

ROADS AND MARITIME SERVICES (RMS)

QA SPECIFICATION R317

MAINTENANCE OF COMMUNICATION SYSTEMS

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GUIDE NOTES
(Not Part of Contract Document)



MAINTENANCE OF COMMUNICATION SYSTEMS

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VERSION FOR: DATE:

CONTENTS

CLAUSE	PAGE
FOREWORD	ii
RMS Copyright and Use of this Document	ii
Revisions to Previous Version	ii
Project Specific Changes	ii
1 GENERAL.....	1
1.1 Scope	1
1.2 Definitions and Abbreviations.....	1
1.3 Relevant Documents And Order Of Precedence	2
2 MAINTENANCE SERVICES	2
2.1 Asset Inspection.....	2
2.2 Planned Maintenance.....	2
2.3 Reactive Maintenance.....	3
2.4 Incident Support	5
3 PARTS AND EQUIPMENT	5
3.1 Supply.....	5
3.2 Holding Stock.....	5
3.3 Damaged, Defective, Obsolete Or Redundant Equipment	5
4 PERFORMANCE REQUIREMENTS (ASSET SPECIFIC)	6
4.1 Design Life	6
4.2 Availability (Operational)	6
5 REPORTING AND RECORD KEEPING	6
5.1 Reporting	6
5.2 Record Keeping.....	7
ANNEXURE R317/A – REFERENCE DOCUMENTS	8
A1 RMS ITS Maintenance Specifications	8
A2 RMS ITS Equipment Specifications.....	8
A3 O&M Manuals.....	8
A4 Australian Standards.....	8
ANNEXURE R317/B – SAMPLE PREVENTATIVE ROUTINE MAINTENANCE SERVICE REPORT.....	9
ANNEXURE R317/C – SAMPLE FUNCTIONAL CHECK SERVICE REPORT.....	11
ANNEXURE R317/D – SAMPLE INCIDENT SUPPORT REPORT	13
ANNEXURE R317/E – FAULT CODES AND RESPONSE TIMES.....	15
LAST PAGE OF THIS DOCUMENT IS.....	15

FOREWORD

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REVISIONS TO PREVIOUS VERSION

This document has been released as RMS Specification R317 Edition 1 Revision 0.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

PROJECT SPECIFIC CHANGES

Any project specific changes have been indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

RMS QA SPECIFICATION R317**MAINTENANCE OF COMMUNICATION SYSTEMS****1 GENERAL****1.1 SCOPE**

This document sets out the special requirements for the Maintenance of Communication Systems (the “Services”). The Specification is formed only when this document is read together with RMS QA R300 ITS Maintenance Services – General Requirements. The details herein include the Services relevant to Communication Systems, so that they remain in good condition, operate as designed and meet the specified performance requirements. The Communication Systems to be maintained under the Services includes, but not limited to all communication equipment (Mediums such as Copper, Twisted Pair, Fibre, Radio or Services such as PDH, SDH, ISDN, ADSL, GSM and IP) excluding those already covered in the relevant ITS Type specific Maintenance Specifications as listed in RMS QA R300.

1.2 DEFINITIONS AND ABBREVIATIONS

The following definitions and abbreviations, in combination with those listed in R300, are applicable to this Specification.

1.2.1 Definitions

Term	Description
Enclosure	A housing providing an appropriate degree of environmental protection against contact with live parts (AS/NZS 60529).
Power backup equipment	Includes backup power generator, UPS, batteries and charging units, photovoltaic power supply where applicable, power regulators, etc.
Protocol	RMS Communications Protocol For Roadside Devices (TSI-SP-003)
Supply Point (also known as Connection Point)	The junction of the electricity distributor’s low voltage network conductors with the consumer’s mains, i.e. the point at which the power supply is connected to the Utility network.
Supports	All structural components, brackets, clamps, straps and parts thereof, used to support the Communication Equipment.
Site/work site	Communication Equipment site.

1.2.2 Abbreviations

Term	Description
AC	Alternating current
DC	Direct current
EPV	Elevated platform vehicle (same as elevated work platform)

GSM	Global System for Mobile communication
HAR	Highway advisory radio
LED	Light Emitting Diode
OEM	Original Equipment Manufacturer
O&M	Operations and Maintenance
RCD	Residual current device
RF	Radio Frequency

1.3 RELEVANT DOCUMENTS AND ORDER OF PRECEDENCE

This document must be read together with RMS QA R300 – ITS Maintenance Services – General Requirements. Other relevant RMS Maintenance Specifications, RMS Equipment specifications, O&M manuals and Australian Standards are listed in **Annexure R317/A**.

In the event of any conflicting requirements between documents, the order of precedence must be:

1. Statutory and legislated requirements;
2. This Specification - RMS QA R300 together with R317 (this document);
3. Other RMS ITS Maintenance specifications;
4. RMS ITS Equipment specifications;
5. O&M manuals; and then
6. Australian Standards.

In the absence of specific requirements within this, other RMS Maintenance Specifications, RMS Equipment specifications or O&M manuals, Australian Standards must apply.

2 MAINTENANCE SERVICES

You must undertake maintenance services of the Communication Equipment in your Zone in accordance with the Scope of this document, and the approved Asset Maintenance Plan and Forward Works Program.

2.1 ASSET INSPECTION

Asset Inspection Services must include

- a) Route, ducting, equipment, housings and conductor condition,
- b) Comms operation at nodes and end services to confirm operating parameters,
- c) Equipment and system checks recommended by OEMs of comms equipment and their condition.

2.2 PLANNED MAINTENANCE

Planned Maintenance Services can be referred to sample checklists included in **Annexure R317/B & C** for;

- a) Preventative Service at least once every year
- b) Functional Check Service at least once every year

The Preventative and Functional Checks will be alternated so that you have a gap of six months between these tests

Comms systems are supplied by a number of Communication Service Providers and use standard hardware supplied by Original Equipment Manufacturers (OEMs). The Operation and maintenance manuals of the OEMs will be consulted along with the planned maintenance specs as required.

2.3 REACTIVE MAINTENANCE

2.3.1 Fault Attendance Service

You must provide a fault attendance service on a twenty-four (24) hours per day, seven (7) days per week basis for all Communication Systems faults.

Typical causes of Communication Systems faults include, but are not limited to,

- a) communication equipment malfunctions,
- b) wiring faults,
- c) electrostatic discharge (ESD),
- d) overheating,
- e) moisture or dust ingress,
- f) accident damage,
- g) storm damage, and
- h) vandalism.

All repair works must be in accordance with RMS Specifications listed in Clause 1.3 or as amended.

2.3.2 Procedure

You must make arrangements to continually monitor the Fault Management System(s) for Communication Systems such as ADSL, GSM and IP. The Contractor could use dedicated off the shelf application such as Solarwind to monitor these networks.

In addition since Comms are an essential part of the ITS devices network the Comms availability information may also be available from the systems, hosted by TMC, that currently include:

- CMCS FMS web page on the TMC intranet; and
- PEGA Case Manager.
- Telephone call from the designated RMS/TMC personel.

You will be provided with access (e.g. remote login via VPN if provision is available) to these systems. You may also develop your own software interface to read the CMCS “flat file” which is periodically updated with VDCS fault status. In that case you will be provided with access to the CMCS “flat file” and a description of its structure.

Upon fault notification, you must review the nature and urgency of the problem and prioritise your response. You must dispatch appropriately skilled resources to attend the site as soon as possible, but in any case within the specified response time.

Upon arriving on site you must notify the TMC and log the time of attendance in your Fault Management System together with your initial findings and any other relevant information (e.g. estimated time to repair). You must also notify the TMC by phone before leaving the site.

You must assess whether the condition of the site poses any safety hazards to motorists or the public and make the site safe as a matter of priority.

In the event of a power failure, you must first contact the electricity distributor from off-site to ascertain that the cause of the outage is upstream of the Comms System supply point/points. You must still ascertain from site that there are no other power equipment failures at the Comms System site/sites and then enter the appropriate fault response details in your fault management system.

2.3.3 Response Time and Repair Time

The response time starts from the initial fault occurrence time stamp in the appropriate electronic Fault Management System or from the time of the fault call (whichever is earlier) and is the sum of following;

- Remote investigation time to ascertain nature of defect(s)
- Equipment/parts/materials preparation time, and
- Travel time to site.

Response times for initial site attendance upon notification of a Comms fault is guided by the criterion in **Annexure R317/E**.

Service provider to locate maintenance crews to facilitate their travel time to site.

2.3.4 Repair time

Repair time at site is the time taken to trouble-shoot the fault, completely repair the asset and make it available for service. Asset downtime directly effects operational availability. Swift, efficient and well coordinated repairs will bring the asset back into operation quickly and positively affect performance targets.

You must inform RMS as soon as possible of any abnormal delays, reasons for delayed repairs and estimate of the time required to complete the repairs.

2.3.5 Repetitive Failures

Where the same reported fault requires callouts on three (3) occasions within a fourteen (14) day period you must carry out root cause analysis, identify and implement appropriate actions to prevent recurrence.

Where these actions recommend replacement or major renewal of the Communication Systems asset and these works have not been included in the current Forward Works Program (FWP) you must submit a Business Case to RMS for approval. The Business Case must be based on a life cycle cost comparison of the proposed action against a “business as usual” maintenance approach. If RMS agrees with your recommendations the renewal or replacement works will be included in the next FWP.

2.3.6 Requests for RMS Assistance

Where a technical problem cannot be resolved by you, you may request assistance from RMS. When requesting assistance you must be able to demonstrate to RMS that the technical problem is outside your scope of services, e.g. system integration issues with RMS or TMC systems, and Network Service Provider.

If the technical problem cannot be resolved by the RMS remotely, a site meeting will be arranged by RMS at a mutually agreeable time. You must attend the site meeting with relevant documents and information related to the technical problem.

2.4 INCIDENT SUPPORT

You must provide Incident Support when requested to do so by the TMC or by the relevant SMC Service Provider. Response time and repair time requirements must be as for Reactive Maintenance.

You must assess whether the condition of the site poses any safety hazards to the public and make the site safe as a matter of priority.

You must prioritise and rectify all other faults and defects as for Reactive Maintenance.

You must record the Incident Support details in PEGA Case Manager. If PEGA Case Manager is not available the report form in **Annexure R317/D** may be used on site. You must assist RMS with insurance claims and recovery action. Incident Support reports must be submitted as part of your monthly report to RMS.

3 PARTS AND EQUIPMENT

3.1 SUPPLY

You must supply all parts and equipment for the purpose of maintaining the Communication Equipment.

3.2 HOLDING STOCK

At all times, you must hold adequate stock levels of parts and equipment in storage for the Reactive Maintenance of the Communication Equipment, as documented in the agreed Asset Maintenance Plan.

3.3 DAMAGED, DEFECTIVE, OBSOLETE OR REDUNDANT EQUIPMENT

Damaged, defective, obsolete or redundant parts and equipment must be removed from the Work Site.

You may

- a) Repair or refurbish the parts or equipment and hold them as spares in store for future use; or

b) Dispose of the parts or equipment (recycle where possible)

in accordance with the agreed Asset Maintenance Plan.

4 PERFORMANCE REQUIREMENTS (ASSET SPECIFIC)

You must meet the included KRAs and KPIs for performance of your Services. Performance requirements which are specific to Communication Equipment are detailed below.

4.1 DESIGN LIFE

Your Asset Inspection and Planned Maintenance Services must support a design life for each Communication Systems asset of at least

- five (5) years for its power supply equipment,
- five (5) years for its power backup equipment and battery, including replacing, dating and tagging each battery with a durable label upon the battery reaching three (3) years from date on battery label or proof of purchase, expiry date of battery OEM's warranty, or 400 recharge cycles to 80% depth of charge, whichever is earlier,
- ten (10) years for its electronic, electrical and communications equipment, excluding the power supply system, and
- ten (10) years for its optoelectronic equipment, excluding the power supply system.

Premature asset failures requiring major renewal or replacement of the asset (other than due to Incidents or Force Majeure events) may reduce your Stewardship Overall Performance KPI score.

4.2 AVAILABILITY (OPERATIONAL)

RMS QA R300 defines Availability for ITS assets. Performance calculation method is provided in the contract. The performance target for Communication systems availability is at least 98.0% (if standalone) or as specified in RMS QA R301 (if part of TCS), or RMS QA R305 (if part of TFS), Whichever is higher.

Availability as defined in R300 will be measured monthly by you across all Communication system assets in your Zone.

Failure to meet the Availability performance targets will impact on your Asset Performance KPI score.

5 REPORTING AND RECORD KEEPING

5.1 REPORTING

You must provide a monthly performance report to RMS on work achievement against the FWP and asset performance statistics by the second week of the following month. The report must include the following items:

- (i) Availability

- (ii) Response Time
- (iii) Repair Effectiveness

See R300 for Availability, Response Time and Repair Effectiveness definitions.

You may use the service report forms in Annexure R317/B and R317/C or develop and agree to equivalent electronic reporting systems as part of your Asset Management systems.

You must report on the status of fault attendance and repairs through the appropriate Fault Management Systems in accordance with Clause 6.3 in R300.

5.2 RECORD KEEPING

You must keep and maintain accurate records of all calibrations, replacements, design alterations, and repairs made to any Communication Equipment.

All Functional Check Service and Preventive (Routine) Maintenance Service attendances must be clearly and legibly recorded in the record book within each Control Cabinet. Details of each attendance must include the date and the service carried out and the technician's name. Draw a line across the page after each report.

You must maintain appropriate records to support the monthly evaluation of actual performance against the performance targets.

You must retain records of all accident/damage repairs for a period of at least five (5) years.

ANNEXURE R317/A – REFERENCE DOCUMENTS

A1 RMS ITS MAINTENANCE SPECIFICATIONS

Not used.

A2 RMS ITS EQUIPMENT SPECIFICATIONS

TSI-SP-003	Communications Protocol For Roadside Devices
TSI-SP-016	General Requirements For Outdoor Electronic Equipment
TSI-SP-021	Modems For Dial-Up SCATS Communications
TSI-SP-022	General Performance Requirements For SCATS Communications

A3 O&M MANUALS

Refer to respective O&M Manuals based on make and model number of each Communication System.

A4 AUSTRALIAN STANDARDS

AS/NZS 2967	Optical Fibre Communication Cabling Systems Safety
.AS/NZS 61000	Electromagnetic Compatibility

**ANNEXURE R317/B – SAMPLE PREVENTATIVE ROUTINE
MAINTENANCE SERVICE REPORT**

COMMUNICATION SYSTEM ID:

LOCATION: REPORT DATE:

GPS LATITUDE..... GPS LONGITUDE.....

ITEM	PASSED	COMMENTS	FFA
1. Staff inducted, SWMS completed, attended tool box meeting onsite			
2. Before going to site contact TMC for road occupancy license (ROL)		ROL number: _____	
3. Contact TMC for clearance for maintenance			
4. Refer relevant O&M manuals. Checklist attached (Y/N)?			
5. Perform your proposed checklist. Checklist attached (Y/N)?			
6. Refer relevant O&M manuals. Checklist attached (Y/N)?			
7. Perform your proposed checklist. Checklist attached (Y/N)?			
8. Activate power supply equipment			
9. Activate power backup equipment			
10. Activate communication equipment			
11. Check if site is operational.			
12. Notify TMC of site status.			

NOTES:

1. Mark condition of each item with a ✓ in the “PASSED/FAILED/REPAIRED” columns.
2. If any item requires further attention, mark that item with a ✓ in the “for further action (FFA)” column.
3. Enter date in dd/mm/yy format and time in 24 hour format.

ANNEXURE R317/C – SAMPLE FUNCTIONAL CHECK SERVICE REPORT

COMMUNICATION SYSTEM ID:

LOCATION: REPORT DATE:

GPS LATITUDE..... GPS LONGITUDE.....

ITEM	PASSED	FAILED	REPAIRED	COMMENTS	FFA
Site					
13. Staff inducted, SWMS completed, attended tool box meeting onsite					
14. Before going to site contact TMC for road occupancy license (ROL)				ROL number: _____	
15. Contact TMC for clearance for maintenance					
Communication Equipment – CURRENTLY CHECKLIST NOT DEVELOPED; YOU MAY PROPOSE					
16. Refer relevant O&M manuals. Checklist attached (Y/N)?					
17. Perform your proposed checklist. Checklist attached (Y/N)?					
Power Backup Equipment – CURRENTLY CHECKLIST NOT DEVELOPED; YOU MAY PROPOSE					
18. Refer relevant O&M manuals. Checklist attached (Y/N)?					
19. Perform your proposed checklist. Checklist attached (Y/N)?					
Site - Sign-Off					
20. Activate power supply equipment					

Maintenance of Communication Systems

R317

21. Activate power backup equipment					
22. Activate communication equipment					
23. Check if site is operational.					
24. Notify TMC of site status.					

NOTES:

1. Mark condition of each item with a ✓ in the “PASSED/FAILED/REPAIRED” columns.
2. If any item requires further attention, mark that item with a ✓ in the “for further action (FFA)” column.
3. Enter date in dd/mm/yy format and time in 24 hour format.

TECHNICIAN: **COMPANY:**

SIGNATURE: **DATE SIGNED:**

DATE SENT TO RMS:

ANNEXURE R317/D – SAMPLE INCIDENT SUPPORT REPORT

CS ID: **LOCATION:**

INCIDENT DATE: **REPORT DATE:**

Incident Details	
When reported	
Who reported	
Was Incident or fault a dangerous situation? (Y/N)	
Police attendance? (Yes/No) Police Report #:	
Details of any vehicles involved	
Attending supervisor and team at site. Date and time.	
Immediate Safety measures taken. Date & time.	

Power Supply Point / post identification number	
Initial Repair undertaken. Date & time	
Details of long term repair. Whom forwarded to for action.	
Description of replaced equipment and cost of equipment plus materials	
Number of hours claimed for complete repair	
Notes & Comments	

TECHNICIAN: **COMPANY:**

SIGNATURE: **DATE SIGNED:**

DATE SENT TO RMS:

ANNEXURE R317/E – FAULT CODES AND RESPONSE TIMES

Response times for initial site attendance upon notification of Communication System faults are detailed in R300 (Clause 6.2.1 Response Times and **Annexure D**). R300 categorizes ITS assets as either High Priority or Normal Priority and assigns suitable response times.