

FIELD ENGINEERING AND TECHNOLOGY**Review of *Aeronautical Engineering* unit standards**

Subfield	Domain	Id
Aeronautical Engineering	Avionic Maintenance	3898-3900, 3943-3954, 4022
	Avionic Repair	3955-4000, 4065, 7245-7247

The Aviation, Tourism and Travel Training Organisation has completed the review of the unit standards listed above that were registered in June 1995, May 1996, and September 1997. Feedback received from industry indicated that a review was necessary.

Date new versions published

May 2006

Planned review date

December 2011

Summary of review and consultation process

The Aviation, Tourism and Travel Training Organisation carried out the review in conjunction with a consultative group. This project has suffered many delays and has been ongoing for some considerable time, having been started in 2003. However, an avionics expert panel, drawn from representatives from Air New Zealand, the Royal New Zealand Air Force and Safe Air Limited, met in Christchurch in December 2004 to determine the skills and knowledge required for the current avionics trade sector; to discuss whether the existing unit standards were still fit for purpose; and to identify any gaps where further unit standards would need to be developed due to the advancement of technology.

Drafts of new and reviewed unit standards were circulated, through the expert panel, to wider industry for feedback. All feedback was considered, and where appropriate, incorporated into the unit standards. Several drafts were developed in order to accommodate the needs of as many stakeholders as possible; the Avionics Review Advisory Group then endorsed these. The review was used to address issues of currency, accuracy, and changes in technology.

Please note that this is the third stage of several to review all of the unit standards in the Aeronautical Engineering subfield.

Main changes resulting from the review

The review process has resulted in the following changes to the unit standards.

- Unit standards 3949, 3959 and 3976 have been designated expiring and will not be replaced due to the equipment being obsolete
- Unit standards 22545 and 22577 are new unit standards developed to cover new industry requirements
- Packaging of skills has been modified in accordance with industry requirements, resulting in the splitting of some unit standards as detailed in the summary of main changes table
- The level of unit standard 7246 has been increased from 3 to 4 to more accurately reflect the level and amount of learning required
- Unit standard 7247 has been moved from the Avionic Repair domain to the Avionic Maintenance domain

- The credit value of unit standards 3978, 3979 and 7246 has been amended to more accurately reflect the content and amount of time taken to assess against the unit standards
- Original credit values were set against unit standards where their development tended to cover very large areas of technology in the vein of the older style of apprentice training. Time has shown that these large and inflexible unit standards were a negative feature for both employers and learners. In a number of cases, time or technology changes (simplification, sealed units, etc), which have reduced the amount of maintenance workshop repair work capability, have shown that they were no longer set appropriately. Hence, when the large unit standards are split the total credit value of the unit standards is not necessarily the same as the original
- Unit standards updated to incorporate industry and technological advances
- Amendments have been made to purpose statements, performance criteria, range statements, and special notes.

Unit standards categorised as category C or D expire at the end of December 2008.

Impact on existing provider accreditations

None.

Impact on Accreditation and Moderation Action Plan (AMAP)

None.

Impact on existing qualifications

None.

Summary of main changes to standards' Ids, classification, titles, levels, and credits

The following summary shows the changes made to the standards as a result of the review. All changes are in **bold**.

Key to review category	
A	Dates changed, but no other changes are made - the new version of the standard carries the same Id and a new version number
B	Changes made, but the overall outcome remains the same - the new version of the standard carries the same Id and a new version number
C	Major changes that necessitate the registration of a replacement standard with a new Id
D	Standard will expire and not be replaced

Subfield Aeronautical Engineering
Domain Avionic Maintenance

Id	Title	Level	Credit	Review Category
3898	Demonstrate knowledge of aircraft instrument systems	3	10	B
3899	Demonstrate knowledge of aircraft radio communications and navigation systems	3	10	B
3900	Demonstrate knowledge of aircraft electrical systems	3	10	B
3943	Maintain aircraft galley equipment	4	6	B

Id	Title	Level	Credit	Review Category
3944	Maintain aircraft gaseous oxygen systems	4	12	B
3945	Maintain aircraft autopilot systems	4	25	B
3946	Maintain aircraft communication systems	4	60	C
22509	Maintain aircraft high frequency (HF) communications systems	4	5	
22510	Maintain aircraft very high frequency (VHF) communications systems	4	5	
22511	Maintain aircraft intercommunications systems	4	5	
22512	Maintain aircraft public address systems	4	5	
22513	Maintain aircraft emergency locator beacon systems	4	5	
22514	Maintain aircraft in-flight entertainment systems	4	5	
3947	Maintain aircraft electrical systems	4	50	
22515	Maintain aircraft direct current generating systems	4	5	
22516	Maintain aircraft alternating current generating systems	4	6	
22517	Maintain aircraft electrical motors and actuators	4	7	
22518	Maintain aircraft batteries and charging systems	4	4	
22519	Maintain aircraft power distribution systems	4	7	
22520	Maintain aircraft lighting systems	4	3	
22521	Maintain aircraft fire protection and detection systems	4	4	
22522	Maintain aircraft ignition systems	4	2	
22523	Maintain aircraft temperature datum systems	4	2	
3948	Maintain aircraft global positioning satellite navigation systems	4	8	B
3949	Maintain aircraft hyperbolic navigation systems	4	12	D
3950	Maintain aircraft independent navigation systems	4	64	C
22524	Maintain aircraft inertial navigation systems	4	5	
22525	Maintain aircraft weather radar systems	4	4	
22526	Maintain aircraft radio and/or radar altimeter systems	4	4	
22527	Maintain aircraft ground proximity warning systems	4	5	
22528	Maintain aircraft traffic alert and collision avoidance systems	4	5	

Id	Title	Level	Credit	Review Category
3951	Maintain aircraft instrument systems	4	45	C
22529	Maintain aircraft monitoring instrument systems	4	5	
22530	Maintain aircraft electrical system indicators and clocks	4	2	
22531	Maintain aircraft flight data recording and/or cockpit voice recording systems	4	2	
22532	Maintain aircraft pitot static systems	4	7	
22533	Maintain aircraft gyroscopic instrument systems	4	2	
22534	Maintain aircraft position indication systems	4	5	
3952	Maintain aircraft liquid oxygen systems	4	25	C
22928	Maintain aircraft liquid oxygen systems	4	10	
3953	Maintain aircraft optical systems	4	35	C
22535	Maintain aircraft infrared imaging and/or detection systems	4	3	
22536	Maintain aircraft night vision systems	4	2	
22537	Maintain aircraft head-up display systems	4	2	
22538	Maintain aircraft fibre optic cabling	4	2	
3954	Maintain aircraft short range navigation systems	4	60	C
22539	Maintain aircraft Tactical Air Navigation systems	4	5	
22540	Maintain aircraft landing approach aid systems	4	8	
22541	Maintain aircraft distance measuring equipment systems	4	4	
22542	Maintain aircraft Automatic Direction Finding systems	4	4	
22543	Maintain aircraft transponder and/or Identification Friend or Foe systems	4	5	
22544	Maintain aircraft microwave systems	4	3	
4022	Maintain aircraft compass systems	4	15	B
22545	Maintain aircraft wiring loom and harness assemblies	4	33	New

Domain Avionic Repair

Id	Title	Level	Credit	Review Category
3955	Repair and/or fabricate aircraft wiring loom and harness assemblies	4	12	B
3956	Repair and/or overhaul optical system components Repair commercial aviation optical system components	4	38	B
3957	Repair aircraft audio system components	4	30	C
22929	Repair aircraft audio system components	4	20	
3958	Repair aircraft LORAN navigation system components	4	43	C
22930	Repair aircraft LORAN navigation system components	4	25	

Id	Title	Level	Credit	Review Category
3959	Repair aircraft OMEGA navigation system components	4	25	D
3960	Repair aircraft passenger address and entertainment system components	4	50	C
22546	Repair aircraft passenger address system components	4	10	
22547	Repair aircraft passenger entertainment system components	4	10	
3961	Repair radio frequency communication system components	4	60	C
22548	Repair aircraft high frequency (HF) communication system components	4	20	
22549	Repair aircraft very high frequency (VHF) communication system components	4	20	
22550	Repair aircraft ultra high frequency (UHF) communication system components	4	20	
3962	Repair aircraft audiovisual tape reproduction equipment	4	28	C
22551	Repair aircraft video tape players	4	10	
22552	Repair aircraft in-flight entertainment video display units	4	15	
3963	Repair aircraft galley equipment	4	25	C
22553	Repair aircraft galley heating equipment	4	10	
22554	Repair aircraft galley chilling equipment	4	15	
3964	Repair aircraft navigation computing system components	4	20	B
3965	Repair aircraft electrical anti-icing and deicing system components	4	15	B
	Repair aircraft electrical anti-icing and de-icing system components			
3966	Repair aircraft automatic electronic braking system components	4	10	B
3967	Repair and/or recondition aircraft auto pilot system components	4	30	B
	Repair and/or recondition aircraft autopilot system components			
3968	Repair aircraft batteries	3	10	C
22555	Repair aircraft lead-acid batteries	4	5	
22556	Repair aircraft nickel-cadmium batteries	4	5	
3969	Repair aircraft electronic engine control system components	4	45	C
22931	Repair aircraft electronic engine control system components	4	25	
3970	Repair aircraft compass system components	4	30	C
22932	Repair aircraft compass system components	4	20	
3971	Repair aircraft computer system components	4	45	C
22557	Repair aircraft digital computer equipment	4	40	
22558	Repair aircraft digital computer peripheral equipment	4	25	

Id	Title	Level	Credit	Review Category
3972 22559 22560 22561	Repair and/or recondition air data instrument system components Repair electromechanical air data instruments Repair mechanical air data instruments Repair aircraft pressure sensing digital air data computers	4 4 4 4	86 30 30 25	C
3973 22933	Repair aircraft flight data recording equipment Repair aircraft flight data recording equipment	4 4	66 10	C
3974 22562 22563 22564	Repair aircraft electronic instrument displays Repair aircraft electronic instrument displays Repair aircraft electronic multifunction displays Repair aircraft electronic character and/or symbol generators	4 4 4 4	78 25 25 25	C
3975 22565 22566 22567 22568	Repair aircraft electrical power supply and distribution system components Repair aircraft electronic power control and distribution system components Repair aircraft solid state invertors Repair aircraft transformer rectifier units Repair aircraft electromechanical regulators	4 4 4 4 4	50 20 15 5 10	C
3976	Repair aircraft Doppler navigation system components	4	78	D
3977 22934	Repair aircraft electrical and electronic switching equipment Repair aircraft electrical and electronic switching equipment	4 4	20 10	C
3978	Repair aircraft fire detection and protection system components	4	20 15	B
3979	Repair global positioning satellite navigation system components Repair aircraft global positioning system components	4	40 30	B
3980 22935	Repair and/or recondition aircraft gyroscopic instrument system components Repair and/or recondition aircraft gyroscopic instrument system components	4 4	70 50	C
3981	Repair aircraft inertial navigation system components	4	40	B
3982	Repair aircraft lighting system components	4	30	B
3983	Repair aircraft optical system components	4	40	B
3984	Repair aircraft pitot static system components	4	10	B
3985 22569 22570	Repair and/or recondition aircraft primary airborne radar system components Repair aircraft primary airborne radar transceivers Repair aircraft primary radar antenna drive units and control panels	4 4 4	85 55 25	C

Id	Title	Level	Credit	Review Category
3986	Repair aircraft ground proximity warning system components	4	58	C
22936	Repair aircraft ground proximity warning system components	4	20	
3987	Repair aircraft reciprocating engine ignition system components	4	30	C
22937	Repair aircraft reciprocating engine ignition system components	4	10	
3988	Repair aircraft radio and radar altimeter system components	4	60	C
22938	Repair aircraft radio and radar altimeter system components	4	30	
3989	Repair aircraft radar navigation system components	4	70	C
22571	Repair aircraft distance measuring equipment	4	35	
22572	Repair aircraft tactical air navigation system components	4	35	
22573	Repair aircraft transponder system components	4	35	
3990	Repair aircraft radio navigation system components	4	70	C
22574	Repair aircraft very high frequency (VHF) omnidirectional range system components	4	30	
22575	Repair aircraft instrument landing system components	4	30	
22576	Repair aircraft automatic direction finder system components	4	20	
3991	Repair aircraft direct reading instrument system components	4	50	C
22939	Repair aircraft direct reading instrument system components	4	20	
3992	Repair aircraft remote reading flight instruments and components	4	70	C
22968	Repair aircraft remote reading flight instruments and components	4	50	
3993	Repair aircraft remote reading quantitative instruments and components	4	70	C
22940	Repair aircraft remote reading quantitative instruments and components	4	45	
3994	Repair aeronautical electronic test equipment	4	40	B
3995	Repair aircraft gas turbine engine ignition system components	4	35	C
22941	Repair aircraft gas turbine engine ignition system components	4	20	
3996	Repair aircraft cockpit voice recorders and area microphones	4	30	B

Id	Title	Level	Credit	Review Category
3997	Repair aircraft electric cabin heating system components	4	25	C
22942	Repair aircraft electric cabin heating system components	4	15	
3998	Repair aircraft weapons radar system components	4	20	B
3999	Repair avionic printed circuit boards	4	9	B
4000	Repair and/or recondition aircraft electrical rotating machines	4	52	C
22943	Repair and/or recondition aircraft electrical rotating machines	4	30	
4065	Fabricate aeronautical printed circuit boards by etching	4	6	B
7245	Demonstrate knowledge of avionic electronic theory	3	20	B
7246	Apply avionic repair skills	3 4	15 18	B
7247 *	Apply avionic maintenance practices	3	23	B
22577	Repair and/or fabricate aircraft fibre optic conductors and harness assemblies	4	12	New

*** Note: The classification for unit standard 7247 has changed from the Avionic Repair domain to the Avionic Maintenance domain.**

Transition Arrangements

The Avionics Review Advisory Group have agreed to the following process:

- 1 All new avionic trainees signing an Aeronautical training agreement as at (date new units published) will be assessed against the new unit standards.
- 2 All existing avionic trainees currently working through their training agreement have the option of switching to the new avionic unit standards or continue current training agreement until completion:
 - a If trainee and company agree to switch and replace unit standards a new training agreement is created with the agreed new unit standards
 - b The new training agreement is forwarded to ATTTO.