

## STANDARDS and SYSTEMS

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### Engineering Standards and Documents

The following recommendation, together with the attached supporting documentation, has been considered at the ARTC Risk & Safety Committee Meeting held on 8<sup>th</sup> October 2007 and subsequent correction to the attached “Consolidated list of predecessor type approvals” considered by the Manager Standards on 11<sup>th</sup> April 2008 and 24<sup>th</sup> September 2008.

#### *Documents:*

Ref No:	08-08-10-066 - System & Equipment Approval
Subject:	Signalling Equipment approved by predecessor authorities.
Dated:	18 <sup>th</sup> April 2007.

Prepared By: Arthur Haberlin, Signalling Engineer

Endorsed by: Trevor Moore, Signalling Standards Engineer

#### *Items Considered for Approval:*

Manufacturer:	Multiple
Product:	Signalling Equipment Items
Item Identification:	See list Ref. No. 00-0704-054b.

The items covered by predecessor authorities at the review date were approved for System & Equipment Approval to be used on various ARTC jurisdictions in accordance with the manufacturers published performance criteria and subject to the following.

#### *Relevant ARTC Specifications:*

Ref. No.	Title	Status	Date
PP-122	New Equipment and Systems Approval	Issue 1 Revision 3	August '04
SCP 14	Type Approval Requirements for Signalling Systems and Equipment	Issue 1 Revision 2	March '05

#### *Specific Conditions of Approval:*

- i. Only equipment items having type approval granted by 'Predecessor Authorities' prior to 1<sup>st</sup> January 2007 are covered by this certificate for use as part of the ARTC signalling infrastructure.
- ii. Any equipment items covered by this approval are accepted only for the duty outlined and under any conditions of use incorporated into the type approval issued by the 'Predecessor Authority'.
- iii. Type approval for equipment granted by a 'Predecessor Authority' and accepted by ARTC in accordance with the above conditions **i & ii**, is considered as applying retrospectively from the date at which ARTC took control of the infrastructure at which the equipment is commissioned.
- iv. New works shall be designed to use type approved equipment in accordance with ARTC standard signalling principles, standard circuitry and standard installation practices for the location in which the equipment will be installed.
- v. Equipment items installed as part of the ARTC signalling infrastructure at the date of this certificate which are covered by predecessor approval and subsequently by specific ARTC type approval may continue in use under the predecessor approval (and be replaced like for like during maintenance) even where such use conflicts with the conditions of the ARTC type approval.
- vi. Where equipment is to be used in new works under type approval by a 'Predecessor Authority' (with no specific ARTC type approval) then the designers shall justify that the application is equivalent to an existing installation for which the predecessor authority is valid.
- vii. Any equipment used in any new installation which is type approved by predecessor approval and also by specific ARTC type approval shall conform to the ARTC approval conditions only in the new installation.

***Certificate Issued to:***

Exec. Manager Standards & Systems  
 Australian Rail track Corporation Ltd.  
 Off Sir Donald Bradman Drive  
 Passenger Rail Terminal Rd.  
 Mile End  
 South Australia 5031

See list **00-0704-054b** for all identified items covered by specific condition **i** above. Any subsequent change to the design, materials or manufacturing process is not covered by this approval.

Approved for use in the ARTC.



24/09/2008

John Furness  
 Manager Standards

**APPROVAL No: 08-08-10-066**

**Approval Date: 8<sup>th</sup> October 2007.**

Ref No: 00-0704-054c

Date: 24<sup>th</sup> September 2008

**Equipment Type Approval**  
**Subject: 'ARTC' Consolidated list of predecessor type approvals**

The following lists the individual type approval numbers of Signalling Equipment manufactured by various makers which have been issued by ARTC predecessor organisations and which are hereby extended to apply on ARTC infrastructure under Type Approval Certificate **08-08-10-066** subject only to any conditions shown on that Certificate and the Conditions of Use from the original approval certificates.

**R.I.C./RailCorp approvals use \*... reference; Thiess Infraco approvals use TAC... reference; Connex approvals use CML... reference; Pacific National approvals use PN... reference; Freight Australia approvals use FAIM... reference.**

**ABW Engineering**

Ref. No.	Categories	Items	Approval Date
*96/p281	Track Circuits	AC 6 ohm track resistor	Prior to 01/06/1996
*96/p282		AC Feed Transformer, Store 47	
*96/p286		DC Track feed set - Store 72	
*96/p289		DC Track feed set - Store 70	
*96/p346	Power Supply	Store 74 ,12V dc, 20 amp	
*96/p347		Store 74,12V dc, 30 amp and 40 amp	
*96/p348		Store 103 50V dc, 2.5 amp	
*06/0303	Trackside Installation.	Steel plates designed to be installed on the concrete sleepers and cover cables against risks of damage.	15/03/2006

**Aldridge**

Ref. No	Categories	Items	Approval Date
*96/p319	Signals	Signal Heads - Main	Prior to 01/06/1996
*96/p322		Signal Heads - shunt & subsidiary	
*96/p325		Signal Head - running turnout	
*96/p328		Signal head - tunnel, LED lamp unit	
*96/p334		Route indicator - stencil	
*01/0301		Repeat Signal (4 White Lights)	22/03/2001
*02/0702		LED (Light Blue), Guards Indicator	24/07/2002
*02/1201		LED Stencil 'U' light for 120Vac	11/12/2002
*03/0402		LED Subsidiary 127mm signals R,Y,G & W for 120Vac, for outdoor use.	03/04/2003
*03/0403		LED Stencil 2 route indicator 125mm for 120Vac	03/04/2003 Superseded by NES-A-S019 (v1.0)
TAC 8		Multi aspect colour light signal model RW303W	20/09/1995
*03/0603	Signals, Light units	LED 'A' Light 200mm for 120Vac, Relay Interlocking only. Outdoor use.	13/06/2003
*01/1204	Signals, Light units	<del>Main Line daylight LED signal RL400 series 212mm 120VAC Red, Yellow, and Green.</del>	17/12/2001 Superseded by NES-A-S019 (v1.0)
*04/0702		Main line signals new design 213mm new power board and LED board design	2004
*04/0903		LED Power Supply Module. Model RL403*/1 & 2. Where /1 denotes the present LED boards.	30/09/2004
*05/0601		LED Power Supply Module. Model	01/06/2005

		PS0181. Application is 7 x 7 array LED style MLRI only.	
*01/0602	Level crossing equipment	Level crossing advance warning light – yellow LED 125 or 200 mm diameter 12v (8 – 18) DC.	29/06/2001
*02/0601		RL241 series 120VAC LED Standing man red pedestrian light.	05/06/2002

#### **Ansaldo\_{U.S.& S.\_C.S.E.E.}**

Ref. No	Categories	Items	Approval Date
*96/p275	Track Circuits	Jointless Audio Frequency track circuit, CSEE model UM71.	Prior to 01/06/1996
TAC 30	Relays	UM71 Track Relay, Plug-in, CSEE model NS1-24-4.04	03/04/1996
*98/0801	Control systems	U.S.& S. Train Control System, TDPro	31/02/2002

#### **Bombardier\_{ABB ADtranz Ericsson ML}**

Ref. No	Categories	Items	Approval Date
*98/0903	Test equipment	ABB Combined Insulation & Continuity testing unit ABB Signal BELL-MEGGER BM-	28/09/1998
*99/0703	Track Circuits	TI21 Main Line Jointless A?F Track Circuit. Adtranz	15/07/1999
*01/0201	Points equipment	In-bearer points mechanism, 'Ebiswitch' Up to 25 Tonne axle load.	28-Feb-01
*96/p315		Detector (1, 2 & 3 slide), ABB-ML	Prior to 01/06/1996
*96/p330	Signals	Dwarf Position Light shunt signal (3 incandescent lamp), ABB-ML	

#### **BP Solar Australia**

Ref. No	Categories	Items	Approval Date
TAC12	Power Supplies	Solar Module, BP model BP275	04/10/1995
TAC13		12 Volt Reg for BP Solar Module	04/10/1995

#### **Cable Accessories**

Ref. No	Categories	Items	Approval Date
*05/0701	Cable	A/F Track Circuit connection, Aluminium cable pair complete with terminal crimped	14/07/2005
*96/p238	Cable Lugs	Insulated lugs	Prior to 01/06/1996
*96/p243		Non-insulated tubular lugs	
*96/p246		Cast traction lugs	
*96/p249	Crimping Tool	Crimping tool - multi-jaw (modified), model HP3, HP3/1 (modified),	
*97/0402		Crimp tool (range 6-50sqmm hex crimp)	17/04/1997

#### **Cambridge Technologies**

Ref. No	Categories	Items	Approval Date
*01/0901	CBI wiring	ETFE Teflon insulated twisted pair for safety wiring Microlock / CBI systems. Part Mil-W22759-16/16-0+9 greater than 15 twists per metre.	05/09/2001
*01/0902		ETFE Teflon insulated single conductor for safety wiring Microlock / CBI systems. Part 16ACFZ-1929; 19/29awg, 1.23mm <sup>2</sup> .	05/09/2002

**Exelectronics**

Ref. No	Categories	Items	Approval Date
*96/p247	Cables, terminal lugs and tools	Cast traction lugs, Exelectronics	Prior to 01/06/1996
*96/p248		Crimping tool - multi-jaw (modified), Exelectronics, Klippon CT16 (modified)	
*96/p288	Track circuit, components	DC Track feed set - Store 72-Q, 6 volt, 1 amp, 2-unit Q-rack mounting, EXT, * Exelectronics	
*98/0902	Power supply	Store 93 Power Supply manufactured by Exelectronics	23/09/1998

**GE Transportation Signalling {EPC Harmon Rail Signalling Services}**

Ref. No	Categories	Items	Approval Date
*97/0502 TAC 55/97	Track Circuits	TD4 track Circuit AC/DC Track Circuit	12/05/1997 17/09/1997
TAC 11		DC pulse coded Track Circuit; Harmon model ElectroCode 4	04/10/1995
TAC 21 (*97/013)	Level crossing equipment	Grade Crossing Predictor, Harmon model HXP3	15/10/1995 (provisional)
TAC 45		Flashing Light Assembly; model 300A	09/01/1997
TAC 64/98		Flashing Light Retrofit unit.	14/05/1998
TAC 67/98		Electronic Bell	14/05/1998
*97/1203 TAC 005-2000		Aluminium - Fibreglass level crossing road boom barrier arm. Harmon model NEG8006A	22/12/1997 17/08/2000
TAC 9	Vehicle Detector	Presence Detector; model 2500	03/10/1995
TAC 0022000	Signals, Light Unit	110V AC - LED Searchlight Retrofit kit. Red/Yellow/Green 200mm.	23/05/2000

**Invensys {Dimetronics Safetran Westinghouse}**

Ref. No	Categories	Items	Approval Date
*00/0202	Signals, Light units	127mm diameter 36 LED signal unit (White). WSA model No. TR3-WCFB301A Not to be used as Guards	18/02/2000 (28/04/2004)
*00/0701		127mm diameter 36 LED signal units (R, Y & G). WSA model No. TR3-xCFB301A Short range for Tunnel use, 120V ac.	05/03/2001
CML 002		127mm diameter 36 LED signal unit (Blue). WSA model No. TR3-BCFB301v Short range, 12V dc or 120V ac.	09/11/2004
CML 003		127mm diameter LED signal unit (Blue). WSA model No. TR3-BCFB501v Spread beam medium range, 12V dc or 120V ac.	09/11/2004
*01/1207		127mm diameter LED signal (R, Y & G) WSA model No. TR3-xCFB501A. Medium range for subsidiary signals, 120V ac.	2001
*03/0801		140mm diameter LED indicator unit (White). WSA model No. TR3-WCFB501A Outdoor use for Warning light, 120V ac.	13/08/2003

TAC 75/98		Safetran, Multi Aspect Signal, Retro-fit insert LED: standard.	18/09/1998
TAC 76/98		Safetran, Multi Aspect Signal, Retro-fit insert LED: collimated.	18/09/1998
TAC 77/98		Safetran, Multi Aspect Signal, Retro-fit insert LED: super-collimated.	18/09/1998
TAC 001-2000 TAC 13		Safetran, 136 mm diameter 90 LED U- type Colour Light Signal (R, Y, G & W), Medium range, 85-135V ac.	27/04/2000
TAC 0142000		Tricolour Retro-fit Kit LED: for GRS and MK&H signals, WSA data sheet 1A -13.	<b>Withdrawn</b>
*03/0902 CML 006		Tricolour LED light unit: 120V ac, Relay Interlocking only (Range 1km). WSA model RM4-TRFB75_A	<b>Withdrawn</b>
*04/0301		Westinghouse, Tricolour LED searchlight replacement: 12V dc, Relay Interlocking only.	<b>Withdrawn</b>
CML 003		127mm diameter LED signal unit (Blue). WSA model TR3-BCFB501v Spread beam medium range, 12V dc or 120V ac.	09/11/2004
TAC 0132000		210mm diameter 88 LED signal unit (White), Medium spread, for route indicator light. 88-135V ac. WSA model RM4-WCFB25-A	30/10/2000

**Invensys\_{Dimetronics\_Safetran\_Westinghouse} (continued)**

Ref. No	Categories	Items	Approval Date
*96/p318	Signals	Signal head - Main, WB&S	Prior to 01/06/1996
*96/p323		Signal head - shunt & subsidiary, WB&S	
*96/p326		Signal head - running turnout, WB&S	
*96/p327		Signal head - tunnel, WB&S	
*96/p329		Shunt / Point Indicator, WB&S	
*96/p331		Dwarf Position Light (3 lamp), WB&S	
*96/p335		Route indicator - stencil, WB&S	
*98/0202		Mainline signal lamp cases. WB&S models R20 and RL20	
*05/0302		Lightweight 5" post mounted shunt signal & Tunnel signal LED. WSA Model U2L. Data sheet 1A-19	11/03/2005
*05/0303 CML 025		Lightweight 8" main signal LED case. WSA Style 'L'. 2 aspect Dwg. 2101-189, 3 aspect Dwg. 2101-190.	28/03/2005
*05/0305		Repeater Signal, main line, LED. WSA Dwg. 2101-078, with 'TR3-WCFB301-A' light units & 600mm case.	28/03/2005
*04/0802 CML 023		Theatre Type Route Indicator LED type. WSA model TRI-L. Displays to suit each application.	18/03/2004
*04/1101 CML 005 CML 026 CML 027		Stencil Type Route Indicator Miniature LED. WSA model SRI-L.	03/11/2004 09/11/2004
*05/0201		Turnout Repeater, main line. Full size WSA outdoor LED.	10/02/2005
TAC 72/98		Safetran, Multi Aspect Signal, LED: standard.	18/09/1998
TAC 73/98		Safetran, Multi Aspect Signal, LED: collimated.	18/09/1998

TAC 74/98		Safetran, Multi Aspect Signal, LED: supercollimated.	18/09/1998	
TAC 12001	Telemetry	Westinghouse, Spread spectrum radio or local network vital telemetry. HD/Link	04/12/2001	
*96/p379 PN:0078		Serial multidrop system complete. WB&S model S2	Prior to 01/06/1996	
TAC 66/98	Level Crossing equipment	Safetran, Event Recorder No. A80250	14/05/1998	
*02/0705		Westinghouse, Road Crossing Boom Gate Light LED	24/07/2002	
*03/1201		Safetran, S40 Level Crossing Boom Gate Mechanism	10/12/2003	
*00/1002		Westinghouse, Level Crossing Electronic Highway Warning Bell	19/10/2000	
*96/p122		Level Crossing 200mm LED light units. WSA model RG4-RTFB25B48V11	Prior to 01/06/1996	
*96/0502		Lamp flasher; WSA model 'SAFEFLASH'	01/05/1996	
*96/0501 96/p278		Track circuits	L/F Traction Immune jointed track circuit complete. WSA model FS2600	01/05/1996
*96/p276			A/F Jointless track circuit complete, WB&S model FS2500	Prior to 01/06/1996
*96/p280	Wabco, High voltage Impulse track circuit complete, Pulsat			
*96/p283	Track circuit, components	DC 2 ohm track resistor,WB&S	Prior to 01/06/1996	
*96/p284		DC 4 ohm track resistor,WB&S		
*96/p285		DC Track feed - Store 72, WB&S		
*96/p287		DC Track feed - Store 72-Q, 6 volt, 1amp, Q mounting, WB&S		
*96/p290		DC - AC Immune,Track feed set; Spec. BR 867, WB&S model RA5-9		
*96/p73	Relays, Vital	AC Track Circuit, Vane Plug-in, WB&S model VT1	Prior to 01/06/1996	
*96/p74		DC Track Circuit, Full-size Plug-in, WB&S model BT1B		
*96/p75		DC Track Circuit, Shelf, WB&S model DN11		
CML 035		Current proving relay for LED signals. WSA model QECX20	15/05/2006	
*04/0201	Points equipment	Detector box (HM3) and rodding modified for Swing Nose crossing with ClawLock drive - WBS drg 3301-186	23/02/2004	
*96/p314		Detector Box, WB&S Style U5A	Prior to 01/06/1996	
*96/p316		Detector box, WB&S, HM2, HM3		
*96/p349	Power supply	50V dc, 2.5 amp, Store 103, WB&S	08/05/2002	
*96/p352		24V dc, 4.4 amp, JTC PSU, WB&S		
*02/0501		UPS, Parrallel Module, External Battery cabinet, Line isolation transformer, and associated surge protection equipment. Powerware model SPM9305		
*96/p124	Interlocking systems	CBI; BRB-SSI central interlocking units, WB&S model Mk2, For high traffic areas	Prior to 01/06/1996	
*97/0401		CBI; BRB-SSI Signal,Points and Data Link Modules, WSA model MarkIIIA	04/04/1997	
*97/1101		CBI; BRB-SSI Processor (MPM) and Memory Modules, WSA model MkIII	04/11/1997	

**Leonard Industries**

Ref. No	Categories	Items	Approval Date
*02/0502	Measuring Tool	Rail Current Sensors for measurement of rail currents	23/05/2002
*05/0501		Track Shunt Tester, Pulse Integrator, Audio Frequency Track Circuit Meter, AF Track Circuit Filter Adapter, Rail Current Meter, Shunt-20K, Lightning arrestor/varistor tester; etc in accordance with appropriate Rail Corp performance specifications.	Prior to 01/01/1996
*04/0801	Power Supplies	12V Voltage regulator	06/08/2004
*98/1001	P/Supply Monitoring	Battery Voltage Monitor & Alarm (type-	13/10/1998
*96/0504		Earth Leakage detector 50-650V ac/dc (type-LE51)	24/05/1996 (30/09/1998)

**M&H Power Systems**

Ref. No	Categories	Items	Approval Date
FAIM: 00013	Power supplies	Battery Chargers. M+H Specification 410MHP048	31/10/03
FAIM: 00026		Battery Charger, 24V 8A . M+H Specification 410MHP050-1	26/04/2004
TAC 0012003		Temperature Compensated Battery Charger.	15/04/2003
TAC91/99		12V Circuit Board Retro Fit into 5B1996 25A Battery Chargers. Mod 1.	06/05/1999
TAC93/99		24V Circuit Board Retro Fit into 11B1996 20A Battery Chargers. Mod 2.	06/05/1999

**Nippon Signal**

Ref. No	Categories	Items	Approval Date
*96/p307	Points, machines	120V ac 1ph, model KA1211C	Prior to 01/06/1996
*96/p308		120V ac 1ph, model KA1211B	
*96/p309		120V ac 1ph, Trailable model KA1401C	

**Omron**

Ref. No	Categories	Items	Approval Date
*04/0603	Relays (Non-vital)	Solid state timer H3YN -4 DC 12	03/06/2004
FAIM: 00021	Telemetry	Base Station Telemetry Unit	11/12/2003
*05/0404	Power supply	24V dc switch mode; Model S8VS 24024 and the S8VS series; (Superceding Model S82K previously approved)	14/04/2005

**TYCO {AMP Critchley P&B Raychem UTILUX}**

Ref. No	Categories	Items	Approval Date
*96/p128	Cable, Jointing	Heat-shrink kits and materials as listed in Specification 1062, Raychem, XAGA	Prior to 01/06/1996
*96/p241	Cable Lugs	Faston lugs for NCO equipment (Jeumont Schneider & CSEE), AMP model 110	
*96/p237		Insulated lugs, Utilux	
*96/p242		Non-insulated tubular lugs, Utilux	

**United Group\_{Alstom\_GEC\_Jeumont-Schneider}**

Ref. No	Categories	Items	Approval Date
*96/p317	Signals	Signal Heads - Main, GEC-Alsthom	Prior to 01/06/1996
*96/p321		Signal Heads - shunt & subsidiary, GECAlsthom	
*96/p324		Signal Heads - running turnout, GECAlsthom	
*96/p333		Route indicator - stencil, GEC-Alsthom	
*96/0503		Junction Route Indicator. GEC	17/05/1996

**United Group\_{Alstom\_GEC\_Jeumont-Schneider}(continued)**

Ref. No	Categories	Items	Approval Date
*99/0702	Signals	Main line route indicator, fibre optic. Alstom	08/07/1999
*00/1201		Turnout Repeater LED (L/H, R/H & Both). Alstom	08/12/2000
*02/0703		Guards Indicator (Light Blue). Alstom Australia LED units R999-X0957	24/07/2002
*02/0706		Signal Repeater, reverse 'L'. Alstom Australia LED units R999-X1093	24/07/2002
*96/p279	Track Circuits	High voltage Impulse track circuit, complete. Jeumont-Schneider.	Prior to 01/06/1996
*96/p76	Relays, Vital	Track Circuit relay, Jeumont-Schneider model NCO CVTH 2.4.04	
*96/p125	Interlocking systems	CBI; BRB-SSI, GEC-Alstom Signalling Limited (GASL) Mk2, For high traffic areas.	30/10/1998
*98/1003		CBI; BRB-SSI, GASL Mk3, Processor (MPM) type SS1003 (Mod State 1). Memory Module Type SS1331, Interlocking Program AL4303 (Issue G2). DWS Memory Module Type SS1333, Single Channel DWS Program AL4373 (Issue G2).	
*98/1004		CBI; BRB-SSI, GASL Mk3, Signal Modules Type SS3303 (Mod State 3, Issue state 4, BR Mod state 1). Software Version C4. Points Modules Type SS3103 (Mod State 1, Issue state 2, BR Mod state 1). Software Version C2.	
*99/0303		CBI; BRB-SSI, GASL Mk3; Re-issue of approval certificate *98/1003. Corrected naming and added approval for D2 & D4 software for use with the Mk2A SS1002A.	
*99/0304	Interlocking systems	CBI; BRB-SSI, GASL Mk3; Re-issue of approval certificate *98/1004. Corrected naming and removed wire spacing requirement.	24/03/1999
*02/0101		CBI; BRB-SSI, GASL Data Link Isolation Transformer.	01/12/2001
TAC 31	Relays, Non-vital	Twin time delay, 50V dc; GEC-Alsthom / Gayrad model 9B2000.	16/04/1996

*99/0403 *03/0602	Control systems	Signalling Operator Interface and 'Train Visibility' system. Alstom; SigView	1999 2003
CML 011		Lline driver; Alstom; 'Gentec 2'.	08/12/0224
*96/p371		Alstom PMUX	Prior to 01/06/1996
*96/p372		Alstom Sigmap	
CML 036		Adam 4520 converter for non vital circuitry and use with sigmap and sigview	16/05/2006
*01/1208	Level Crossing equipment	212mm Highway warning lights, LED units. Alstom model FL-03.	2001
*03/0301		Pedestrian Level Crossing standing man Don't Walk LED red light unit, 12V dc. Alstom Australia	07/03/2003
*06/0901	Level Crossing equipment	Pedestrian Level Crossing standing man	09/09/2006
TAC 33	Point Machine	GASL Heavy Rail point machine model LZW (PTC version).	12/06/1996
*96/p359	Power Supply	Earth Leakage Detector 120V ac busbar, GEC model XG 1902	Prior to 01/06/1996
*96/p353		24V dc, 4.4 amp JTC Power Supply Unit. GEC-Alsthom / Gayrad.	
*97/802		Store 93 power supply, (Restricted approval). GEC-Alsthom / Gayrad	05/08/1997

#### Vinidex

Ref. No	Categories	Items	Approval Date
*03/0401	Cable Route Materials	Electrical & communication conduits, cable covers	03/04/2003
TAC26		VINIDEX, Conduit, Heavy Wall for under Road/Rail Crossings, Corflo, Heavy Duty, 7mm Wall Thickness	16/02/1996
*96/p356		Material efficient (corrugated) conduit, Corflo 100 HD. All uses except ULX & URX, these in steel or concrete pipe.	Prior to 01/06/1996

#### Western Cullen Hayes

Ref. No	Categories	Items	Approval Date
TAC 7	Level crossing equipment	Type 3590 Boom mechanism	20/07/1995
*96/p121		Type 3593 Boom mechanism	Prior to 01/06/1996
*05/0202		electronic level crossing bell	12/02/2005

#### Other

Ref. No	Categories	Items	Approval Date
*99/0404	ADAM	RS232/422 converter model 4520	1999
TAC47	AEGIS Pty.	Portable Electronic Cable Locator, model CZ6000 Mk3	13/05/1997
*02/0103	AES	Grid Grid Inverter (GGI) as a ECO	17/12/2001
*04/0902	Amtex	19" Rack mounting 120VAC/48VDC power supply- RM-JWS 600-48	23/09/2004
*04/0502	Black Box	High speed opto- isolator type SP340A-R3 in place of superceded SP400A opto isolator	20/07/2004
*96/p239	Carroll Terminal Co.	Insulated lugs, Double grip, various	Prior to 01/06/1996

*99/1001		Red ring Copper Grip RC1-5 Red wire Pin Copper Grip WPC1 Red Lip Blade Copper Grip LBC1-5 Yellow wire pin Copper Grip WPC5	11/10/1999
TAC 42	CEMBRE (Italy)	Bolt -through Rail Connector type AR60 (M12 bolt)	10/08/1996
TAC 43	Cable Products	Bolt -through Rail Connector type AR67 (M6 bolt)	10/06/1996
TAC 44		Bolt -through Rail Connector type AR65 (M6 bolt)	10/01/1997
*98/0701	Cherokee International	QD5 & QD21 24 volt switch mode power supplies. Type approval applies to a single panel with two units in parallel (2 x QD5 or 2 x QD21) rated at 50A & 90A respectively.	21/07/1998
*96/p367	Dataplex, Netcomm, and Maestro	PSTN modems for general purpose.	Prior to 01/06/1996
*96/p291	DML	DC - AC Immune, Track feed set - spec. BR 867, type TR27	
*96/p373	EDMI	Combiner/Splitter	
*96/p375		Railmaster, and Railmaster compact	
*96/p340	Elettrotecnica Scientifica	Contactors, 100 amp,	Prior to 01/06/1996
*96/p342		Contactors, 150 amp,	
*96/p344		Contactors, 200 amp,	
*01/0501	Expert Tribologies	Dry Switch Plate Lubricant – Graphite based. (Initial Trials carried out in the Hunter Valley)	17/05/2001
*04/0701	Force-12	Single ended with bi-metal link BK 182/127	19/07/2004
*97/0501	Gayrad	SSI Isolating Transformers	12/05/1997
*96/p253	Grafoplast	Clear sleeve & Insert, Grafoplast	Prior to 01/06/1996
*96/p274	Huber & Suehner	Fire-rated twin, Radox	
TAC 14	I.E.I. AUSTRALIA PTY. LTD.	Solar Block Batteries, Dry Fit SB6/200	05/10/1995
*96/0401	IPS	Continuous flexible conduit - type PE80 MDPE, may be installed by ploughing methods	24/04/1996
*96/0902	James Hardie	Polythene Buried Cable Route Cover Strip	16/09/1996
*96/p358	JWA	Combination bell & insulation test set	Prior to 01/06/1996
TAC 0022003	Magnetic Automation	Automatic Pedestrian Gate; hinge plus grease nipples.	20/08/2003
*96/p405		Pedestrian Swing Gates assembly MRG 3B-300 and MRG 3A-300 and ancillary equipment.	Prior to 01/06/1996
*96/p320	Montrose	Signal Heads - Main	
*03/0601	Motpol	LED bayonet lamp for existing boom gate lanterns as interim solution prior to boom upgrade.	05/06/2003
*96/p116	NAIS	Non-vital Cradle Relay, 24V. DC K4EB24V-1 or equivalent.	Prior to 01/06/1996
*96/p117		Non-vital Cradle Relay, 48V. DC K4EB48V-1 or equivalent.	
*03/0501	NKA	Kingfisher Telemetry, surge protection and wiring arrangement.	22/05/2003
*05/0602	nws electronic	CSEE track circuit lug insertion and removal tool	28/06/2005

*96/p350	O'DG	Store 103 50 volt, 2.5 amp	Prior to 01/06/1996
*01/1102	OSD	Fibre Optic Modem Multi Mode (type OSD136)	01/10/2001
*01/1002	Powerbox	Power Supply for Microlok	2001
TAC 15		DC/DC Converter model VTA05S,C12	05/10/1995
*96/p370	Powerware	True Online UPS for SSI interlocking	Prior to 01/06/1996
*96/p395	PRE	Clawlock Drive layout	
*96/p396		Tangential (Assymetric Switch Rail) points layout for WB&S Co M3A Point Machine	
*03/0904		Claw lock mechanism for 1 in 12 to 1 in 18 swing nose V crossings	23/09/2003
*04/0901	Prime Electronics	White LED Panel Indicator Kit for Level Crossing Test Box & combined Test/Emergency Box.	07/09/2004
*96/p123	Releco	Filament changeover relay 1.3-1.5V AC/DC BRB Spec 832	Prior to 01/06/1996
*00/0601	Relectronic Remech of Mascot	Mining type telephones 2.5W and 7W (1043454 & 1042324 respectively) rebuilt	07/06/2000
*03/0701	RS Components	Omni-directional multi-tone generator, for pedestrain crossing. 90mm dia. Voltage 12Vdc.Part 285-2645	17/07/2003
*03/0702		Omni-directional multi-tone generator, for pedestrain crossing. 90mm dia. Voltage 120Vac.Part 626-113	17/07/2003
*96/p385		Contact Suppressor part 210-364	Prior to 01/06/1996
*96/p397	SAFT	Nicad battery for level crossings model SBL135	
<del>*96/p398</del>	<del>Sonnenschein</del>	<del>Dry fit sealed lead acid battery for general float charge applications A400 series.</del>	<del>Prior to 01/06/1996</del>  Superseded by S-05-2714-SN162 (v1.0)
TAC 92/99		<del>Sealed Lead Acid Battery A602V / 250Ah</del>	<del>06/05/1999</del> Superseded by NESA-S039 (v1.0)
*96/p351	Telectran	Store 103 50 volt, 2.5 amp	Prior to 01/06/1996
*96/p338	Telemecanique	Contactors,50 amp,model LC1-D638	
*96/p339		Contactors,100 amp,model CV1-GB	
*96/p341		Contactors,150 amp, model CV1-HB	
*96/p343		Contactors,200 amp, model CV1-JB	
*93/0102	Thermoweld	Exothermic stud weld rail connection process, 6mm and 12mm studs	14/01/1993
*93/0102		Exothermic stud weld rail connection process, 6mm and 12mm studs	14/01/1993
TAC 20		Signal Bond Studs 6mm-16mm Stainless Steel	10/10/1995
*01/1101	Tracktronics	Diversity Link Controller	2001
*03/0201	Transtech	Model PTS-VC-12VDC (0-3 Amp) Trip module	2003
*98/0101		TLPSF10AI surge protection	1998
*96/p369	TRISAN	Switch mode AC to DC power supplies	Prior to 01/06/1996
*96/p129	Walter Rose	Heat-shrink cable jointing kits & materials	