

Certificate No. NESA-S038 **Version Number** 1.5

Approval date 24 May 2024

Approved by Head of Engineering Standards

This certificate is issued to

Owner Australian Rail Track Corporation

Supplier Lockheed Martin Australia Pty Limited. ABN 30 008 425 509

In respect of

Manufacturer Refer to Approved Item List.

Product description Advanced Train Management System (ATMS) – IS1.1

Item identification Refer to Approved Item List.

Application This Type Approval conditions are applicable to the operation, sustainment and support of the ATMS IS1 corridor. Network Control Centre West (NCCW) to manage the specific sections of Australian Rail Track Corporation (ARTC) managed rail network in South Australia between Spencer Junction (Exclusive) and Whyalla (Exclusive) corridor (ATMS IS1). This corridor is approximately 67kms in length which include a single 1800m passing loop at Roopena

- Relevant Standards**
- CENELEC EN 50126, Railway Applications - The Specification and Demonstration of Reliability, Availability, Maintainability, and Safety (RAMS), 15 December 1999.
 - CENELEC EN 50128, Railway Applications – Communications, signalling and processing systems – Software for railway control and protection systems, March 2001.
 - CENELEC EN 50129, Railway Applications – Communication, signalling and processing systems - Safety Related Electronic Systems for Signalling, February 2003.
 - CENELEC EN 50159-1:2001, Railway Applications – Communication, signalling and processing systems – Part 1: Safety-related communication in closed transmission systems
 - CENELEC EN 50159-2:2001, Railway Applications – Communication, signalling and processing systems – Part 2: Safety-related communication in closed transmission systems
 - Electronic Authority – Advanced Train Management System (ATMS) - Rules
 - ESD-08-02 Advanced Train Management System Trackside Signalling Design Principles.
 - OP-WI-02 Transition to and from Electric and Manual TOW
 - National Code of Practice for the Defined Interstate Rail Network Volumes I, II, III and draft Volumes IV and V
 - ESD-05-01, Common Signal Design Principles - S1 - Signalling Locking and Train Dynamics
 - ESD-05-12, Microlok II Design
 - ESM-26-02 Signal Technical Maintenance Plan

**NEW EQUIPMENT AND SYSTEM
APPROVAL CERTIFICATE**

- ATMS-2014-15-0004 ATMS System Configuration & Track Database Manual
- RMST-2015-13-0035 ATMS Railway Track Survey Requirements
- ESD-13-03 ATMS Equipment Data Management Guideline
- ESD-13-04 ATMS TIU Generic Application Logic Design Specification
- ESD-32-02 ATMS Equipped Train Braking Standard
- ATMS-2015-13-0085 ATMS TCS Installation and Configuration Manual
- SYS-WI-043 ATMS Configuration Requirements for Digicom Connect 3G WAN
- SYS-WI-044 ATMS Configuration Requirements for Cybertec 2150
- ESF-13-04 ATMS NCCW Deployment Configuration Management Plan
- ESM-13-01 ATMS Operational Support and Maintenance Guideline
- ATMS-2014-15-0002 ATMS Network Control Centre Maintenance Manual
- RMST-2014-15-0001 ATMS Trainborne Maintenance Manual

**Conditions of
Approval**

The following conditions of the approval must be adhered to:

TAC1.

Only components from the accompanying list (refer to the Approved Item List) shall be utilised in accordance to the Conditions of Use for each component. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [1]]

TAC2.

Operation of the ATMS is limited to within the ATMS Territory, which is defined as a section of ARTC managed rail network in South Australia between Spencer Junction (Exclusive) and Whyalla (Exclusive) line segment; approximately 67kms in length which include a single 1800m passing loop at Roopena. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [2] and Limitation [5]]

TAC3.

Operation of ATMS in ATMS Territory must be in accordance with the ATMS Rules. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitations [4]]

TAC4.

All network infrastructure on ATMS Territory (refer to TAC2) shall be designed and installed in accordance with standard ESD-08-02 v1.0 [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

TAC5.

Only Pacific National NR-class Locomotive is approved for fitment and operation of the ATMS Trainborne System. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

TAC6.

Only Train Consist Type of Steel Train that complies with ESD-32-02 - ATMS Equipped Train Braking Standard is approved for operation on ATMS Territory (refer to TAC2) as an ATMS equipped train under the ATMS Rules defined in the Electronic Authority – Advanced Train Management System (ATMS) (refer

NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

to TAC3). [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

TAC7.

During ATMS failure the Network Control Centre is required to utilise the work instruction in OP-WI-02 to transition to and from ATMS Manual Working. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [7] and Limitation [8]]

TAC8.

The application safety assumptions (marked as conditions of type approval) from Appendix H of the ATMS GASC must be reviewed annually against recent incidents to ensure the validity of the ATMS safety cases [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [3]]

TAC9.

NCC Maintainers must be assessed as competent against the ATMS related skills defined in EST2002F-09 – Control System Technician, and the NCC maintenance work must be performed in accordance with the instructions detailed in ATMS-2014-15-0002 - ATMS Network Control Centre Maintenance Manual. The compliant to EST2002F-09 – Control System Technician is waived by SG_0086. The maximum period between assessments to be no longer than three years. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1e Appendix C, Limitation [7] and Limitation [8]]

TAC10.

Trainborne maintenance work must be performed in accordance with the instructions detailed in RMST-2014-15-0001 - ATMS Trainborne Maintenance Manual. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [7] and Limitation [8]]

TAC11.

ATMS Engineer must be assessed as competent against the ATMS related skills in defined EST2002F-02 – Signal Design Engineer and/or EST2002F-03 – Signal Maintenance and Construction Engineer and/or EST2002F-08 – Control System Engineer, and the ATMS Engineer work must be performed in accordance with the instructions detailed in ATMS-2014-15-0004 - ATMS System Configuration & Track Database Manual and ATMS-2015-13-0085 - TCS Installation and Configuration Manual. The maximum period between assessments to be no longer than three years. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [7] and Limitation [8]]

TAC12.

The ATMS TIU application data shall be designed and installed in accordance with ESD-13-04 - ATMS TIU Generic Application Logic Design Specification. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

**NEW EQUIPMENT AND SYSTEM
APPROVAL CERTIFICATE****TAC13.**

The TOW logic are to be removed from all ATMS TIUs during the Operational Services, including an update to ESD-13-04 - ATMS TIU Generic Application Logic Design Specification. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

TAC14.

The IS1 Track Survey data must be collected according to RMST-2015-13-0035 - ATMS Railway Track Survey Requirements. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [5]]

TAC15.

The Work Authority, Shunt Authority, Track Occupancy Authority, Track Work Authority, Local Possession, and Train Running Information authority types must be disabled in ATMS. Changes to the list of disabled authorities shall require a variation to this type approval. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [1] and Limitation [5]]

TAC16.

ATMS Trackside Signal Engineering and Signal Maintainers. must be assessed as competent against the ATMS related skills as defined in EST2002F-02 – Signal Design Engineer, EST2002F-03 – Signal Maintenance & Construction Engineer and EST2002F-04 – Signal Electrician – Maintenance and Construction respectively. [Refer to ATMS IS1 - ISA Assessment Report – Deployment Phase Final Assessment #4 – Operational Services, Issue 1, Appendix C, Limitation [7] and Limitation [8]]

TAC17.

This approval is limited to the Wabtec Control Systems contracted period of maintenance and support with ARTC.

TAC18.

IS1.1 approval is subject to the limitations listed in ATMS (IS1.1) - ISA report – ATMS Product, Commissioning and Interim Operational Service - Issue 2 (Document No ARC-618-018-R01).

A general condition of approval is that the supplier remains accredited to ISO 9001 specifically for these products and ARTC is advised on a 12 monthly basis that accreditation is current.

Any subsequent change to the design, materials or manufacturing process is not covered by this approval. The manufacturer should notify ARTC of any modification or changes in order to obtain a valid certificate.

Issue date 24/05/2024

Expiry date N/A

Issued by

ARTC Manager Signalling Standards

Approved Item List

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Network Control System	TCS	TCS Software	N/A	Lockheed Martin/Hitachi	N/A	7.4.1	Refer ATMS-2017-13-0022 SVD for ATMS System Build, Rev E for comprehensive list of authorized TCS software.
ATMS	Network Control System	N/A	ATMS Engineering Terminal	N/A	Lockheed Martin	N/A	N/A	Refer ATMS-2017-13-0022 SVD for ATMS System Build, Rev E for comprehensive list of authorized ATMS Engineering Terminal software.
ATMS	Network Control System	AMS	AMS Software	N/A	Lockheed Martin	N/A	7.10.0	Refer ATMS-2017-13-0022 SVD for ATMS System Build, Rev E for comprehensive list of authorized AMS software.
ATMS	Network Control System	AMS	AMS 1 RU Plenum - Assembly	N/A	Lockheed Martin	ATMS-S0074	B	N/A
ATMS	Network Control System	AMS	AMS 1 RU Plenum - Assembly	Front Panel	Lockheed Martin	ATMS-S0075	B	N/A
ATMS	Network Control System	AMS	AMS 1 RU Plenum - Assembly	Folded Tray	Lockheed Martin	ATMS-S0076	B	N/A
ATMS	Network Control System	AMS	AMS 1 RU Plenum - Assembly	Blanking Plate	Lockheed Martin	ATMS-S0096	B	N/A
ATMS	Network Control System	AMS	AMS 1 RU Plenum - Assembly	Blanking Plate Assembly	Lockheed Martin	ATMS-S0097	B	N/A
ATMS	Network Control System	AMS	AMS 2 RU Inlet – Assembly	N/A	Lockheed Martin	ATMS-S0077	B	N/A

NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Network Control System	AMS	AMS 2 RU Inlet – Assembly	Front Panel	Lockheed Martin	ATMS-S0078	B	N/A
ATMS	Network Control System	AMS	AMS 2 RU Inlet – Assembly	Folded Tray	Lockheed Martin	ATMS-S0079	B	N/A
ATMS	Network Control System	AMS	AMS 2 RU Exhaust - Assembly	N/A	Lockheed Martin	ATMS-S0080	B	N/A
ATMS	Network Control System	AMS	AMS 2 RU Exhaust - Assembly	Front Panel	Lockheed Martin	ATMS-S0081	B	N/A
ATMS	Network Control System	AMS	AMS 2 RU Exhaust - Assembly	Folded Tray	Lockheed Martin	ATMS-S0082	B	N/A
ATMS	Network Control System	AMS	AMS 6 Intelligent Fan Tray	N/A	Verotec	28-4000-392	N/A	N/A
ATMS	Network Control System	AMS	AMS Dummy Sensor Front and Rear	N/A	Verotec	919-4000-396	N/A	N/A
ATMS	Network Control System	AMS	AMS Grounding Cables	N/A	Lockheed Martin	ATMS-S0102	A	N/A
ATMS	Network Control System	AMS	AMS D602 Ethernet Cable	AMS HDSUB to 2xRJ45 Cable	MEN Micro	05P511-00	N/A	N/A
ATMS	Network Control System	AMS	AMS Chassis	N/A	MEN Micro	190036-01	01.10.00	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Ethernet Switch A and B	MEN Micro	02F301-00	0.01.00	N/A



NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Network Control System	AMS	AMS Chassis	AMS Alarm Output PSU	MEN Micro	13100-045	N/A	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Validation Server D602	MEN Micro	02D602-00	03.03.00	This board has triple redundant PowerPC 750 CPUs running at 1GHz and triple redundant 512 MiB DDR RAM. The three CPUs operate in lockstep and perform the same operations at the same time. Two out of three voting is implemented in FPGA for both the CPU and the RAM. Additionally, a P511 Ethernet card with dual ports and a D203 carrier card are mounted on the D602. The D203 carrier card allows access to the M66 digital I/O card.
ATMS	Network Control System	AMS	AMS Chassis	AMS Validation Server Network Card	MEN Micro	15P511-00	00.05.00	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Validation Server 32-Bit Binary I/O M-Module	MEN Micro	04M066-00	03.02.00	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Validation Server 6U MMOD. Carrier	MEN Micro	02D203-00	01.01.00	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Validation Server PSU A and B	MEN Micro	13100-141	N/A	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Proposal Server A and B CPU, Core 2 Duo	MEN Micro	02F019P01	02.02.00	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Proposal Server A and B 2.5" Hard Drive Carrier	MEN Micro	02G501-00 or 02G501-10	N/A	N/A



NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Network Control System	AMS	AMS Chassis	AMS Proposal Server A and B AMS 2.5" Hard Drive 500GB 5400RPM	MEN Micro	6101-0060 or 6101-0081	N/A	N/A
ATMS	Network Control System	AMS	AMS Chassis	AMS Proposal Server A and B PSU	MEN Micro	13100-141	N/A	N/A
ATMS	Trainborne System	TC&D	TC&D Software	N/A	Lockheed Martin	N/A	6.6.0	Refer ATMS-2017-13-0022 SVD for ATMS System Build, Rev E for comprehensive list of authorized TC&D software.
ATMS	Trainborne System	TC&D	Locomotive Display Unit / Driver Machine Interface	DMI Computer, PC, Ruggedized	MEN Micro	09DC02-07	N/A	N/A
ATMS	Trainborne System	TC&D	Locomotive Display Unit / Driver Machine Interface	DMI Ethernet Cable	Lockheed Martin	6621-312361-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	Locomotive Display Unit	DMI Power Cable	Lockheed Martin	6621-312502-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	N/A	HOT/EOT Pressure Sensor Cable	Lockheed Martin	6621-312338-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	N/A	Loco Interface and Power Cable	Lockheed Martin	6621-312345-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	Head-of-Train	HOT Device	Lockheed Martin	29221-PA-CA	1.18.2	N/A
ATMS	Trainborne System	TC&D	Head-of-Train	HOT Antenna Cable	Lockheed Martin	47687-CP-AA	N/A	N/A
ATMS	Trainborne System	TC&D	Head-of-Train	HOT Power, CDU 72v Cable	Lockheed Martin	47253-CP-AA	N/A	N/A
ATMS	Trainborne System	TC&D	End-of-Train	EOT Device	Lockheed Martin	29220-PA-BA	N/A	N/A
ATMS	Trainborne System	TC&D	End-of-Train	EOT Air Hose	Lockheed Martin	31343-CP-AA	N/A	N/A

NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Trainborne System	TC&D	BPP Sensor A and B	N/A	ABB Inc	268HSPSBA8N4	N/A	N/A
ATMS	Trainborne System	TC&D	Locomotive Junction Box Assembly	N/A	Lockheed Martin	20542648-501	N/A	N/A
ATMS	Trainborne System	TC&D	Secure Acknowledge/ Recessed Confirmation Button	N/A	EATON AEROSPACE	10250T30B	N/A	N/A
ATMS	Trainborne System	TC&D	Bypass Switch Assembly	N/A	Lockheed Martin	20542649-501	N/A	N/A
ATMS	Trainborne System	TC&D	Cable, LCU Bypass	N/A	Lockheed Martin	6621-312500-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	Cable, 18 Conductor	N/A	Lockheed Martin	6621-312501-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	TC&D	Locomotive Control Unit (LCU)	LCU	Lockheed Martin	20538025-501	A	N/A
ATMS	Trainborne System	TC&D	Locomotive Control Unit (LCU)	LCU Antenna	Lockheed Martin	23089-CP-AA	N/A	N/A
ATMS	Trainborne System	LDS	LDS Software	N/A	Lockheed Martin	N/A	5.6.0	Refer ATMS-2017-13-0022 SVD for ATMS System Build, Rev E for comprehensive list of authorized LDS software.
ATMS	Trainborne System	LDS	GPS Multiband Antenna	Primary and Secondary	Mobile Mark	SMW-UMB-3A3K2W-WHT-18	N/A	N/A
ATMS	Trainborne System	LDS	GPS Multiband Antenna Primary	RF GPS, Primary Antenna Cable	Lockheed Martin	6621-312505-5	N/A	PN NR-class Locomotive
ATMS	Trainborne System	LDS	GPS Multiband Antenna Secondary	RF GPS, Secondary Antenna Cable	Lockheed Martin	6621-312505-6	N/A	PN NR-class Locomotive
ATMS	Trainborne System	LDS	GPS Multiband Antenna	RF Cellular Cable	Lockheed Martin	6621-312511-5	N/A	PN NR-class Locomotive

NEW EQUIPMENT AND SYSTEM APPROVAL CERTIFICATE

System	Sub System	Element	Component	Sub-Component	Manufacturer	Part Number	Version	Conditions of Use
ATMS	Trainborne System	ATMS Communication System	Trainborne Modem	Digicom Connect 3G WAN	Digicom	DC-WAN-E300-W	N/A	N/A
ATMS	Trainborne System	ATMS Communication System	Trainborne 3G Module	Telit HE910	Telit	HE910-D	N/A	N/A
ATMS	Trackside System	TIU	TIU Executive	N/A	Union Switch and Signal Inc	N17061301	8.3	Base board N17003401. Ensure correct executive software version is loaded before installation.
ATMS	Trackside System	TIU	Local Control Panel	Safety Door Switch	Omron	D4DS	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	LED Indicator - Green	RS Pro	211-279	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	LED Indicator – Red	RS Pro	210-490	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	LED Indicator – Yellow	RS Pro	211-140	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	Green Push Button	Schneider	ZB4BA3	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	Yellow Push Button	Schneider	ZB4BA5	N/A	N/A
ATMS	Trackside System	TIU	Local Control Panel	Hold Push Button	Schneider	ZB4BZ105	N/A	N/A
ATMS	Trackside System	TIU	Powersafe Electrical Switch	Key Operated Switch	Castell	KS20	N/A	N/A