temperatures and humidity found within the confines of a taxi or minibus. As a minimum this range is defined as 0C to +60C. Refer to Annex A.
- 6) The camera system construction shall be such that the level of electromagnetic emissions does not inappropriately interfere with other electronic systems on board the taxi or minibus. Conversely the camera system shall be protected from interference from sources of electromagnetic interference found in a taxi or minibus. Refer to Annex B.
- 7) Images from the security camera system shall be capable of being recovered following submersion in saline water or fresh water to a depth of six metres for a minimum period of seventy-two (72) hours. Refer to Annex D.
- 8) Images from the security camera system shall be capable of being recovered following five (5) minutes exposure of the image storage unit within a furnace operating at 5380C.
- 9) The security camera system shall be impact and shock resistant, sufficient to withstand a typical car accident and withstand the regular vibration experienced by a taxi or minibus. Refer to Annex E.
- 10) All system components shall be easily interchangeable in the event of failure or damage.
- 11) It shall be possible to change parameters relating to the camera system operation and configuration without changing components. Refer to Annex F.
- 12) The system shall have a minimum of one internal camera. Optionally additional internal cameras and/or external cameras may be fitted.
- 13) Any external camera fitted to the taxi or minibus shall be constructed such that the external camera housing does not have any sharp edges or protrusions that may cause injury to, or obstruct the field of view of, the taxi or minibus driver. External cameras shall be located within the outline of the vehicle.
- 14) The camera shall use an image sensor with a minimum resolution equivalent to 330 TVL (Horizontal). A minimum grey-scale of 256 levels is required.

- 15) The system shall use non-volatile memory to store all captured images. The use of volatile memory is not permitted.
- 16) The system shall be designed and installed such that it may be easily tested by an approved person to ensure that the system is functioning correctly and that images are being recorded as prescribed by these Specifications. The testing of the camera alignment and image quality shall be through an easily accessible test point, which cannot be used as a connection to obtain recorded material when the taxi or minibus is operating other than for an authorised purpose.
- 17) The system shall be fitted with a spring-loaded push-button or lever switch in order to initiate manual image capture. The pushbutton or lever switch shall be installed such that its presence and purpose shall not be easily apparent to any passenger travelling in the taxi or minibus.
- 18) The system shall be provided with either:
 - a) a physical interface to the duress alarm fitted to the vehicle; or
 - b) a spring-loaded push-button or lever switch in order to initiate image capture for a duress alarm event. The push-button or lever shall be interfaced to the duress alarm interfaces provided on other in-vehicle system such as the dispatch computer or two-way radio system. The pushbutton or lever shall be installed such that its presence and purpose shall not be easily apparent to any passenger travelling in the taxi or minibus.

Additionally the physical construction of the button mechanism shall be designed to prevent, as far as is reasonable, false activation of the duress alarm by the driver during the normal operation of the taxi or minibus.

3. System Power

- 19) The system shall be capable of capturing and storing images in the normal range of supply voltage available in the vehicle it is fitted in and shall be protected against reverse voltage, short circuits, and high voltage transients likely to be encountered in the vehicle's electrical system.
- 20) The system shall draw a maximum current of 2 amps for each camera when taking images. The system shall draw no more than 0.5 amps in total when not taking images.
- 21) The camera system shall be powered and operational in no more than 30 seconds from the time that the vehicle ignition is turned on and shall remain operational for a minimum period of thirty minutes after the ignition is turned off.
- 22) Should the system voltage fall outside the operating range specified in [19] then the system shall re-boot as soon as the voltage returns to the normal operating range.
- 23) The camera system shall not include a manual on/off switch that would allow the system to be turned off or in any way disabled during normal operation.

4. Fitting and Installation

- 24) Fitting and installation shall include programming of the camera system to:
 - a) correctly store the identification (such as the registration number) of the taxi or minibus that the system is being fitted to; and

NT Taxi and Minibus Security Camera Specifications

- b) correctly initialise the date and time that will be used to time stamp the images that are captured. Refer requirement [55].
- 25) Camera system installations, including the transfer of a camera into a replacement taxi or minibus, shall only be undertaken by an installer approved by the manufacturer or supplier.
- 26) The internal camera(s) shall at all times provide a clear view of the taxi or minibus driver and all seated passengers when inside the vehicle. The view shall not be obscured, or be capable of being obscured either permanently or temporarily, by any sun visor or other fitting or equipment installed in the vehicle.
- 27) In order to comply with requirement [26] it may be necessary to install more than one internal camera. Where this is the case the requirements relevant to the internal camera contained in this specification shall be interpreted as applying to all internal cameras.
- 28) The internal camera(s) shall be readily visible to passengers in the vehicles. All internal camera(s) shall be mounted in such a manner so as to prevent intentional or unintentional misalignment of the field of view, except in the case of a vehicle accident or other severe impact.
- 29) Ancillary lighting shall be fitted so as to provide adequate illumination of the interior of the taxi or minibus in low light conditions.
- 30) In the event that an external camera is fitted then ancillary lighting shall be fitted to provide adequate illumination of the field of vision of the camera in low light conditions.
- 31) The external camera shall be positioned to provide a view of any person standing at the driver's window or approaching the driver's window from up to 3 metres and a minimum field of view of 1200 relative to the driver's window.
- 32) The external camera may be concealed or otherwise not be identifiable to persons outside the taxi or minibus.
- 33) Additional internal or external cameras may be fitted but shall comply with image quality requirements specified for the system and shall be fitted as required by these specifications. Any additional cameras installed shall not cause the image capacity of the system to fall below the minimum capacity required per item 59.
- 34) The taxi or minibus shall be fitted with signs affixed to all entry points of the taxi or minibus and conspicuously placed in the interior of the taxi or minibus so that all occupants are made aware they may be under security camera surveillance.
- 35) The installation of the camera system and accessories shall not affect the continued compliance of the taxi or minibus with all other relevant legislative requirements (e.g. *Commercial Passenger (Road) Transport Act*, *Motor Vehicles Act*, *Taxis Regulations* and the *Australian Design Rules*).
- 36) The camera system shall be capable of being installed in a variety of vehicles including but not limited to sedans, station wagons and multi-person vehicles, that are currently approved for use as taxis or minibuses in the Northern Territory.
- 37) The internal camera housing(s) shall be positioned such that passengers or drivers cannot come into contact with the housing during normal operation.

NT Taxi and Minibus Security Camera Specifications

- 38) The cameras and all system components shall be installed in a manner that does not interfere with the driver's vision or view of mirrors or otherwise normal operation of the vehicle.
- 39) The camera system shall not inappropriately interfere with any other systems on board the taxi or minibus, and shall itself not be affected by any sources of interference likely to be encountered in the taxi or minibus.
- 40) Apart from the camera unit, internal supplementary lighting and GPS receiver/antenna (if fitted), all other components of the security camera system shall be concealed from the taxi / minibus passengers.
- 41) All cabling associated with the camera system shall be concealed and be, as far as practicable, tamperproof and vandal resistant.
- 42) The removal of all components of the camera system shall require specialist tools for removal. For the avoidance of doubt it is expected that the fixings used on the camera system will be constructed such that tools in common use cannot be used to remove components of the system. This requirement can also be met by deploying key locking systems to protect fixings used to secure the camera system to the vehicle.
- 43) The camera system shall not include a switch, plug, fuse or any other device in the cabin of the taxi that would allow the system to be turned off or in any way disabled by a driver or passenger.
- 44) The main housing of the camera system shall be indelibly inscribed or imprinted with a unique serial number.
- 45) Installation of the recording unit shall include easy access to the connection point to obtain recorded material without the need to enter the cabin area of a taxi or minibus other than to release the boot lock or release the rear tailgate door on station wagon or van type vehicles. Access to the connection point shall not require any dismantling of vehicle fittings or recorder unit.

5. Operational Indicators

- 46) The driver shall have a visual indicator showing when the system is operational and when there is a malfunction. This indicator shall incorporate the following minimum features:
 - a) Normal display state;
 - b) Valid image capture;
 - c) Memory full;
 - d) System fault.
- 47) Where a system is fitted with an indicator to show that it is powered, this indicator shall be separate to those described in requirement [46], and/or of a different colour to avoid any possible confusion on the part of drivers using the system.
- 48) Additional, optional, indicators may be provided but these should be designed so as to avoid confusion with the four mandatory indicators nominated in this requirement. Where optional indicators are proposed the colour, purpose and location of each indicator should be identified in the compliance statement.

- 49) Any request from a camera system manufacturer to incorporate additional indicators identified in requirement [48] shall take into account the ability to standardise optional indicators in all States and Territories.
- 50) Optionally, the camera system may be interfaced to the mobile data terminal, if fitted, and any failure of the camera system indicated to the taxi or minibus driver via the mobile data terminal display.

6. Image Appearance

- 51) The resolution and clarity of the recorded image from the internal camera(s) shall be maintained under a range of lighting conditions from darkness (no light in the visible spectrum) through to bright sunlight.
- 52) All occupants of the vehicle are to be visible in the captured images taken from the internal camera. In order to comply with this requirement more than one internal camera may be fitted for larger vehicles (e.g. high occupancy / wheelchair accessible vehicles). In accordance with Australian Standard AS 4806.2 for facial identification, the stored images shall record a minimum of 360 pixels per metre both horizontally and vertically for each occupant of the vehicle and, if an external camera is fitted, for a person outside the vehicle standing up to one (1) metre away from the driver's window.
- 53) The camera lenses shall have an auto iris or electronic auto-exposure adjustment facility such that image clarity is not adversely affected by light fluctuations.
- 54) The lenses fitted to both internal and external cameras shall be capable of maintaining images in focus at any distance between 300 mm and 10 metres from the lens.
- 55) All recorded images shall be time, date and taxi or minibus specific, with details shown on the image and/or encrypted within the image file. It shall be possible to determine from a recorded image file the date and time (Australian Central Standard Time format) at which the image was taken and the registration number of the taxi or minibus in which it was taken. For the purposes of clarification the information referred to in this requirement should be positioned within the image such that it does not obstruct the view of any occupant in a seated position within the vehicle.
- 56) For the avoidance of doubt the information specified in requirement [55] shall be clearly visible when viewing the image in its electronic format, including encrypted and unencrypted formats, using the proprietary downloading software. In addition the information shall be clearly visible on any images that are printed or exported to external media. In the case of external media it shall be possible to view the image plus related information concerning the taxi or minibus, date and time using industry standard image viewing software. Refer to item [98] for details of the types of file to be viewed.
- 57) If a taxi or minibus is fitted with an operational vehicle tracking device (for example GPS), the security camera system shall record the latitude and longitude information on the image and/or encrypt within the image file.

7. Image Recording

- 58) The camera system must operate in a continuous recording mode. A continuously recording camera system is one that only records images on a fixed periodic basis independently of any external trigger. However, the camera system is required to

NT Taxi and Minibus Security Camera Specifications

monitor and tag specific trigger events by means of connections to appropriate status points in the vehicle electrical system.

- 59) The system shall be capable of capturing a minimum of one hundred and twenty (120) hours (that is, five days) of recorded images during normal operation, that is without the operation of the duress alarm. The 120 hour recording period includes all times that the camera is active and recording images.
- 60) The maximum time interval between recording any two images is five (5) seconds. There is no minimum time interval between recording any two images.
- 61) The system shall monitor the status of any door in the taxi or minibus. When the first of any door, including the driver's door, is opened, the system shall tag all images immediately following the door opening with a suitable status message such as "Door Open". Tagging shall continue until such time as the last door is closed. The Director may exempt a vehicle or class of vehicle from this requirement, provided that which is specified in requirement [60] is not less than a maximum time interval between any two images of 0.5 of one (1) second, i.e. recording a minimum of two frames per second.
- 62) The system shall monitor the status of the taximeter. When the taximeter is turned on the system shall tag all images immediately following with a suitable status message such as "Meter On". Tagging shall continue until such time as the taximeter is turned off.
- 63) The system shall monitor brake pedal activation. When the brake is activated the system shall tag all images immediately following with a suitable status message such as "Brake On". Tagging shall continue until such time as the brake is de-activated. The Director may exempt a vehicle or class of vehicle from this requirement, provided that which is specified in requirement [60] is not less than a maximum time interval between any two images of 0.5 of one (1) second, i.e. recording a minimum of two frames per second.
- 64) The recording of audio is not permitted unless otherwise approved in writing by the Director.
- 65) The camera system shall store images with a minimum of 256 grey scales.
- 66) The camera shall capture monochrome images. The use of colour images is permitted, subject to the camera providing an equivalent image resolution and quality to that of a monochrome camera in normal lighting conditions and the camera reverting to monochrome operation in low light conditions.
- 67) Activation of the driver duress alarm shall result in all images from the most recent journey (that is, since the last meter on event) being retained. In addition the camera system shall record images at a rate not less than one (1) image per second from each camera, for a minimum of a further five (5) minutes immediately following the activation of the driver duress alarm. All images recorded following the activation of the driver duress alarm are to be retained such that the images cannot be overwritten in memory until:
 - a) the images are downloaded to a secure computer; or
 - b) the images are made available for overwriting through an external reset operation; or

- c) the images are made available for overwriting by the timer protection function described in [70].
- 68) The driver shall be able to manually trigger the tagging of images separately to the automatic triggers and activation of the duress alarm.
- 69) When the manual trigger is operated, as a minimum the most recent 15 images shall be retained in a separate area of memory. Images recorded in response to a manual trigger shall not be overwritten by images captured through the triggers set out in [59] or [67]. The images shall be retained until:
 - a) the images are downloaded to a secure computer; or
 - b) the images are made available for overwriting through an external reset operation; or
 - c) the images are made available for overwriting by the timer protection function described in [70].
- 70) The system shall protect images retained through the activation of a driver duress alarm or a manual trigger from being overwritten until the expiry of a fixed timer. The timer shall have a minimum value of one hundred and sixty-eight (168) hours and measurement shall commence from the time at which the final image of an activation event has been captured and stored in the image store.
- 71) The timer in requirement [70] shall actively count time only when the camera system is operational and taking images. The timer value shall be preserved in the event that the power is removed from the system.
- 72) The camera shall provide a function that enables all images that are stored in the image memory to be made unavailable for overwriting. Activation of this function shall be achieved by operation of the driver duress alarm and/or the manual trigger in some combination. The images shall remain unavailable for overwriting until the images have been downloaded or an external reset has been executed. [Note: the purpose of this function is to enable the police or other Government organisation to ensure that all images stored in the camera are frozen and available for viewing until unlocked.]
- 73) The recording system shall be configured such that the recording medium shall automatically commence re-recording once the medium has reached its recording capacity. The oldest images shall be overwritten first.
- 74) For the avoidance of doubt any reference to image tagging shall be interpreted as recording information concerning the status of the trigger event that occurs when the image is captured. When downloading or viewing any image it shall be possible to also see the associated trigger event information.
- 75) It is permitted for the camera system to retain images for more than one driver duress alarm event. However, this is subject to the constraint that the total image storage capacity available for images captured other than those captured by the activation of a driver distress alarm shall not be less than a three hour recording period (see also [59]).
- 76) In the event that the available image storage capacity falls below the minimum threshold defined in requirement [75] then the operational indicators shall indicate memory full. The memory full indication shall remain in force until the images are downloaded to a secure computer or until the camera system has been reset.

8. Image Download

- 77) The supplier shall make available copies of downloading software with the associated passwords and any specialised cables needed to connect a downloading computer to the camera system to government agencies nominated by the Department. This shall be free of charge.
- 78) The software referred to in [77] shall be compatible with the current Northern Territory Government supported versions of Microsoft software operating environments. Other operating systems will be considered provided that they are compatible with personal computers and do not interfere with the normal operation of the computer when operating with Microsoft software operating environments.
- 79) The manufacturer and/or supplier shall provide technical assistance with the installation of downloading software at nominated government agencies nominated by the Department. This shall be free of charge.
- 80) The manufacturer and/or supplier shall put in place necessary arrangements to ensure that the system shall be supported by a twenty-four (24) hour technical support facility for recovery of images from taxis or minibuses fitted with an approved camera system.
- 81) The manufacturer and/or supplier shall make available a twenty-four (24) hour technical support facility in the event that a serious incident occurs in which the police require assistance with the recovery of images. This shall be made available free of charge.
- 82) The camera system shall provide a log of all access made by an external computer or similar. Events to be logged shall include:
 - a) Taking of test images;
 - b) Setting or changing of system parameters, including the old and new values of the changed parameters;
 - c) Resetting or modifying images stored in the camera system memory;
 - d) Downloading images stored in the camera system memory to an external computer.
- 83) For each event in requirement [82] the log file shall include, but not be limited to, identification of persons accessing the camera system the time and date that the access occurred and the action(s) undertaken during the entire period of the access.
- 84) The log file referred to in requirement [82] and [83] shall be stored in the camera system memory and shall be protected against unauthorised access. It shall not be possible to delete the log file or any individual entry in the log using the downloading software or any other software provided by the manufacturer and/or supplier to authorised persons. The size of the log file shall be such that any logged event shall be retained for a minimum period of three (3) months.
- 85) The downloading software shall provide a log of all access to the software by users. Events to be logged shall include:
 - a) Logon of each user; or
 - b) Connecting to a camera system; or

- c) Setting or changing system parameters on a camera system, including the old and new values of the changed parameters; or
 - d) Re-setting or modifying images stored in the camera system memory; or
 - e) Downloading images stored in the camera system memory; or
 - f) Attempted modification or manipulation of image files stored on the downloading computer; or
 - g) Printing images stored on the downloading computer; or
 - h) Exporting images stored on the downloading computer to an external media file.
- 86) For each event in requirement [85] the log file shall include, but not be limited to, identification of persons accessing the downloading software, the time and date that the access occurred and the action(s) undertaken during the entire period of the access. The size of the log file shall be such that any logged event shall be retained for a minimum period of twelve (12) months.
- 87) The log file referred to in requirement [85] and [86] shall be stored in non-volatile memory on the downloading computer and shall be protected against unauthorised access. The manufacturer shall take reasonable steps to prevent deletion of the log file or any individual entry in the log using the downloading software or any other software provided by the manufacturer and/or supplier to authorised persons.
- 88) The supplier shall develop and implement any additional procedures to:
- a) test, service and maintain any security camera system that has been installed; and
 - b) facilitate compliance with any Regulations and Standards as required by the Department or any other Northern Territory Government department from time to time.
- 89) The test, service and maintenance procedures referred to in requirement [88] shall be subject to approval by the Department.

9. Security

- 90) Access to proprietary software used to download images shall be restricted to prevent the unauthorised recovery of images.
- 91) Measures shall be implemented to ensure that it shall not be possible to download images using manufacturer's software that is capable of downloading images from a security camera system in another State or Territory. This requirement extends to downloading images taken by a Northern Territory camera system on manufacturer's downloading software in another State or Territory.
- 92) Manufacturer's software shall be password protected to prevent the unauthorised viewing, recovery or reproduction of images. Where an image is stored on the hard drive of a computer, access to the image shall be protected by password so that it cannot be viewed, copied, printed or otherwise reproduced by an unauthorised person.

- 93) It shall be possible to determine if an image has been manipulated in any way whilst held on the security camera system or on another external storage medium. This may be achieved by using signature encryption, or any other similar method, which meets relevant evidentiary requirements for legal action.
- 94) The use of image compression techniques is permitted subject to the image resulting from the application of image compression meeting the relevant evidentiary requirements for legal action.
- 95) Image storage media shall be designed such that only authorised persons can remove it from the taxi or minibus; however, such authorised removal and exchange shall be easily facilitated by the system.
- 96) The reset function and the download function shall not remove or erase or make unavailable any image resident in the camera system. The reset function shall only enable images stored in the image memory to be made available for overwriting during the normal course of camera operation.
- 97) It shall be possible to print images recovered from the camera system on a standard laser printer using proprietary downloading software.
- 98) It shall be possible to export images recovered from the camera system to an external media including, but not limited to, floppy discs, CD-ROM or DVD-ROM. The exported images shall be formatted using industry standard formats including, but not limited to, JPEG or BMP. Where required by the Department it shall be possible to export images in an encrypted format.
- 99) The camera system fitted to the vehicle shall retain a log of all re-starts or power-down events that have occurred. This log shall be securely stored in memory and shall be retained for up to three (3) months from the date that the event occurred.
- 100) The camera system fitted to the vehicle shall re-boot to the same status as that which was current at the time that the re-boot event occurred should the re-boot be caused by loss of power to the camera system. In all cases the camera system shall preserve all images captured up to the point at which the reboot event occurred.

10. Maintenance and Warranty

- 101) The system shall be provided with comprehensive installation, testing and operating instructions in printed or electronic format including, but not limited to, the necessary information to enable the installation, commissioning and maintenance of the system. This information shall only be made available to persons approved by the manufacturer, supplier and the Department.
- 102) The system shall be provided with clear and concise operating instructions, which shall take account of the needs of operators for who English is not the first language. These instructions shall comprise printed materials, a copy of which shall be supplied with each camera system installed.
- 103) The manufacturer shall undertake to provide and maintain reasonable stocks of replacement components for the camera system such that the time-scales set out in requirement [104] can be met.
- 104) The system shall be designed such that the time to replace a component, in the event of failure, is less than two (2) hours, subject to the system being taken to an approved agent.

- 105) The manufacturer and/or supplier shall provide, through approved agents, one or more repair facilities in the Darwin and Alice Springs areas, which operate during normal business hours and on a callout basis outside of these hours. The Director may exempt a manufacturer and/or supplier from the requirement to provide repair facilities in each of these areas, provided they do not supply camera systems to the unsupported areas. Consideration of any exemption will be on a case by case basis.
- 106) The manufacturer and/or supplier shall provide repair facilities in the Katherine, Tennant Creek and Nhulunbuy areas per the arrangements in [105] or as otherwise approved by the Director.
- 107) The manufacturer and/or supplier shall provide an in-country technical support facility for the camera system. Such a facility shall operate during normal business hours as a minimum.
- 108) The manufacturer shall undertake to train the personnel of government agencies nominated by the Department in the use of the image downloading processes.

11. System Certification

- 109) The manufacturer shall supply a statement of compliance for all of the requirements set out in this document. The statement shall address each requirement and shall state one of the following three states for each requirement:
 - a) Fully compliant – the system fully complies with the requirement
 - b) Partially compliant – the system complies with some of the requirement. An additional statement setting out the areas of non-compliance is required
 - c) Not compliant – the system fails to substantially conform to the requirement.
- 110) Where the manufacturer is stating full compliance against requirements [5], [6], [7], [8] or [9] the manufacturer shall supply, as a minimum, documentation that:
 - a) details the testing that has been undertaken; and
 - b) identifies the person or organisation that has undertaken the testing; and
 - c) details the results of the testing.

12. Annexes

Annex A – Range of Operating Environment Conditions

The purpose of requirement [5] is to ensure that the complete camera system has been tested to ensure that it will operate reliably in the normal range of temperatures and humidity that will be experienced in a taxi or minibus. It is expected that camera systems that are being nominated for approval in the Northern Territory will have been tested to ensure that they will meet this requirement. Where specific testing has been undertaken to prove the operating range, the manufacturer or supplier shall provide details of the testing that has been undertaken along with any test results.

If specific testing has not been undertaken then the manufacturer or supplier shall state partial or non-compliance (as applicable) against the requirement with the reasons why the unit is expected to operate reliably in a taxi or minibus.

Annex B – Electromagnetic Compatibility

The purpose of requirement [6] is to ensure that the complete camera system has been tested to ensure that it will not interfere with other electronic systems found in a taxi or minibus, or that other electronic systems will not cause the system to operate unreliably.

The Department does not specify particular tests that need to be successfully undertaken in order to meet this requirement, this is a matter for the system manufacturer to determine based on industry practice. Where specific testing has been undertaken to prove electromagnetic compatibility, the manufacturer or supplier shall provide details of the testing that has been undertaken along with any test results.

If specific testing has not been undertaken then the manufacturer or supplier shall state partial or non-compliance (as applicable) against the requirement with the reasons why the unit is expected to operate reliably in a taxi or minibus.

Annex C – Resistance to Vandalism

The purpose of requirement [4] is to ensure that the construction of the camera system is such that it will provide reasonable protection to the images that are stored in the memory. The Department does not specify particular tests that need to be successfully undertaken in order to meet this requirement, this is a matter for the system manufacturer to determine based on industry practice. However, the manufacturer or supplier shall describe the particular measures that have been taken to protect the images stored in the memory from deliberate acts of vandalism. Where specific testing has been undertaken to prove the resistance to vandalism or accidental damage the manufacturer or supplier shall to provide details of the testing that has been undertaken along with any test results.

If specific testing has not been undertaken then the manufacturer or supplier shall state partial or non-compliance (as applicable) against the requirement with the reasons why the unit is expected to resist damage through vandalism or accidental impact damage.

Annex D – Submersion Protection

The purpose of requirement [7] is to ensure that the image storage unit can withstand immersion in saline or fresh water for a minimum period of 3 days. This simulates the potential effect of a taxi or minibus being accidentally or deliberately submersed in water. The Department does not prescribe a specific test methodology to prove compliance but the following is provided for guidance:

- A test duration of 72 hours should be seen as a minimum requirement, longer test periods are encouraged.
- A 5% saline solution should be used for the test.
- The test may be executed by completely immersing the image recorder unit in a 6 m column of saline water.
- The test may be executed by completely immersing the image recorder in a small volume of water and using an external pressure source to raise the water pressure to the required level (approximately 59kPa).
- The testing should ensure that images stored in the image store prior to immersion are successfully recovered at the end of the test period.
- It is preferred that the test should be made on the image store in-situ within the image recorder rather than stand-alone.

Where specific testing has been undertaken to prove the compliance with immersion requirements the manufacturer or supplier shall provide details of the testing that has been undertaken along with any test results.

If specific testing has not been undertaken then the manufacturer or supplier shall state partial or non-compliance (as applicable) against the requirement with the reasons why the unit is expected to resist immersion in saline and fresh water.

Annex E – Impact and Shock Resistance

The purpose of requirement [9] is to ensure that the image storage camera system can withstand the vibration that will be experienced during the normal operation of a taxi or minibus. In addition the image storage components of the camera system are expected to survive the shock waves that are experienced during a vehicle impact event, such as a moving traffic accident. The Department does not prescribe a specific test methodology to prove compliance.

Where specific testing has been undertaken to prove the vibration, impact and shock resistance of the camera system the manufacturer or supplier shall provide details of the testing that has been undertaken along with any test results.

If specific testing has not been undertaken then the manufacturer or supplier shall state partial or non-compliance (as applicable) against the requirement with the reasons why the unit is expected to resist the effects of impact and shock resistance.

Annex F – System parameter setting

The purpose of requirement [11] is to ensure that the key parameters relating to the operation of the camera are, where practicable, capable of being adjusted by changing software parameters rather than changing or adjusting electronic components. For the purposes of clarification, examples of the parameters to be software defined are:

- Accessibility – username/password and access levels
- Taxi or minibus camera identity – car number, network provider, etc
- Input triggers – activate/deactivate, input signal type/level, anti-bounce timers, etc
- Inter-image timers
- Image overwrite timers – enable/disable and timer settings
- Image capture state machine settings
- Insertion of displayed data into stored images (GPS co-ordinates, taxi or minibus ID, date and time stamps, etc)
- Image resolution and file size
- Image encryption algorithm(s)
- System logfile event triggers
- External indicator trigger events and display parameters (LED colour, flashing sequences etc).

Please note that this list represents examples of parameter settings and it should not be viewed as being complete or exhaustive. It is expected that the majority of parameter settings will be defaulted to values that conform to the requirements of the Department. These default settings

NT Taxi and Minibus Security Camera Specifications

will be applied at the time that the camera system is delivered from the manufacturing plant and will not normally require adjustment by the camera installer with the exception of the taxi or minibus camera identity settings. The camera manufacturer is to take reasonable measures to ensure that unauthorised personnel cannot adjust the default parameters without the consent of the manufacturer.

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