Australian Government

MSA07 Manufacturing Training Package

Release: 8.2

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CONTENTS

Modification History

Version	Release Date	Comments
8.2	5 April 2013	**ISC Upgrades** • Seven (7) competitive manufacturing qualifications not carried forward - superseded by new qualifications endorsed 20 April 2012 in MSS11v2 • Competitive manufacturing units of competency not carried forward - superseded by new units endorsed in MSS11v2 • New release of fifteen (15) qualifications - imported elective units updated to current versions (including prerequisites) • Editorial changes to six (6) units of competency • Editorial changes to two (2) licensing Skill Sets • Unit grid updated for one (1) Skill Set Refer to mapping for details.
8.1	15 October 2012	**ISC upgrade** Editorial changes to boiler units of competency to clarify WHS Regulations.
8	15 May 2012	**Endorsed changes** Addition of two new units: • MSABLIC001 License to operate a standard boiler • MSABLIC002 License to operate and advanced boiler **ISC upgrades** • Inclusion of two boiler licensing Skill Sets • Inclusion of 59 units imported from MSS11v2 • Competitive Manufacturing qualifications superseded by new Competitive Systems and Practices (endorsed in MSS11v2). • Competitive Manufacturing units of competency in other MSA qualifications

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		replaced by Competitive Systems and Practices units imported from MSS11v2. Refer to mapping for more details.
7	15 November 2011	Addition of two new qualifications: • MSA40311 Certificate IV in Process Manufacturing • MSA50311 Diploma of Production Management Inclusion of 51 additional imported units. (Refer to mapping for details.) ISC upgrades include: • Addition of a Leading Hand/Supervisor Skill Set • Updating of imported units • Minor editorial changes • Imported units updated in relevant qualifications.
6	April 2011	**Endorsed changes** Addition of eight new qualifications and six new units of competency for recreational vehicle manufacture, retailing, service and repair. Inclusion of an additional 82 imported units as electives for recreational vehicle qualifications. Two new units of competency for water jetting included as electives in MSA30309. One new unit of competency to replace a deleted imported unit. **ISC upgrades** 11 qualifications adjusted for flexibility/sustainability requirements (refer to

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		mapping for details) Minor edits to 5 MSAPM units (MSAPMOHS100A, OHS200A, OPS101A, OPS363A and SUP106A) Imported units updated and minor typographical errors corrected in mapping. ***Refer to Summary Mapping for details of changes to qualifications and units.***
5.1	July 2010	**ISC Updates**: Eight qualifications adjusted to comply with flexibility rules: MSA10107, MSA10207, MSA20107, MSA21108, MSA30107, MSA30309, MSA31108, MSA41108. Confined Space Entry units updated to comply with revised Australian Standard AS2685-2009: MSAPMPER200C, MSAPMPER205C and MSAPMPER300C. Sustainability units (MSAENV272B, MSAENV472B and MSAENV672B) updated to clarify terminology and to expand Range of Variables to better incorporate environmental sustainability. PML04 units of competency updated to MSL09 units in MSA30208, MSA40108, MSA50108 and MSA60108.
5	November 2009	• One new qualification - MSA30309 Certificate III in Surface Preparation and Coating Application.

Version	Release Date	Comments
		• Three new units of competency and an additional 35 imported units for inclusion in MSA07 aligned to the new certificate. • Fourteen (14) new units of competency and five Skill Sets for Trade Measurement (not aligned to any qualifications). **Refer to History for details.** In addition, minor corrections have been made to the Overview of Assessment Requirements in the Evidence Guide for two sustainability units (MSAENV272A and MSAENV472A).
4	27 July 2009	MSA07v4 includes two new qualifications: MSA71109 Vocational Graduate Certificate in Competitive Manufacturing MSA81109 Vocational Graduate Diploma of Competitive Manufacturing. It also includes 21 new units of competency.
3.1	12 March 2009	Version 3.1 includes six new units and the importation of an additional 10 MEM units for a new structural steel detailing stream in the following existing qualifications: • MSA30208 Certificate III in Manufacturing Technology • MSA50108 Diploma of Manufacturing Technology. Miscellaneous typographical errors have been corrected. Refer to Modification History for details.
3	27 August 2008	MCM04 qualifications and units of competency recoded and placed in MSA07. Key Competencies replaced in Competitive Manufacturing units with Employability Skills.

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		Two new specialist streams for metallurgy and polymer technology have been added to the existing Technology Cadetship qualifications, now coded MSA30208 and MSA40108.
		Two new Technology Cadetship qualifications – MSA50108 and MSA60108.
		Category 1 changes to following MSAPM units resulting from review of PMA08: MSAPMPER200B, MSAPMPER205B, MSAPMPER300B and MSAPMOHS210B.
		Two additional MSAPM units: MSAPMPER202A and MSAPMPER400A
		Deletion of MSAPM302A
		Category 1 changes to MSA10107, MSA10207, MSA20107 and MSA30107 as a result of recoding of MCM units and changes to MSAPM units.
		Additional Category 1 changes to MSA10107 to include updated versions of LMT and LMF units.
2	16 November 2007	Addition of three production support certificates and other generic units for use across the three process manufacturing Training Packages (PMA, PMB and PMC). This included the three new sustainability units.
		Units of competency in MSA10107 Certificate I in Manufacturing (Pathways) updated with units from PMB07 (details below).
1	April 2007	Initial release

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Preliminary Information

Important Note to Users

Training Packages are not static documents; they are amended periodically to reflect the latest industry practices and are version controlled. It is essential that the latest version is always used.

Check the version number before commencing training or assessment

This Training Package is Version 8.2 - check whether this is the latest version by going to the training.gov.au website and locating information about the Training Package. Alternatively, contact Manufacturing Industry Skills Council at http://www.mskills.com.au to confirm the latest version number.

Explanation of version number conventions

The primary release Training Package is Version 1. When changes are made to a Training Package, sometimes the version number is changed and sometimes it is not, depending on the extent of the change. When a Training Package is reviewed it is considered to be a new Training Package for the purposes of version control, and is Version 1. Do not confuse the version number with the Training Packages national code (which remains the same during its period of endorsement).

Explanation of the review date

The review date shown on the title page indicates when the Training Package is expected to be reviewed in the light of changes, such as changing technologies and circumstances. The review date is not an expiry date. Training Packages and their components remain current until they are reviewed or replaced.

Training Package Details

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Training Package Name:	Manufacturing
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Training Package Code: MSA07

ISC Name: Manufacturing Skills Australia

ISC Website URL: www.mskills.com.au

MSA07v8.2 List of AQF Qualifications

Qualification Code	Title
MSA10107	Certificate I in Manufacturing (Pathways)
MSA10207	Certificate I in Process Manufacturing
MSA20107	Certificate II in Process Manufacturing
MSA20208	Certificate II in Manufacturing Technology
MSA20510	Certificate II in Recreational Vehicle Service and Repair
MSA20610	Certificate II in Recreational Vehicle Manufacture
MSA30107	Certificate III in Process Manufacturing
MSA30208	Certificate III in Manufacturing Technology
MSA30309	Certificate III in Surface Preparation and Coating Application
MSA30510	Certificate III in Recreational Vehicle Service and Repair
MSA30610	Certificate III in Recreational Vehicle Manufacture
MSA30710	Certificate III in Recreational Vehicle and Accessories Retailing
MSA40108	Certificate IV in Manufacturing Technology
MSA40311	Certificate IV in Process Manufacturing
MSA40510	Certificate IV in Recreational Vehicles
MSA40710	Certificate IV in Recreational Vehicle and Accessories Retailing
MSA50108	Diploma of Manufacturing Technology
MSA50311	Diploma of Production Management

Qualification Code	Title
MSA50510	Diploma of Recreational Vehicles
MSA60108	Advanced Diploma of Manufacturing Technology

Competitive manufacturing qualifications superseded by MSS11 qualifications

MSA07 Code	MSA07 Title	MSS11v2 Code	MSS11v2 Title
MSA21108	Certificate II in Competitive Manufacturing	MSS20312	Certificate II in Competitive Systems and Practices
MSA31108	Certificate III in Competitive Manufacturing	MSS30312	Certificate III in Competitive Systems and Practices
MSA41108	Certificate IV in Competitive Manufacturing	MSS40312	Certificate IV in Competitive Systems and Practices
MSA51108	Diploma of Competitive Manufacturing	MSS50312	Diploma of Competitive Systems and Practices
MSA61108	Advanced Diploma of Competitive Manufacturing	MSS60312	Advanced Diploma of Competitive Systems and Practices
MSA71109	Vocational Graduate Certificate in Competitive Manufacturing	MSS70312	Vocational Graduate Certificate in Competitive Systems and Practices
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	MSS80312	Vocational Graduate Diploma of Competitive Systems and Practices

MSA07v8.2 Units of competency and their prerequisites

Code	Title	Prerequisite
MSABLIC001	Licence to operate a standard boiler	None
MSABLIC002	Licence to operate an advanced boiler	None
MSAENV272B	Participate in environmentally sustainable work practices	None
MSAENV472B	Implement and monitor environmentally sustainable work practices	None
MSAENV672B	Develop workplace policy and procedures for environmental sustainability	None
MSAPCI101A	Adapt to work requirements in industry	None
MSAPCI102A	Apply effective work practices	None
MSAPCI103A	Demonstrate care and apply safe practices at work	None
MSAPCII295A	Operate manufacturing equipment	None
MSAPCII296A	Make a small furniture item from timber	None
MSAPCII297A	Make an object from cloth using an existing pattern	None
MSAPCII298A	Make an object from metal	None
MSAPCII299A	Make an object from plastic	None
MSAPMOHS100A	Follow OHS procedures	None
MSAPMOHS110A	Follow emergency response procedures	None
MSAPMOHS200A	Work safely	None
MSAPMOHS205A	Control minor incidents	None
MSAPMOHS210B	Undertake first response to non-fire incidents	None
MSAPMOHS212A	Undertake first response to fire incidents	None
MSAPMOHS216A	Operate breathing apparatus	None

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MSAPMOHS217A	Gas test atmospheres	None
MSAPMOHS220A	Provide initial first aid response	None
MSAPMOHS300A	Facilitate the implementation of OHS for a work group	MSAPMOHS200A
MSAPMOHS400A	Contribute to OHS management system	MSAPMOHS300A
MSAPMOHS401A	Assess risk	None
MSAPMOHS503A	Maintain the workplace OHS management system	None
MSAPMOHS510A	Manage risk	MSAPMOHS401A
MSAPMOHS601A	Establish workplace OHS management system	MSAPMOHS503A
MSAPMOPS100A	Use equipment	None
MSAPMOPS101A	Make measurements	None
MSAPMOPS102A	Perform tasks to support production	None
MSAPMOPS200A	Operate equipment	None
MSAPMOPS201A	Cut polymer materials	None
MSAPMOPS202A	Fabricate polymer materials	None
MSAPMOPS212A	Use enterprise computers or data systems	None
MSAPMOPS244A	Layout and cut materials	None
MSAPMOPS301A	Treat corrosion	None
MSAPMOPS363A	Organise on site work	None
MSAPMOPS400A	Optimise process/plant area	MSAPMSUP390A
MSAPMOPS401A	Trial new process or product	None
MSAPMOPS404A	Co-ordinate maintenance	None
MSAPMOPS405A	Identify problems in fluid power system	None
MSAPMOPS406A	Identify problems in electronic control	None

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	systems	
MSAPMOPS601A	Design equipment and systems modifications	None
MSAPMPER200C	Work in accordance with an issued permit	None
MSAPMPER201A	Monitor and control work permits	None
MSAPMPER202A	Observe permit work	None
MSAPMPER205C	Enter confined space	MSAPMPER200C
MSAPMPER300C	Issue work permits	RIIRIS201A
MSAPMPER400A	Coordinate permit process	MSAPMPER300C
MSAPMSUP100A	Apply workplace procedures	None
MSAPMSUP101A	Clean workplace or equipment	None
MSAPMSUP102A	Communicate in the workplace	None
MSAPMSUP106A	Work in a team	None
MSAPMSUP172A	Identify and minimise environmental hazards	None
MSAPMSUP200A	Achieve work outcomes	None
MSAPMSUP201A	Receive or despatch goods	None
MSAPMSUP204A	Pack products or materials	None
MSAPMSUP205A	Transfer loads	None
MSAPMSUP210A	Process and record information	None
MSAPMSUP230A	Monitor process operations	None
MSAPMSUP240A	Undertake minor maintenance	None
MSAPMSUP273A	Handle goods	None
MSAPMSUP280A	Manage conflict at work	None
MSAPMSUP291A	Participate in continuous improvement	None
MSAPMSUP292A	Sample and test materials and product	None
MSAPMSUP300A	Identify and implement opportunities to	MSAPMSUP200A

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	maximise production efficiencies	
MSAPMSUP301A	Apply HACCP to the workplace	None
MSAPMSUP303A	Identify equipment faults	None
MSAPMSUP309A	Maintain and organise workplace records	None
MSAPMSUP310A	Contribute to development of plant documentation	None
MSAPMSUP330A	Develop and adjust a production schedule	None
MSAPMSUP382A	Provide coaching/mentoring in the workplace	None
MSAPMSUP383A	Facilitate a team	None
MSAPMSUP390A	Use structured problem solving tools	None
MSAPMSUP400A	Develop and monitor quality systems	None
MSAPMWJ201A	Use high pressure water jetting equipment	None
MSAPMWJ301A	Operate a high pressure water jetting system	None
MSARVG201A	Tow a recreational vehicle safely	None
MSARVS201A	Install LP gas systems in a recreational vehicle	None
MSARVS202A	Repair/service LP gas systems in a recreational vehicle	None
MSARVS301A	Develop and update caravan industry knowledge	None
MSARVS401A	Assess and quote to service a recreational vehicle	None
MSARVT201A	Apply technical knowledge of recreational vehicle manufacturing to work activities	None
MSATCM301A	Test the mechanical properties of materials	None
MSATCM302A	Monitor basic ferrous melting and casting processes	None
MSATCM303A	Monitor basic non-ferrous melting and casting processes	None

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MSATCM304A	Interpret basic binary phase diagrams	None
MSATCM305A	Demonstrate basic knowledge of casting operations	None
MSATCM401A	Prepare and examine metallographic samples	MSATCM304A
MSATCM402A	Monitor and test sands, cores and moulds	None
MSATCM403A	Evaluate mould design and gating	(MSATCM304A MSATCM305A)
MSATCM404A	Undertake and interpret results of chemical analysis on metal samples	None
MSATCM405A	Determine and supervise heat treatment of metal	(MEM06003C MSATCM304A)
MSATCM406A	Apply basic chemistry principles to metallurgy	None
MSATCM501A	Calculate and predict chemical outcomes in metallurgical situations	MSATCM406A
MSATCM502A	Identify and describe equipment for mineral and chemical processing plants	(MSATCM304A MSATCM406A)
MSATCM503A	Recommend a refractory for an application	None
MSATCM504A	Select metal forming process	(MEM30007A MEM09002B MSATCM501A)
MSATCM505A	Select metal joining process	(MEM30007A MEM09002B MSATCM406A)
MSATCM506A	Monitor blast furnace operations	(MSATCM304A MSATCM406A MSATCM501A)
MSATCM507A	Monitor primary steel making process	(MSATCM304A MSATCM406A MSATCM501A)
MSATCM508A	Monitor secondary steelmaking operations	(MSATCM301A MSATCM304A MSATCM503A)

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MSATCM509A	Recommend ferrous and non ferrous metals or alloys for an application	MSATCM304A
MSATCM510A	Apply metallurgical principles and techniques in welding and other thermal processes	MSATCM505A
MSATCM511A	Apply metallurgy principles and practice to determine metal forming and shaping processes	None
MSATCM512A	Apply metallurgy principles and practice to optimise furnace operation	None
MSATCM513A	Plan and complete metallurgical projects	(MEM16008A MEM30012A MEM23061A MEM23071A MSATCM405A MSATCM509A MSATCM510A)
MSATCM514A	Select surface treatment methods for metallic components or products	None
MSATCM515A	Analyse metallurgical failures of components and recommend preventative measures	(MSATCM401A MSATCM406A)
MSATCM516A	Select non metallic materials for engineering applications manufacturing, engineering and structural	None
MSATCM517A	Determine corrosion prevention strategies for metal and alloys	None
MSATCM518A	Interpret complex binary phase diagrams	MSATCM304A
MSATCS301A	Interpret architectural and engineering design specifications for structural steel detailing	MEM09002B
MSATCS302A	Detail bolts and welds for structural steelwork connections	(MEM05051A MEM09002B MSATCS301A)
MSATCS501A	Detail standardised structural connections	(MEM05051A MEM09002B MSATCS301A)

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MSATCS502A	Detail structural steel members	(MEM09002B MSATCS301A)
MSATCS503A	Incorporate structural steel detailing into fabrication and construction project management	None
MSATCS504A	Detail ancillary steelwork	(MEM09002B MSATCS301A)
MSATMINS301A	Inspect a range of simple measures	None
MSATMINS302A	Inspect a range of simple measuring instruments	None
MSATMINS401A	Inspect a range of weighing instruments	None
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures	None
MSATMINS403A	Inspect a range of trading practices	None
MSATMINS404A	Inspect a range of pre-packaged products	None
MSATMINS501A	Inspect a range of complex measuring instruments	None
MSATMREF301A	Use and maintain reference standards	None
MSATMVER301A	Verify simple measures	None
MSATMVER302A	Verify a simple measuring instruments	None
MSATMVER401A	Verify a limited weighing instrument	None
MSATMVER402A	Verify a liquid measuring instrument using volume measures	None
MSATMVER403A	Verify inspector's class reference standards	None
MSATMVER501A	Verify a complex measuring instrument	None

MSA07v8.2 Imported units of competency

Code	**Title**	**Origin**

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AUM4003A	Interpret customer requirements	AUM12
AUMANA3001	Prepare and document quotation	AUM12
AUMFTA3001	Document designs	AUM12
AUMGTT2001	Apply trim to components	AUM12
AURAAA4002	Determine retail rates for work	AUR12
AURACA2001	Establish relations with customers	AUR12
AURACA3002	Establish customer requirements of a complex nature	AUR12
AURACA3003	Build customer relations	AUR12
AURAFA2004	Solve routine problems in an automotive workplace	AUR12
AURAFA5007	Develop and document specifications and procedures	AUR12
AURAKA3002	Adapt work processes to new technologies	AUR12
AURALA3001	Determine legal aspects of an automotive service and repair contract	AUR12
AURAMA3004	Maintain business image	AUR12
AURAMA4005	Manage complex customer issues	AUR12
AURAMA5006	Contribute to business improvement	AUR12
AURANN4001	Prepare a vehicle repair quotation	AUR12
AURATA3005	Estimate complex jobs	AUR12
AURC341903A	Apply relevant finance, leasing and insurance contracts/policies	AUR12
AURETB3001	Repair electric braking systems	AUR12
AURETR2010	Fabricate, test and repair wiring harnesses and looms	AUR12
AURETR2012	Test and repair basic electrical circuits	AUR12
AURETR2015	Inspect and service batteries	AUR12
AURSCA2001	Select automotive parts and products	AUR12
AURSAA2001	Process customer complaints	AUR12

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AURSBA3002	Apply automotive parts interpretation process	AUR12
AURSCA2002	Present stock and sales area	AUR12
AURSCA2003	Apply sales procedures	AUR12
AURSCA2004	Carry out cash, credit and funds transfers	AUR12
AURSCA2005	Sell products	AUR12
AURSCA2006	Promote products and services	AUR12
AURSLA2001	Apply legal requirements relating to product sales	AUR12
AURTNA5001	Estimate and calculate costs to repair, maintain or modify a vehicle	AUR12
AURTTA3017	Carry out vehicle safety and roadworthy inspection	AUR12
AURTTB2001	Inspect and service braking systems	AUR12
AURTTD2004	Inspect and service suspension systems	AUR12
AURTTJ2002	Remove and refit wheel hubs and associated brake components	AUR12
AURTTY3001	Repair chassis, frame and associated components	AUR12
AURV365356A	Read and interpret vehicle body repair estimation/quotation	AUR12
AURVTN2005	Remove and fit protector mouldings, transfers and decals	AUR12
AURVTN4032	Determine vehicle damage and recommended repair procedures	AUR12
AURVTP2007	Apply paint touch-up techniques	AUR12
AURVTS3004	Repair fibreglass and composite material components	AUR12
AURVTT3015	Fabricate canvas products	AUR12
AURVTT3016	Fabricate frame structures	AUR12
AURVTT3019	Fabricate and install canopies and curtains	AUR12
AURVTG3011	Install side windows	AUR12
BSBCUS501C	Manage quality customer service	BSB07

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BSBFIM501A	Manage budgets and financial plans	BSB07
BSBINM501A	Manage an information or knowledge management system	BSB07
BSBMGT403A	Implement continuous improvement	BSB07
BSBMGT502B	Manage people performance	BSB07
BSBWRK510A	Manage employee relations	BSB07
FDFOP2005A	Work in a socially diverse environment	FDF10
FNSORG501A	Develop and manage a budget	FNS10
FPICOT2206B	Cross cut materials with a hand-held chainsaw	FPI05
LMFFM1002B	Operate basic woodworking machines	LMF02
LMFFM2001B	Use furniture making sector hand and power tools	LMF02
LMFFM2002B	Assemble furnishing components	LMF02
LMFFM2003B	Select and apply hardware	LMF02
LMFFM2005B	Join solid timber	LMF02
LMFSF1001B	Produce basic soft furnishing accessories	LMF02
LMFSF2001B	Cut single layer fabrics	LMF02
LMTCL2001B	Use a sewing machine	LMT07
LMTCL2003B	Identify fibres and fabrics	LMT07
LMTCL2006B	Press work	LMT07
LMTCL2007B	Lay up, mark and cut uncomplicated fabrics and lays	LMT07
LMTCL2008B	Finish garment production	LMT07
LMTGN2008B	Coordinate work of team or section	LMT07
LMTGN4002A	Participate in product engineering	LMT07
LMTGN4016A	Contribute to the development of products or processes	LMT07
LMTGN5004A	Manage installation and commissioning of equipment and systems	LMT07

MEM03001B	Perform manual production assembly	MEM05
MEM03003B	Perform sheet and plate assembly	MEM05
MEM03004B	Perform electronic/electrical assembly (production)	MEM05
MEM03006B	Set assembly stations	MEM05
MEM05005B	Carry out mechanical cutting	MEM05
MEM05007C	Perform manual heating and thermal cutting	MEM05
MEM05012C	Perform routine manual metal arc welding	MEM05
MEM05050B	Perform routine gas metal arc welding	MEM05
MEM05051A	Select welding processes	MEM05
MEM05052A	Apply safe welding practices	MEM05
MEM06003C	Carry out heat treatment	MEM05
MEM07001B	Perform operational maintenance of machines/equipment	MEM05
MEM07015B	Set computer controlled machines/processes	MEM05
MEM07024B	Operate and monitor machine/process	MEM05
MEM07028B	Operate computer controlled machines/processes	MEM05
MEM08002C	Pre-treat work for subsequent surface coating	MEM05
MEM08007B	Control surface finish production and finished product quality	MEM05
MEM08011B	Prepare surfaces using solvents and/or mechanical means	MEM05
MEM08012B	Prepare surfaces by abrasive blasting (basic)	MEM05
MEM08013B	Prepare surfaces by abrasive blasting (advanced)	MEM05
MEM08014B	Apply protective coatings (basic)	MEM05
MEM08015B	Apply protective coatings (advanced)	MEM05
MEM08016B	Control blast coating by-products, materials and emissions	MEM05
MEM09002B	Interpret technical drawing	MEM05

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MEM09005B	Perform basic engineering detail drafting	MEM05
MEM09006B	Perform advanced engineering detail drafting	MEM05
MEM09009C	Create 2D drawings using computer aided design system	MEM05
MEM09011B	Apply basic engineering design concepts	MEM05
MEM09157A	Perform mechanical engineering design drafting	MEM05
MEM09158A	Perform mechatronics engineering design drafting	MEM05
MEM09155A	Prepare mechanical models for computer-aided engineering (CAE)	MEM05
MEM09155A	Prepare mechatronic models for computer-aided engineering (CAE)	MEM05
MEM09204A	Produce basic engineering detail drawings	MEM05
MEM09205A	Produce electrical schematic drawings	MEM05
MEM09210A	Create 3-D solid models using computer-aided design (CAE) system	MEM05
MEM09216A	Interpret and produce curved 3-D shapes and patterns	MEM05
MEM10002B	Terminate and connect electrical wiring	MEM05
MEM11001C	Erect/dismantle scaffolding and equipment	MEM05
MEM11002C	Erect/dismantle complex scaffolding and equipment	MEM05
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment	MEM05
MEM11004B	Undertake dogging	MEM05
MEM11005B	Pick and process order	MEM05
MEM11006B	Perform production packaging	MEM05
MEM11007B	Administer inventory procedures	MEM05
MEM11010B	Operate mobile load shifting equipment	MEM05
MEM11011B	Undertake manual handling	MEM05
MEM11012B	Purchase materials	MEM05

MEM11016B	Order materials	MEM05
MEM11017B	Organise and lead stocktakes	MEM05
MEM11021B	Perform advanced operation of load shifting equipment	MEM05
MEM11022B	Operate fixed/moveable load shifting equipment	MEM05
MEM12001B	Use comparison and basic measuring devices	MEM05
MEM12002B	Perform electrical/electronic measurement	MEM05
MEM12003B	Perform precision mechanical measurement	MEM05
MEM12005B	Calibrate measuring equipment	MEM05
MEM12006C	Mark off/out (general engineering)	MEM05
MEM12022B	Program coordinate measuring machines (advanced)	MEM05
MEM12023A	Perform engineering measurements	MEM05
MEM12024A	Perform computations	MEM05
MEM12025A	Use graphical techniques and perform simple statistical computations	MEM05
MEM13001B	Perform emergency first aid	MEM05
MEM13002B	Undertake occupational health and safety activities in the workplace	MEM05
MEM13003B	Work safely with industrial chemicals and materials	MEM05
MEM13004B	Work safely with molten metals/glass	MEM05
MEM13010A	Supervise occupational health and safety in an industrial work environment.	MEM05
MEM13013B	Work safely with ionizing radiation	MEM05
MEM13014A	Apply principles of occupational health and safety in the work environment	MEM05
MEM14001B	Schedule material deliveries	MEM05
MEM14002B	Undertake basic process planning	MEM05
MEM14003B	Undertake basic production scheduling	MEM05

MEM14004A	Plan to undertake a routine task	MEM05
MEM14005A	Plan a complete activity	MEM05
MEM14085A	Apply mechanical engineering analysis techniques	MEM05
MEM14086A	Apply mechatronic engineering analysis techniques	MEM05
MEM14087A	Apply manufactured product design techniques	MEM05
MEM14088A	Apply maintenance engineering techniques to equipment and component repairs and modifications	MEM05
MEM14089A	Integrate mechanical fundamentals into an engineering task	MEM05
MEM14090A	Integrate mechatronic fundamentals into an engineering task	MEM05
MEM14091A	Integrate manufacturing fundamentals into an engineering task	MEM05
MEM14092A	Integrate maintenance fundamentals into an engineering task	MEM05
MEM15001B	Perform basic statistical quality control	MEM05
MEM15002A	Apply quality systems	MEM05
MEM15003B	Use improvement processes in team activities	MEM05
MEM15004B	Perform inspection	MEM05
MEM15005B	Select and control inspection processes and procedures	MEM05
MEM15007B	Conduct product and/or process capability studies	MEM05
MEM15008B	Perform advanced statistical quality control	MEM05
MEM15010B	Perform laboratory procedures	MEM05
MEM15011B	Exercise external quality assurance	MEM05
MEM15012B	Maintain/supervise the application of quality procedures	MEM05
MEM15024A	Apply quality procedures	MEM05
MEM16002C	Conduct formal interviews and negotiations	MEM05
MEM16003B	Provide advanced customer service	MEM05
MEM16005A	Operate as a team member to conduct manufacturing,	MEM05

	engineering or related activities	
MEM16006A	Organise and communicate information	MEM05
MEM16007A	Work with others in a manufacturing, engineering or related environment	MEM05
MEM16008A	Interact with computing technology	MEM05
MEM16009A	Research and analyse engineering information	MEM05
MEM16010A	Write reports	MEM05
MEM16011A	Communicate with individuals and small groups	MEM05
MEM16012A	Interpret technical specifications and manuals	MEM05
MEM16013A	Operate in a self-directed team	MEM05
MEM17001B	Assist in development and deliver training in the workplace	MEM05
MEM17003A	Assist in the provision of on the job training	MEM05
MEM18001C	Use hand tools	MEM05
MEM18002B	Use power tools/hand held operations	MEM05
MEM18003C	Use tools for precision work	MEM05
MEM18006C	Repair and fit engineering components	MEM05
MEM18010C	Perform equipment condition monitoring and recording	MEM05
MEM18016B	Analyse plant and equipment condition monitoring results	MEM05
MEM18038B	Maintain wheels and tyres	MEM05
MEM18045B	Fault find/repair electrical equipment/components up to 250 volts single phase supply	MEM05
MEM18055B	Dismantle, replace and assemble engineering components	MEM05
MEM22001A	Perform engineering activities	MEM05
MEM22002A	Manage self in the engineering environment	MEM05
MEM22007A	Manage environmental effects of engineering activities	MEM05
MEM22012A	Coordinate resources for an engineering project or operation	MEM05

MEM22013A	Coordinate engineering projects	MEM05
MEM22014A	Coordinate engineering-related manufacturing operations	MEM05
MEM22015A	Source and estimate engineering materials requirements	MEM05
MEM22017A	Coordinate continuous improvement and technical development in an engineering-related project or operation	MEM05
MEM22018A	Coordinate sales and promotion of engineering-related products or services	MEM05
MEM23001A	Apply advanced mathematical techniques in a manufacturing engineering or related environment	MEM05
MEM23003A	Operate and program computers and/or controllers in engineering situations	MEM05
MEM23004A	Apply technical mathematics	MEM05
MEM23006A	Apply fluid and thermodynamics principles in engineering	MEM05
MEM23007A	Apply calculus to engineering tasks	MEM05
MEM23041A	Apply basic scientific principles and techniques in mechanical engineering situations	MEM05
MEM23063A	Select and test mechanical engineering materials	MEM05
MEM23064A	Select and test mechatronic engineering materials	MEM05
MEM23109A	Apply engineering mechanics principles	MEM05
MEM23111A	Select electrical equipment and components for engineering applications	MEM05
MEM23112A	Investigate electrical and electronic controllers in engineering applications	MEM05
MEM23113A	Evaluate hydrodynamic systems and system components	MEM05
MEM23114A	Evaluate thermodynamic systems and components	MEM05
MEM23115A	Evaluate fluid power systems	MEM05
MEM23116A	Evaluate programmable logic controller and related control system component applications	MEM05
MEM23117A	Evaluate microcontroller applications	MEM05

MEM23118A	Apply production and service control techniques	MEM05
MEM23119A	Evaluate continuous improvement processes	MEM05
MEM23120A	Select mechanical machine and equipment components	
MEM23121A	Analyse loads on frames and mechanisms	MEM05
MEM23122A	Evaluate computer integrated manufacturing systems	MEM05
MEM23123A	Evaluate manufacturing processes	MEM05
MEM23124A	Measure and analyse noise and vibration	MEM05
MEM23125A	Evaluate maintenance systems	MEM05
MEM24001B	Perform basic penetrant testing	MEM05
MEM24002B	Perform penetrant testing	MEM05
MEM24003B	Perform basic magnetic particle testing	MEM05
MEM24004B	Perform magnetic particle testing	MEM05
MEM24005B	Perform basic eddy current testing	MEM05
MEM24006B	Perform eddy current testing	MEM05
MEM24007B	Perform ultrasonic thickness testing	MEM05
MEM24008B	Perform ultrasonic testing	MEM05
MEM24009B	Perform basic radiographic testing	MEM05
MEM24010B	Perform radiographic testing	MEM05
MEM24011B	Establish non-destructive tests	MEM05
MEM24012C	Apply metallurgy principles	MEM05
MEM30005A	Calculate force systems within simple beam structures	MEM05
MEM30006A	Calculate stresses in simple structures	MEM05
MEM30007A	Select common engineering materials	MEM05
MEM30008A	Apply basic economic and ergonomic concepts to evaluate engineering applications	MEM05

MEM30009A	Contribute to the design of basic mechanical systems	MEM05
MEM30010A	Set up basic hydraulic circuits	MEM05
MEM30011A	Set up basic pneumatic circuits	MEM05
MEM30012A	Apply mathematical techniques in a manufacturing engineering or related environment	MEM05
MEM30013A	Assist in the preparation of a basic workplace layout	MEM05
MEM30014A	Apply basic just in time systems to the reduction of waste	MEM05
MEM30015A	Develop recommendations for basic set up time improvements	MEM05
MEM30016A	Assist in the analysis of a supply chain	MEM05
MEM30017A	Use basic preventative maintenance techniques and tools	MEM05
MEM30018A	Undertake basic process planning	MEM05
MEM30019A	Use resource planning software systems in manufacturing	MEM05
MEM30020A	Develop and manage a plan for a simple manufacturing related project	MEM05
MEM30021A	Prepare a simple production schedule	MEM05
MEM30022A	Undertake supervised procurement activities	MEM05
MEM30023A	Prepare a simple cost estimate for a manufactured product	MEM05
MEM30024A	Participate in quality assurance techniques	MEM05
MEM30025A	Analyse a simple electrical system circuit	MEM05
MEM30027A	Prepare basic programs for programmable logic controllers	MEM05
MEM30028A	Assist in sales of technical products/systems	MEM05
MEM30031A	Operate computer-aided design (CAD) system to produce basic drawing elements	MEM05
MEM30032A	Produce basic engineering drawings	MEM05
MEM30033A	Use computer-aided design (CAD) to create and display 3-D models	MEM05

MSL913001A	Communicate with other people	MSL09
MSL913002A	Plan and conduct laboratory/field work	MSL09
MSL922001A	Record and present data	MSL09
MSL933001A	Maintain the laboratory/field workplace fit for purpose	MSL09
MSL933002A	Contribute to the achievement of quality objectives	MSL09
MSL933003A	Apply critical control point requirements	MSL09
MSL934001A	Contribute to the ongoing development of HACCP plans	MSL09
MSL934002A	Apply quality system and continuous improvement processes	MSL09
MSL943001A	Work safely with instruments that emit ionising radiation	MSL09
MSL943002A	Participate in laboratory/field workplace safety	MSL09
MSL952001A	Collect routine site samples	MSL09
MSL952002A	Handle and transport samples or equipment	MSL09
MSL953001A	Receive and prepare samples for testing	MSL09
MSL954001A	Obtain representative samples in accordance with sampling plan	MSL09
MSL963001A	Operate basic handblowing equipment	MSL09
MSL963002A	Repair glass apparatus using simple glassblowing equipment	MSL09
MSL973001A	Perform basic tests	MSL09
MSL973002A	Prepare working solutions	MSL09
MSL973003A	Prepare culture media	MSL09
MSL973004A	Perform aseptic techniques	MSL09
MSL973005A	Assist with fieldwork	MSL09
MSL973006A	Prepare trial batches for evaluation	MSL09
MSL973007A	Perform microscopic examination	MSL09
MSL973012A	Assist with geotechnical site investigations	MSL09

MSL974001A	Prepare, standardise and use solutions	MSL09
MSL974002A	Conduct geotechnical site investigations	MSL09
MSL974003A	Perform chemical tests and procedures	MSL09
MSL974005A	Perform physical tests	MSL09
MSL974010A	Perform mechanical tests	MSL09
MSL975016A	Perform complex tests to measure engineering properties of materials	MSL09
MSS015002A	Develop strategies for more sustainable use of resources	MSS11
MSS015015A	Evaluate sustainability impact of a process	MSS11
MSS402010A	Manage the impact of change on own work	MSS11
MSS403010A	Facilitate change in an organisation implementing competitive systems and practices	MSS11
MSS403011A	Facilitate implementation of competitive systems and practices	MSS11
MSS403013A	Lead team culture improvement	MSS11
MSS405010A	Manage relationships with non-customer external organisations	MSS11
MSS405011A	Manage people relationships	MSS11
MSS405012A	Manage workplace learning	MSS11
MSS402001A	Apply competitive systems and practices	MSS11
MSS402002A	Sustain process improvements	MSS11
MSS403001A	Implement competitive systems and practices	MSS11
MSS403002A	Ensure process improvements are sustained	MSS11
MSS405001A	Develop competitive systems and practices for an organisation	MSS11
MSS405002A	Analyse and map a value stream	MSS11
MSS405003A	Manage a value stream	MSS11

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MSS405004A	Develop business plans in an organisation implementing competitive systems and practices	MSS11
MSS405005A	Manage competitive systems and practices responding to individual and unique customer orders	MSS11
MSS402020A	Apply quick changeover procedures	MSS11
MSS402021A	Apply Just in Time procedures	MSS11
MSS402030A	Apply cost factors to work practices	MSS11
MSS402031A	Interpret product costs in terms of customer requirements	MSS11
MSS402040A	Apply 5S procedures	MSS11
MSS402050A	Monitor process capability	MSS11
MSS402051A	Apply quality standards	MSS11
MSS402060A	Use planning software systems in operations	MSS11
MSS402061A	Use SCADA systems in operations	MSS11
MSS402080A	Undertake root cause analysis	MSS11
MSS402081A	Contribute to the application of a proactive maintenance strategy	MSS11
MSS403021A	Facilitate a Just in Time system	MSS11
MSS403030A	Improve cost factors in work practices	MSS11
MSS403032A	Analyse manual handling processes	MSS11
MSS403040A	Facilitate and improve implementation of 5S	MSS11
MSS403041A	Facilitate breakthrough improvements	MSS11
MSS404050A	Undertake process capability improvements	MSS11
MSS403051A	Mistake proof an operational process	MSS11
MSS404052A	Apply statistics to operational processes	MSS11
MSS404060A	Facilitate the use of planning software systems in a work area or team	MSS11
MSS404061A	Facilitate the use of SCADA systems in a team or work area	MSS11

MSS404081A	Undertake proactive maintenance analyses	MSS11
MSS404082A	Assist in implementing a proactive maintenance strategy	MSS11
MSS404083A	Support proactive maintenance	MSS11
MSS405020A	Develop quick changeover procedures	MSS11
MSS405021A	Develop a Just in Time system	MSS11
MSS405022A	Design a process layout	MSS11
MSS405023A	Develop a levelled pull system for operations and processes	MSS11
MSS405030A	Optimise cost of product or service	MSS11
MSS405031A	Undertake value analysis of a product or process costs in terms of customer requirements	MSS11
MSS405032A	Analyse cost implications of maintenance strategy	MSS11
MSS405040A	Manage 5S system in an organisation	MSS11
MSS405041A	Implement improvement systems in an organisation	MSS11
MSS405050A	Determine and improve process capability	MSS11
MSS405052A	Design an experiment	MSS11
MSS405053A	Manage application of six sigma for process control and improvement	MSS11
MSS405060A	Develop the application of enterprise control systems in an organisation	MSS11
MSS405061A	Determine and establish information collection requirements and processes	MSS11
MSS405070A	Develop and manage sustainable energy practices	MSS11
MSS405075A	Facilitate the development of a new product*	MSS11
MSS405081A	Develop a proactive maintenance strategy	MSS11
MSS405082A	Adapt a proactive maintenance strategy to the process operations sector	MSS11
MSS405083A	Adapt a proactive maintenance strategy for a seasonal or cyclical business	MSS11

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PMAOHS310B	Investigate incidents	PMA08
PMAOHS420B	Develop First Aid procedures and manage resources	PMA08
PMAOMIR407B	Audit incident preparedness and established response system	PMA08
PMAOMIR418B	Coordinate incident response	PMA08
PMAOMIR424B	Develop and maintain community relationships	PMA08
PMAOMIR430B	Conduct and assess incident exercises	PMA08
PMAOMIR444B	Develop incident containment tactics	PMA08
PMAOMIR449B	Monitor legal compliance obligations during incidents	PMA08
PMAOPS101C	Read dials and indicators	PMA08
PMAOPS280B	Interpret process plant schematics	PMA08
PMAOPS350B	Match and adjust colour	PMA08
PMAOPS402A	Respond to abnormal process situations	PMA08
PMAOPS405A	Operate complex control systems	PMA08
PMAOPS410B	Monitor remote production facilities	PMA08
PMAOPS411B	Manage plant shutdown and restart	PMA08
PMAOPS450B	Solve colour problems	PMA08
PMAOPS500A	Optimise production systems	PMA08
PMAOPS550B	Develop a colour formulation	PMA08
PMAOPS600C	Modify plant	PMA08
PMASUP410B	Develop plant documentation	PMA08
PMASUP420B	Minimise environmental impact of process	PMA08
PMASUP432B	Coordinate pipeline projects	PMA08
PMASUP440B	Commission/recommission plant	PMA08
PMASUP441C	Decommission plant	PMA08
PMASUP445A	Participate in HAZOP studies	PMA08

PMASUP520B	Review procedures to minimise environmental impact of process	PMA08
PMASUP540B	Analyse equipment performance	PMA08
PMBFIN201C	Finish products and components	PMB07
PMBFIN205C	Hand decorate products	PMB07
PMBHAN103C	Shift materials safely by hand	PMB07
PMBPREP205C	Assemble materials and equipment for production	PMB07
PMBPREP206C	Prepare materials to formulae	PMB07
PMBPREP301C	Set up and prepare for production	PMB07
PMBPREP303C	Set up equipment for continuous operation	PMB07
PMBPREP304C	Set a die	PMB07
PMBPREP305B	Change extrusion die and setup	PMB07
PMBPROD221B	Operate rotational moulding equipment	PMB07
PMBPROD235C	Use materials and process knowledge to complete work operations	PMB07
PMBPROD236C	Operate hand held air/power equipment for production processes	PMB07
PMBPROD240C	Cut materials	PMB07
PMBPROD241C	Lay up rubber lining or lag pulleys	PMB07
PMBPROD242A	Bond polymers to surfaces	PMB07
PMBPROD247C	Hand lay up composites	PMB07
PMBPROD248C	Prepare surfaces for coating	PMB07
PMBPROD265C	Operate portable vulcanising equipment	PMB07
PMBPROD321B	Produce rotational moulded products	PMB07
PMBPROD323C	Produce powder coated products	PMB07
PMBPROD347B	Produce composites using hand lamination	PMB07

PMBPROD375B	Vulcanise products using an autoclave	PMB07
PMBPROD380B	Produce composites using chopper gun/depositor	PMB07
PMBPROD430B	Trial a new die/tool	PMB07
PMBPROD431B	Trial a new, advanced or complex mould	PMB07
PMBTECH301B	Use material and process knowledge to solve problems	PMB07
PMBTECH302A	Modify existing compounds	PMB07
PMBTECH303A	Make minor modifications to products	PMB07
PMBTECH401B	Predict polymer properties and characteristics	PMB07
PMBTECH402B	Set advanced or complex dies	PMB07
PMBTECH403B	Test fibre-composites materials and laminates	PMB07
PMBTECH404B	Mould chemical resistant and/or fire retardant fibre-composites	PMB07
PMBTECH405B	Repair damaged fibre-composites structures	PMB07
PMBTECH406A	Diagnose production equipment problems	PMB07
PMBTECH501B	Analyse equipment performance	PMB07
PMBTECH502B	Review and analyse production trials and specify retrials	PMB07
PMBTECH503B	Determine rheology and output of plastics materials from processing equipment	PMB07
PMBTECH504B	Determine heat transfer loads for processing equipment	PMB07
PMBTECH505B	Choose polymer materials for an application	PMB07
PMBTECH506B	Analyse the design of products and tools	PMB07
PMBTECH507B	Develop fibre composite products using cored-laminate techniques	PMB01
PMBTECH508A	Develop a new compound	PMB07
PMBTECH509A	Modify an existing product	PMB07
PMBTECH510A	Analyse failure in polymeric materials	PMB07

PMBTECH601B	Develop a new product	PMB07
PMBTECH602B	Develop a new die or tool	PMB07
PMBTECH603B	Design structural/mechanical polymer components	PMB07
PMC554020D	Design and prepare models, moulds and dies	PMC10
PMC554090B	Undertake simple refractory design	PMC10
PMC554091B	Analyse refractory failures	PMC10
PSPGOV408A	Value diversity	PSP04
PSPPM402B	Manage simple projects	PSP04
PSPPM501B	Design complex projects	PSP04
PSPPM502B	Manage complex projects	PSP04
PSPPM503B	Close complex projects	PSP04
RIIOHS204A	Work safely at heights	RII09
RIIRIS201B	Conduct local risk control	RII09
SIRXCCS201	Apply point-of-sale handling procedures	SIR07
SIRXINV004A	Buy merchandise	SIR07
SIRXMER303	Coordinate merchandise presentation	SIR07
SIRXMER004A	Manage merchandise and store presentation	SIR07
SIRXRSK001A	Minimise theft	SIR07
SIRXRSK002A	Maintain store security	SIR07
SIRXSLS002A	Advise on products and services	SIR07
SITXMGT501	Establish and conduct business relationships	SIT07
SITXMPR401	Coordinate production of brochures and marketing materials	SIT07
SITXMPR402	Create a promotional display or stand	SIT07
SITXMPR404	Coordinate marketing activities	SIT07
TAEASS401B	Plan assessment activities and processes	TAE10

TAEASS402B	Assess competence	TAE10
TAEASS403B	Participate in assessment validation	TAE10
TAEDEL301A	Provide work skill instruction	TAE10
TLIA5058A	Manage facility and inventory requirements	TLI10
TLID2010A	Operate a forklift	TLI10
TLIL4059A	Implement asset management systems	TLI10
TLIL5055A	Manage a supply chain	TLI10
TLIP4013A	Implement and monitor logistics planning and process	TLI10
TLIR4003A	Negotiate a contract	TLI10
TLIR4008A	Implement and supervise stocktaking procedures	TLI10
TLIR4009A	Implement purchasing systems	TLI10
TLIR4010A	Plan purchasing	TLI10
TLIR5005A	Manage a contract	TLI10
TLIR5006A	Develop, implement and review purchasing strategies	TLI10
TLIX5015A	Establish supply chains	TLI10
UEGNSG604B	Fill gas cylinders	UEG06
UEPMNT420A	Perform Electrical/Electronic Drafting	UEP06

MSA07v8.2 Mapping

MSA qualifications not carried forward

Notes:

• The Competitive Manufacturing qualifications were superseded in April 2012 by the Competitive Systems and Practices qualifications endorsed in MSS11v2.
• The Competitive Manufacturing qualifications have not been carried forward in version 8.2 of MSA07, but remain available in the system as part of previous versions of this Training Package.
• Refer to the summary mapping in MSS11v2 for details: MSS11.

Code	Title	Comment
MSA21108	Certificate II in Competitive Manufacturing	Superseded by MSS20312
MSA31108	Certificate III in Competitive Manufacturing	Superseded by MSS30312
MSA41108	Certificate IV in Competitive Manufacturing	Superseded by MSS40312
MSA51108	Diploma of Competitive Manufacturing	Superseded by MSS50312
MSA61108	Advanced Diploma of Competitive Manufacturing	Superseded by MSS60312
MSA71109	Vocational Graduate Certificate II in Competitive Manufacturing	Superseded by MSS70312
MSA81109	Vocational Graduate Diploma of Competitive Manufacturing	Superseded by MSS80312

MSA units not carried forward

Code	Comment
All MSACM units	Superseded by new units endorsed in MSS11v2 – Refer to MSS11v2 for details

Updated Skill Sets

Code	Title	Comment

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MSASS00004	Leading Hand_Supervisor	New Release – Unit grid updated – no change in outcomes
MSASS00005	Licence to operate a standard boiler	New Release – Title corrected to 'licence' – no change in outcomes
MSASS00006	Licence to operate an advanced boiler	New Release - Title corrected to 'licence' – no change in outcomes

Updated qualifications

Code	Title	Comment
MSA20510	Certificate II in Recreational Vehicle Service and Repair	New release – AU imported elective units updated
MSA20610	Certificate II in Recreational Vehicle Manufacture	New release – Au imported elective units updated
MSA30107	Certificate III in Process Manufacturing	New release - One MEM imported elective unit updated
MSA30208	Certificate III in Manufacturing Technology	New release - MEM imported elective units updated
MSA30510	Certificate III in Recreational Vehicle Service and Repair	New release – AU imported elective units updated
MSA30610	Certificate III in Recreational Vehicle Manufacture	New release – AU imported elective units updated
MSA30710	Certificate III in Recreational Vehicle and Accessories and Retailing	New release – AU and SI imported elective units updated
MSA40108	Certificate IV in Manufacturing Technology	New release - MEM imported elective units updated
MSA40311	Certificate IV in Process Manufacturing	New release - MEM and TAE imported elective units updated
MSA40510	Certificate IV in Recreational Vehicles	New release – AU and TAE imported elective units updated, plus one MEM unit

MSA40710	Certificate IV in Recreational Vehicle and Accessories Retailing	New release – AU, SI and TAE imported elective units updated, plus one MEM unit
MSA50108	Diploma of Manufacturing	New release – MEM imported elective units updated and additional MEM elective units added
MSA50311	Diploma of Production Management	New release – One BSB imported elective unit updated
MSA50510	Diploma of Recreational Vehicles	New release – AU imported elective units updated, two MEM imported elective units updated, one new MEM elective unit added
MSA60108	Advanced Diploma of Manufacturing Technology	New release – MEM imported elective units updated and additional MEM elective units added

Updated units of competency

Code	Title	Comment
MSAPMOHS510	Assess risk	New release – updated to be consistent with ISO 31000:2009 Risk Management – Principles and Guidelines. Previous unit referred to Australian Standard (AS/NZS4360, 1999). Equivalent
MSAPMOPS100A	Use equipment	New release – Minor clarification changes to application and range, and minor editorial corrections. Equivalent
MSAPMOPS200A	Operate equipment	New release – Minor clarifications to application and range, and minor editorial corrections.
MSAPMSUP300A	Identify and implement opportunities to maximise production efficiencies	New release 2 - Error in title of prerequisite unit corrected - Equivalent. No change to the prerequisite.
MSABLIC001	Licence to operate a standard boiler	New Release – Title corrected to 'licence' – no change in outcomes

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MSABLIC002	Licence to operate an advanced boiler	New Release - Title corrected to 'licence' – no change in outcomes

Imported units not carried forward

Code	Title	Comment	E/NE
AUM3003B	Document designs	Replaced by AUMFTA3001	E
AUM8012B	Prepare and document quotation	Replaced by AUMANA3001	E
AUM8081B	Apply trim to components	Replaced by AUMGTT2001	E
AURA354616A	Determine legal aspects of an automotive service and repair contract	Replaced by AURALA3001	E
AURA454516A	Determine retail rates for work	Replaced by AURAAA4002	E
AURC252327A	Identify, clarify and resolve problems	Replaced by AURAFA2004	NE
AURC270421A	Establish relations with customers	Replaced by AURACA2001	E
AURC361101A	Adapt work processes to new technologies	Replaced by AURAKA3002	E
AURC362721A	Establish customer requirements of a complex nature	Replaced by AURACA3002	E
AURC362807A	Build customer relations	Replaced by AURACA3003	E
AURC363337A	Maintain business image	Replaced by AURAMA3004	E
AURC365722A	Estimate complex jobs	Replaced by AURATA3005	E
AURC463238B	Manage complex customer issues	Replaced by AURAMA4005	E

AURC465349B	Prepare a vehicle repair quotation	Replaced by AURANN4001	E
AURC561614A	Contribute to business improvement	Replaced by AURAMA5006	E
AURE218670A	Service, maintain or replace batteries	Replaced by AURETR2015	NE
AURE218708A	Carry out repairs to single electrical circuits	Replaced by AURETR2012	NE
AURE220140A	Manufacture and repair wiring harness/looms	Replaced by AURETR2010	NE
AURE311666A	Repair electric braking systems	Replaced by AURETB3001	E
AURS238127A	Identify and select automotive parts and products	Replaced by AURSCA2001	E
AURS238150A	Present stock and sales area	Replaced by AURSCA2002	E
AURS241303A	Apply sales procedures	Replaced by AURSCA2003	E
AURS241608A	Carry out cash and/or credit/funds transfer transactions	Replaced by AURSCA2004	E
AURS241769A	Sell product(s)	Replaced by AURSCA2005	E
AURS241803A	Apply legal requirements relating to product sales	Replaced by AURSLA2001	E
AURS242621A	Promote products and services	Replaced by AURSCA2006	E
AURS252290A	Process customer complaints	Replaced by AURSAA2001	E
AURS338103A	Apply automotive parts interpretation process	Replaced by AURSBA3002	E
AURT210170A	Inspect and service braking systems	Replaced by AURTTB2001	E
AURT216170A	Inspect and service suspension systems	Replaced by	E

		AURTTD2004	
AURT217865A	Remove and refit wheel hubs and associated brake components	Replaced by AURTTJ2002	E
AURT365508A	Carry out vehicle safety/roadworthy inspection	Replaced by AURTTA3017	E
AURT577620A	Develop and document specifications and procedures	Replaced by AURAFA5007	E
AURT577727B	Estimate and calculate costs to repair, maintain or modify a vehicle	Replaced by AURTNA5001	E
AURV226965A	Remove and replace/fit protector mouldings, transfers and decals	Replaced by AURVTN2005	E
AURV230449A	Apply paint touch-up techniques	Replaced by AURVTP2007	E
AURV324866A	Repair fibreglass/composite material components	Replaced by AURVTS3004	E
AURV328366A	Repair chassis/frame and associated components	Replaced by AURTTY3001	E
AURV331423CA	Fabricate and install canvas products	Replaced by AURVTT3015	E
AURV331423DA	Fabricate and install frame structures	Replaced by AURVTT3016	E
AURV331423GA	Fabricate and install canopies and curtains	Replaced by AURVTT3019	E
AURV334031A	Install side windows	Replaced by AURVTG3011	E
AURV465116A	Determine vehicle damage and recommended repair procedures	Replaced by AURVTN4032	E
BSBWRK509A	Manage industrial relations	Replaced by BSBWRK510A	E
MEM09003B	Prepare basic engineering drawing	Replaced by MEM09024A	NE
MEM09004B	Perform electrical/electronic detail	Replaced by	NE

	drafting	MEM09205A*	
MEM09010C	Create 3D models using computer aided design system	Replaced by MEM09210A*	NE
MEM09021B	Interpret and produce curved 3-dimensional shapes	Replaced by MEM09216A	NE
MEM09141A	Represent mechanical engineering designs	Replaced by MEM09157A	NE
MEM09142A	Represent mechatronic engineering designs	Replaced by MEM09158A	NE
MEM09151A	Apply computer aided modelling and data management techniques to mechanical engineering designs	Replaced by MEM09155A* (*MEM23004A, MEM23109A*)	NE
MEM09152A	Apply computer aided modelling and data management techniques to mechatronic engineering designs	Replaced by MEM09156A* (*MEM23004A, MEM23109A, MEM23111A, MEM23112A*)	NE
MEM14061A	Plan and design mechanical engineering projects	Replaced by MEM14085A* (*MEM23004A, MEM23109A*)	NE
MEM14062A	Plan and design mechatronic engineering projects	Replaced by MEM14086A* (*MEM23004A, MEM14090A, MEM23111A, MEM23112A*)	NE
MEM14063A	Plan and design manufacturing engineering projects	Replaced by MEM14087A* (*MEM23004A, MEM14090A, MEM14089A, MEM23063A*)	NE
MEM14064A	Plan and design maintenance engineering projects	Replaced by MEM14088A*	NE

		(*MEM23004A, MEM14092A*)	
MEM14081A	Apply mechanical engineering fundamentals to support design and development of projects	Replaced by MEM14089A* (*MEM23004A, MEM23109A*)	NE
MEM14082A	Apply mechatronics fundamentals to support design and development of engineering projects	Replaced by MEM14090A* (*MEM23004A, MEM23111A, MEM23112A*)	NE
MEM22003A	Manage engineering resources	Replaced by MEM22012A	NE
MEM22004A	Manage engineering projects	Replaced by MEM22013A	NE
MEM22005A	Manage engineering operations	Replaced by MEM22014A* (*MEM23004A, MEM14091A*)	NE
MEM22006A	Source and estimate materials	Replaced by MEM22015A	NE
MEM22008A	Manage change and technical development	Replaced by MEM22017A	NE
MEM22009A	Manage technical sales and promotion	Replaced by MEM22018A	NE
MEM23002A	Apply calculus in engineering situations	Replaced by MEM23007A* (*MEM23004A*)	NE
MEM23051A	Apply basic electro and control scientific principles and techniques in mechanical and manufacturing engineering situations	Replaced by MEM23111A* and MEM23112A* (*MEM23004A, MEM23006A*)	NE
MEM23061A	Select and test mechanical engineering materials	Replaced by MEM23063A* (*MEM23004A,	NE

		MEM23109A)	
MEM23062A	Select and test mechatronic engineering materials	Replaced by MEM23064A* *(MEM23004A, MEM23109A)*	NE
MEM23071A	Select and apply mechanical engineering methods, processes and construction techniques	Replaced by MEM14089A* *(MEM23004A, MEM23109A)*	NE
MEM23072A	Select and apply mechatronic engineering methods, processes and construction techniques	Replaced by MEM14090A* *(MEM23004A, MEM23109A, MEM23111A, MEM23112A)*	NE
MEM23081A	Apply scientific principles and techniques in mechanical engineering situations	Replaced by MEM23113A*, MEM23114A*, MEM23115A* *(MEM23004A, MEM23006A)*	NE
MEM23082A	Apply scientific principles and techniques in mechatronic engineering situations	Replaced by MEM23116A* and MEM23117A* *(MEM23004A, MEM23111A, MEM23112A)*	NE
MEM23083A	Apply industrial engineering principles and techniques in competitive manufacturing engineering situations	Replaced by MEM23118A* and MEM23119A* *(MEM30012A, MEM23118A)*	NE
MEM23091A	Apply mechanical system design principles and techniques in mechanical engineering situations	Replaced by MEM23120* and MEM23121A* *(MEM23004A, MEM23109A, MEM23007A)*	NE

MEM23092A	Apply automated systems principles and techniques in engineering situations	Replaced by MEM23122A* (*MEM23004A, MEM23111A, MEM23112A*)	NE
MEM23093A	Apply plant and process design principles and techniques in engineering situations	Replaced by MEM23123A	NE
MEM23094A	Apply maintenance systems principles and techniques in engineering situations	Replaced by MEM23124A* and MEM23125A* (*MEM23004A, MEM14092A, MEM14088A*)	NE
MEM30001A	Use computer aided drafting systems to produce basic engineering drawings	Replaced by MEM30031A	NE
MEM30002A	Produce basic engineering graphics	Replaced by MEM30032A	NE
MEM30003A	Produce detailed engineering drawings	Covered by MEM30032A	NE
MEM30004A	Use CAD to create and display 3D models	Replaced by MEM30033A* (*MEM3001A*)	NE

Overview

What is a Training Package?

A Training Package is an integrated set of nationally endorsed competency standards, assessment guidelines and Australian Qualifications Framework (AQF) qualifications for a specific industry, industry sector or enterprise.
Each Training Package:

- provides a consistent and reliable set of components for training, recognising and assessing peoples skills, and may also have optional support materials
- enables nationally recognised qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training which suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

How do Training Packages fit within the National Skills Framework?
The National Skills Framework applies nationally, is endorsed by the Ministerial Council for Vocational and Technical Education, and comprises the Australian Quality Training Framework 2010 (AQTF 2010), and Training Packages endorsed by the National Quality Council (NQC).

How are Training Packages developed?
Training Packages are developed by Industry Skills Councils or enterprises to meet the identified training needs of specific industries or industry sectors. To gain national endorsement of Training Packages, developers must provide evidence of extensive research, consultation and support within the industry area or enterprise.

How do Training Packages encourage flexibility?
Training Packages describe the skills and knowledge needed to perform effectively in the workplace without prescribing how people should be trained.

Training Packages acknowledge that people can achieve vocational competency in many ways by emphasising what the learner can do, not how or where they learned to do it. For example, some experienced workers might be able to demonstrate competency against the units of competency, and even gain a qualification, without completing a formal training program.

With Training Packages, assessment and training may be conducted at the workplace, off-the-job, at a training organisation, during regular work, or through work experience, work placement, work simulation or any combination of these.

**Who can deliver and assess using Training Packages?**
Training and assessment using Training Packages must be conducted by a Registered Training Organisation (RTO) that has the qualifications or specific units of competency on its scope of registration, or that works in partnership with another RTO, as specified in the AQTF 2010.

Training Package Components
Training Packages are made up of mandatory components endorsed by the NQC, and optional support materials.

Training Package Endorsed Components

The nationally endorsed components include the Competency Standards, Assessment Guidelines and Qualifications Framework. These form the basis of training and assessment in the Training Package and, as such, they must be used.
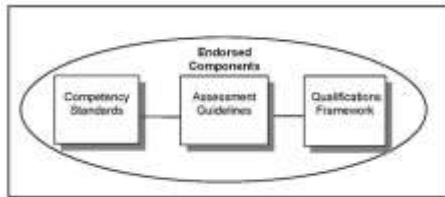
Competency Standards

Each unit of competency identifies a discrete workplace requirement and includes the knowledge and skills that underpin competency as well as language, literacy and numeracy; and occupational health and safety requirements. The units of competency must be adhered to in training and assessment to ensure consistency of outcomes.

Assessment Guidelines

The Assessment Guidelines provide an industry framework to ensure all assessments meet industry needs and nationally agreed standards as expressed in the Training Package and the AQTF 2010. The Assessment Guidelines must be followed to ensure the integrity of assessment leading to nationally recognised qualifications.

Qualifications Framework

Each Training Package provides details of those units of competency that must be achieved to award AQF qualifications. The rules around which units of competency can be combined to make up a valid AQF qualification in the Training Package are referred to as the 'packaging rules'. The packaging rules must be followed to ensure the integrity of nationally recognised qualifications issued.

Training Package Support Materials

The endorsed components of Training Packages are complemented and supported by optional support materials that provide for choice in the design of training and assessment to meet the needs of industry and learners.

Training Package support materials can relate to single or multiple units of competency, an industry sector, a qualification or the whole Training Package. They tend to fall into one or more of the categories illustrated below.

Training Package support materials are produced by a range of stakeholders such as RTOs, individual trainers and assessors, private and commercial developers and Government agencies.

Training Package, Qualification and Unit of Competency Codes

There are agreed conventions for the national codes used for Training Packages and their components. Always use the correct codes, exactly as they appear in the Training Package, **and with the code always before the title**.

Training Package Codes

Each Training Package has a unique five-character national code assigned when the Training Package is endorsed, for example XYZ08. The first three characters are letters identifying the Training Package industry coverage and the last two characters are numbers identifying the year of endorsement.

Qualification Codes

Within each Training Package, each qualification has a unique eight-character code, for example XYZ10108. Qualification codes are developed as follows:

- the first three letters identify the Training Package;
- the first number identifies the qualification level (noting that, in the qualification titles themselves, arabic numbers are **not** used);
- the next two numbers identify the position in the sequence of the qualification at that level; and
- the last two numbers identify the year in which the qualification was endorsed. (Where qualifications are added after the initial Training Package endorsement, the last two numbers may differ from other Training Package qualifications as they identify the year in which those particular qualifications were endorsed.)

Unit of Competency Codes

Within each Training Package, each unit of competency has a unique code. Unit of competency codes are assigned when the Training Package is endorsed, or when new units of competency are added to an existing endorsed Training Package. Unit codes are developed as follows:

- a typical code is made up of 12 characters, normally a mixture of uppercase letters and numbers, as in MSACMC210A:
- the first three characters signify the Training Package – MSA07 – in the above example and up to eight characters, relating to an industry sector, function or skill area, follow;
- the last character is always a letter and identifies the unit of competency version. An 'A' at the end of the code indicates that this is the original unit of competency. 'B', or another incremented version identifier means that minor changes have been made. Typically this would mean that wording has changed in the range statement or evidence guide, providing clearer intent; and
- where changes are made that alter the outcome, a new code is assigned and the title is changed.

Training Package, Qualification and Unit of Competency Titles

There are agreed conventions for titling Training Packages and their components. Always use the correct titles, exactly as they appear in the Training Package, and with the code always placed before the title.

Training Package Titles

The title of each endorsed Training Package is unique and relates the Training Packages broad industry coverage.

Qualification Titles

The title of each endorsed Training Package qualification is unique. Qualification titles use the following sequence:

- first, the qualification is identified as either Certificate I, Certificate II, Certificate III, Certificate IV, Diploma, Advanced Diploma, Vocational Graduate Certificate, or Vocational Graduate Diploma;
- this is followed by the words 'in' for Certificates I to IV, and 'of' for Diploma, Advanced Diploma, Vocational Graduate Certificate and Vocational Graduate Diploma;
- then, the industry descriptor, for example Telecommunications; and
- then, if applicable, the occupational or functional stream in brackets, for example (Computer Systems).

For example: MSA10107 Certificate I in Manufacturing (Pathways)

Unit of Competency Titles

Each unit of competency title is unique. Unit of competency titles describe the competency outcome concisely, and are written in sentence case.

For example: MSACMC210A Manage the impact of change on own work

Introduction to the Manufacturing Training Package (MSA07) Training Package

This Training Package has been developed as a significant step in the process of Training Package rationalisation work being undertaken by Manufacturing Skills Australia. There was an identified need for a 'whole of manufacturing' approach to many of the qualifications and units of competency contained in some of the manufacturing sector Training Packages.

Version 1

Certificate I in Manufacturing (Pathways)

The first qualification and units of competency to populate this new Training Package was the MSA10107 Certificate 1 in Manufacturing (Pathways). This will be followed closely by more units of competency and qualifications that will be applicable across all of manufacturing.

Refer to the Appendices attached to this Training Package for information on development of this certificate.

Version 2

Process Manufacturing Certificates

The process manufacturing certificates have been developed for use by the industry sectors covered by the following Training Packages:

- PMA02 Chemical, Hydrocarbons and Oil Refining Training Package
- PMB07 Plastics, Rubber and Cablemaking Training Package
- PMC04 Manufactured Mineral Products Training Package.

In the recently completed review of the Plastics, Rubber and Cablemaking Training Package it was determined that the production support certificates in PMA, PMB and PMC should be rationalised to increase flexibility and recognition across all of process manufacturing.

In keeping with the high market penetration of the Certificates in Process Manufacturing in PMB01, this title has been maintained for the common certificates. The certificates have been generalised and recoded for inclusion on MSA07 and as such, will be available across all of process manufacturing. This makes the elective units from PMA, PMB and PMC all available for selection in a Certificate in Process Manufacturing.

Other generic units

In addition to the generic support units developed for the Process Manufacturing Certificates, it has been recognised that there would be significant benefits to be gained from rationalising other units in PMA, PMB and PMC. A range of units have been developed for inclusion in MSA07, not aligned to any MSA qualifications at this time. These units are intended to be used as imported electives in the Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC.

Refer to the Appendices for more details on development of the above certificates.

Version 3

MCM04 qualifications, new specialist streams for Technology Cadetship qualifications

Relocation of the MCM units and qualifications to MSA07 is the first step in a major rationalisation plan which will eventually see all the units and qualifications from the nine manufacturing Training Packages under the one framework. The changes are summarised below.

- The Competitive Manufacturing and Manufacturing Technology qualifications and units of competency have been recoded as MSA units and qualifications.
- The Competitive Manufacturing qualifications have been revised to incorporate units of competency covering sustainability skills and to include Employability Skills Summaries.
- All existing MCM units have been updated to replace Key Competencies with Employability Skills.
1) The MSAPMPER units and one MSAPMOHS unit have been revised as part of the current review of the Chemical, Hydrocarbons & Oil Refining Training Package.
- MSA07v2 qualifications (MSA10107, MSA10207, MSA20107 and MSA30107) updated with recoded MCM units, revised MSAPMPER units and updated LMT and LMF units.
- Addition of new metallurgy and polymer streams for the existing Certificate III in Manufacturing Technology.
- Addition of new polymer stream for the existing Certificate IV in Manufacturing Technology.
- Addition of Diploma and Advanced Diploma of Manufacturing Technology (metallurgy and polymer streams).

Full details on development of the Competitive Manufacturing qualifications and the new streams are included in the Appendices.

Version 3.1

New specialist stream for structural steel detailing in Technology Cadetship qualifications.

Six new units of competency for structural detailing and additional imported units have been added to the Manufacturing Technology qualifications to facilitate training of new entrants to this industry. Details of this development are included in the Appendices.

Version 4

Competitive Manufacturing Vocational Graduate qualifications

The need for development of Vocational Graduate qualifications in Competitive Manufacturing was identified by MSA in 2007 in response to requests for more in depth training and professional development for individuals who already had some skills or training in Competitive Manufacturing practices.

The following new qualifications are included in MSA07v4:

- MSA71109 Vocational Graduate Certificate in Competitive Manufacturing
- MSA81109 Vocational Graduate Diploma of Competitive Manufacturing

More information on this development is included in the Appendices.

Version 5

Certificate III in Surface Preparation and Coating Application

The surface preparation and protective coating application industry sector approached Manufacturing Skills Australia (MSA) in 2008 regarding the lack of a qualification for people working in this sector. MSA, the national Industry Skills Council with coverage of this area, responded to this concern by establishing a project in 2008 to 'research existing units and develop units of competency to cover blast cleaning and coating'.

This research project identified a significant number of relevant units of competency and the need for at least one new unit of competency to cover the skill needs of this sector. As a result of this research, it also became clear that to fully respond to the industry's need, a new qualification was required, utilising existing units in MEM05 and PMB07 and the proposed new unit(s).

Further research and consultation with the industry, the industry association and relevant RTOs identified that the appropriate level of qualification was AQF 3. MSA supported the findings and contracted Kevin Hummel, Total Training and Performance Solutions to develop the new units and packaging rules for a new Certificate III in Surface Preparation and Coating Application.

More information on this development is included in the Appendices.

Trade Measurement units and Skill Sets

In 2008, Manufacturing Skills Australia (MSA) contracted Ivan Johnstone, CIT Solutions, to undertake a scoping project to determine the scope of change required to update the Laboratory Operations Training Package (PML04). It was identified in that scoping project that because of changes to the regulatory environment for Australia's trade measurement system, there was a need to update/redevelop existing units of competency in MEM05 and/or develop new units to meet the needs of the National Measurement Institute (NMI).

- NMI is a Division of the Commonwealth Department of Innovation, Industry, Science and Research. The Institute is responsible for Australia's units and standards of measurement through the development and maintenance of standards of measurement, reference materials and reference techniques. The Institute has a wide variety of professional and technical staff who provide calibration, measurement, analysis, pattern approval testing and training services.

More information on this development is included in the Appendices.

Version 6

Recreational Vehicle qualifications

The recreational vehicle qualifications started with THC99 under the Tourism and Hospitality National Industry Training Advisory Board. This was revised to THC04 with minimal changes. With the merger of national ITABs into the ten Industry Skills Councils, THC04 came under the jurisdiction of the Service Industries Skills Councils. As the bulk of the use of these qualifications was in the fields of manufacture, service and repairs, it was realised that the recreational vehicle industry would be better served by bringing its qualifications under the coverage of the Manufacturing Industry Skills Council (Manufacturing Skills Australia – MSA). They have revised the qualifications and their associated units of competency and brought them into line with the current requirements and aligned them with similar manufacturing, service and repair qualifications.

This sector typically manufacture, repair and service recreational vehicles as required. Recreational vehicles include:

- motor homes
- caravans
- camper trailers
- slide-ons, and
- fifth wheelers

Recreational vehicles may be made from a frame (timber, aluminium or steel) and skin (aluminium or fibre composite) or a manufactured wall panel or some other technology. They are typically mounted on a steel chassis. Fittings are typically timber/particle board but may be any other suitable material.

More information on this development is included in the appendices.

Historical and General Information

Introduction to the Manufacturing Training Package (MSA07) Training Package

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Other generic units

In addition to the generic support units developed for the Process Manufacturing Certificates, it has been recognised that there would be significant benefits to be gained from rationalising other units in PMA, PMB and PMC. A range of units have been developed for inclusion in MSA07, not aligned to any MSA qualifications at this time. These units are intended to be used as imported electives in the Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC.

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- MSA07v2 qualifications (MSA10107, MSA10207, MSA20107 and MSA30107) updated with recoded MCM units, revised MSAPMPER units and updated LMT and LMF units.
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This research project identified a significant number of relevant units of competency and the need for at least one new unit of competency to cover the skill needs of this sector. As a result of this research, it also became clear that to fully respond to the industry's need, a new qualification was required, utilising existing units in MEM05 and PMB07 and the proposed new unit(s).

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Recreational Vehicle qualifications

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- caravans
- camper trailers
- slide-ons, and
- fifth wheelers

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More information on this development is included in the appendices.

Version 7

Process manufacturing
The Certificate 1 to Certificate III in Process Manufacturing exist as generalist manufacturing qualifications which include technical units, but do not require any minimum number of them.

When Total Training and Performance Solutions (TaPS) undertook the Manufactured Mineral Products Training Package update project in 2009, a report was made to Manufacturing Skills Australia (MSA) suggesting the extension of the generic Certificates in Process Manufacturing to Certificate IV and Diploma level. This need was coincidentally confirmed by a hydrocarbons company in the same timeframe.
The identified need was to provide qualifications for a career path for those who already hold the Certificate III in Process Manufacturing, and also to provide qualifications to support a non-technical career path for others with technical Certificates III (or IV). While it might be argued that the Competitive Manufacturing, or the FrontLine Management qualifications already provide that, they are not seen as providing the same flexible mix of industry units as the generic Process Manufacturing qualifications which are truncated at the Certificate III because of the history of their development.
MSA supported the findings and contracted TaPS to develop the new qualifications.

Industry drivers for change
The major industry drivers for the improvements to this package are outlined below:

- Currently the Certificates I – III in Process Manufacturing exist as generalist manufacturing qualifications which include technical units, but do not require any minimum number of them. It was seen as desirous to extend these qualifications to provide a career path for those who already hold the Certificate III in Process Manufacturing.
- It was also seen as advantageous to provide qualifications to support a non-technical career path for those with technical Certificates III (or IV).

Version 8

Components for endorsement:

- Two (2) new high risk work licensing boiler operation units of competency.

The new units of competency will not be aligned to any qualifications, but will be available for use in Skill Sets and for importation into other Training Package qualifications as required.

Project background
The development of the two new units of competency follows on from Safe Work Australia's Strategic Issues Group on Occupational Health and Safety (SIG-OHS) and the review process conducted through the licensing Temporary Advisory Group (TAG). The agreement from this process resulted in the current three licensing categories for boiler operation, standard, intermediate and advanced boilers being replaced by a two tier licensing system for standard and advanced boilers. The new licensing categories need to be underpinned by endorsed units of competency specifically designed to meet regulatory requirements for skills and knowledge and a unit format compatible with other high risk work licensing units of competency already endorsed in the CPC08 Construction, Plumbing and Services, TLI10 Transport and Logistics and other national Training Packages.

The new units of competency will be supported by mandatory Assessment Instructions and Resource Requirements documentation agreed by national regulators and achievement of competency against the units will meet the educational requirements for licensing in each category.

The new licensing units of competency are not attached to any MSA qualification but can be imported to any Training Package as required. The new units will also be available as Skill Sets to allow for training and assessment to occur to support the competency requirements for licensing of boiler operations.

History

The Manufacturing Training Package (MSA07) has been developed as part of the rationalisation work being undertaken by Manufacturing Skills Australia.

Version 1
MSA07v1 contained the Certificate I in Manufacturing (Pathways).

Version 2
MSA07v2 was expanded to include the newly developed Certificates I, II and III in Process Manufacturing which are for use across the three process manufacturing sectors covered by PMA, PMB and PMC Training Packages.

Also included in Version 2 were the following units of competency that are available for importation to Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC:

- MSAENV472A Implement and monitor environmentally sustainable work practices
- MSAENV672A Develop workplace policy and procedures for sustainability
- MSAPMOHS400A Contribute to OHS management system
- MSAPMOHS401A Assess risk
- MSAPMOHS503A Maintain the workplace OHS management system
- MSAPMOHS510A Manage risk
- MSAPMOHS601A Establish workplace OHS management system
- MSAPMOPS400A Optimise process/plant area
- MSAPMOPS401A Trial new process or product
- MSAPMOPS404A Co-ordinate maintenance
- MSAPMOPS405A Identify problems in fluid power system
- MSAPMOPS406A Identify problems in electronic control systems
- MSAPMSUP400A Develop and monitor quality systems

In Version 2, the PMB and process manufacturing units in MSA10107 Certificate I in Manufacturing (Pathways) were updated and recoded. Refer to Mapping of units for details.

Three environmental sustainability units have been developed by Manufacturing Skills Australia. They were included in the Process Manufacturing production support certificates and will be made available across all manufacturing Training Packages. The units are:

- MSAENV272A Participate in environmentally sustainable work practices
- MSAENV472A Implement and monitor environmentally sustainable work practices

- MSAENV672A Develop workplace policy and procedures for sustainability.

In version 3 (see below) these three units have been incorporated into the Competitive Manufacturing qualifications.

Version 3

Following are details of changes to MSA07v2:

- inclusion of the current Competitive Manufacturing and Manufacturing Technology qualifications and units of competency
- variation to existing Competitive Manufacturing qualifications to incorporate the three new units of competency covering sustainability skills and to include Employability Skills Summaries
- updating of existing MCM units to replace Key Competencies with Employability Skills
- updating of the MSAPMPER units and one MSAPMOHS unit which have been revised as part of the current review of the Chemical, Hydrocarbons & Oil Refining Training Package
- MSA07v2 qualifications (MSA10107, MSA10207, MSA20107 and MSA30107) updated with recoded MCM units, revised MSAPMPER units and updated LMT and LMF units.
- addition of new metallurgy and polymer pathways for the existing Certificate III in Manufacturing Technology
- addition of new polymer pathway for the existing Certificate IV in Manufacturing Technology
- addition of Diploma and Advanced Diploma of Manufacturing Technology (metallurgy and polymer pathways)

Version 3.1

- Version 3.1 includes six new MSA Technology Cadetship units and 10 additional MEM units as electives for a new structural steel detailing stream in MSA30208 Certificate III in Manufacturing Technology and MSA50108 Diploma of Manufacturing Technology.
- Miscellaneous typographical errors related to unit codes have been corrected in the unit tables in the following qualifications: MSA10107, MSA20107, MSA20208, MSA30208, MSA40108, MSA50108 and MSA60108.
- PMBPREP508A has been removed from the Manufacturing Technology elective bank in MSA50108 as it duplicates MEM09003B.

Version 4

Inclusion of two new Competitive Manufacturing Vocational Graduate qualifications and the following new units:

MSACMG700A	Review continuous improvement processes
MSACMG701A	Prepare for and implement change
MSACMG702A	Review manufacturing practice tools and techniques
MSACMG703A	Analyse process changes

MSACMG704A	Facilitate improvements in the value chain
MSACMG705A	Undertake a qualitative review of a process change
MSACMG706A	Build relationships between teams in a manufacturing environment
MSACMG707A	Respond to a major non-conformance
MSACMG708A	Capture learning from daily activities in a manufacturing organisation
MSACMG709A	Facilitate improvements in the external value chain
MSACMG710A	Improve visual management in the workplace
MSACMG711A	Manage benchmarking studies
MSACMG712A	Lead a problem solving process to determine and solve root cause
MSACMG800A	Analyse data for relevance to organisational learning
MSACMG801A	Develop the competitive manufacturing approach
MSACMG802A	Audit the use of competitive tools
MSACMG803A	Develop models of future state manufacturing practice
MSACMG804A	Develop the value chain
MSACMG805A	Develop the learning processes of the manufacturing organisation
MSACMG806A	Develop and refine systems for continuous improvement in manufacturing organisations
MSACMG807A	Develop problem solving capability of a manufacturing organisation

Version 5

New units of competency

Unit code	Unit title

Manufacturing Skills Australia

MSAPMOPS201A	Cut polymer materials
MSAPMOPS202A	Fabricate polymer materials
MSAPMOPS301A	Treat corrosion
MSATMINS301A	Inspect a range of simple measures
MSATMINS302A	Inspect a range of simple measuring instruments
MSATMINS401A	Inspect a range of weighing instruments
MSATMINS402A	Inspect a range of liquid measuring instruments using volume measures
MSATMINS403A	Inspect a range of trading practices
MSATMINS404A	Inspect a range of pre-packaged products
MSATMINS501A	Inspect a range of complex measuring instruments
MSATMREF301A	Use and maintain reference standards
MSATMVER301A	Verify simple measures
MSATMVER302A	Verify a simple measuring instruments
MSATMVER401A	Verify a limited weighing instrument
MSATMVER402A	Verify a liquid measuring instrument using volume measures
MSATMVER403A	Verify inspector's class reference standards
MSATMVER501A	Verify a complex measuring instrument

Additional imported units

MEM07001B	Perform operational maintenance of machines/equipment
MEM08002C	Pre-treat work for subsequent surface coating
MEM08007B	Control surface finish production and finished product quality
MEM08011B	Prepare surfaces using solvents and/or mechanical means
MEM08012B	Prepare surfaces by abrasive blasting (basic)

MEM08013B	Prepare surfaces by abrasive blasting (advanced)
MEM08014B	Apply protective coatings (basic)
MEM08015B	Apply protective coatings (advanced)
MEM08016B	Control blast coating by-products, materials and emissions
MEM11001C	Erect/dismantle scaffolding and equipment
MEM11002C	Erect/dismantle complex scaffolding and equipment
MEM11003B	Coordinate erection/dismantling of complex scaffolding/equipment
MEM11004B	Undertake dogging
MEM11010B	Operate mobile load shifting equipment
MEM11011B	Undertake manual handling
MEM11012B	Purchase materials
MEM11016B	Order materials
MEM11021B	Perform advanced operation of load shifting equipment
MEM11022B	Operate fixed/moveable load shifting equipment
MEM12001B	Use comparison and basic measuring devices
MEM13001B	Perform emergency first aid
MEM15002A	Apply quality systems
MEM15024A	Apply quality procedures
MEM16002C	Conduct formal interviews and negotiations
MEM16011A	Communicate with individuals and small groups
MEM16013A	Operate in a self directed team
MEM17001B	Assist in the development and delivery of training in the workplace
MEM17003A	Assist in the provision of on the job training
MNMG237A	Work safely at heights
PMBPROD241C	Lay up rubber lining or lag pulleys

PMBPROD242A	Bond polymers to surfaces
PMBPROD248C	Prepare surfaces for coating
PMBPROD265C	Operate portable vulcanising equipment
PMBPROD323C	Produce powder coated products
PMBPROD375B	Vulcanise products using an autoclave

Version 6

Refer to summary mapping for details of changes to MSA07 and Recreational Vehicle qualifications and units of competency.

Version 7

Addition of two new qualifications:

- MSA40311 Certificate IV in Process Manufacturing
- MSA50311 Diploma of Production Management

Inclusion of 51 additional imported units.

Version 8

Two new units of competency

Unit code	Unit title
MSABLIC001	License to operate a standard boiler
MSABLIC002	License to operate an advanced boiler

Introduction to the Industry

The manufacturing industry

The manufacturing industry's contribution to Australia's gross domestic product (GDP) has been falling in percentage terms since the early 1960s as other industries have risen in prominence. Despite this it is still the second largest segment of the Australian economy. In 2005–06, the industry had a gross industry product of $96 billion, exports of $75 billion and employed 1,052,000 persons. Manufacturing is a major contributor to the state economies of South Australia, Victoria, Tasmania and New South Wales.

The scope of 'manufacturing' occupations covers a broad spectrum. The skills profile of the manufacturing industry covers production workers, tradespeople, technicians and associate professionals as well as professionals. These are applied in the range of manufacturing from simply transformed to elaborately transformed materials.

Qualification Framework

The Australian Qualifications Framework

What is the Australian Qualifications Framework?
A brief overview of the Australian Qualifications Framework (AQF) follows. For a full explanation of the AQF, see the *AQF Implementation Handbook*.
http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf
The AQF provides a comprehensive, nationally consistent framework for all qualifications in post-compulsory education and training in Australia. In the vocational education and training (VET) sector it assists national consistency for all trainees, learners, employers and providers by enabling national recognition of qualifications and Statements of Attainment.
Training Package qualifications in the VET sector must comply with the titles and guidelines of the AQF. Endorsed Training Packages provide a unique title for each AQF qualification which must always be reproduced accurately.
Qualifications
Training Packages can incorporate the following eight AQF qualifications.

- Certificate I in ...
- Certificate II in ...
- Certificate III in ...
- Certificate IV in ...
- Diploma of ...
- Advanced Diploma of ...
- Vocational Graduate Certificate of ...
- Vocational Graduate Diploma of ...

On completion of the requirements defined in the Training Package, a Registered Training Organisation (RTO) may issue a nationally recognised AQF qualification. Issuance of AQF qualifications must comply with the advice provided in the *AQF Implementation Handbook* and the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.
Statement of Attainment

A Statement of Attainment is issued by a Registered Training Organisation when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). Issuance of Statements of Attainment must comply with the advice provided in the current *AQF Implementation Handbook* and the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Under the AQTF 2010, RTOs must recognise the achievement of competencies as recorded on a qualification or Statement of Attainment issued by other RTOs. Given this, recognised competencies can progressively build towards a full AQF qualification.

AQF Guidelines and Learning Outcomes

The *AQF Implementation Handbook* provides a comprehensive guideline for each AQF qualification. A summary of the learning outcome characteristics and their distinguishing features for each VET related AQF qualification is provided below.

Certificate I

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform a defined range of activities most of which may be routine and predictable.

Applications may include a variety of employment related skills including preparatory access and participation skills, broad-based induction skills and/or specific workplace skills. They may also include participation in a team or work group.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate knowledge by recall in a narrow range of areas;
- demonstrate basic practical skills, such as the use of relevant tools;
- perform a sequence of routine tasks given clear direction

receive and pass on messages/information.

Certificate II

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and skills would prepare a person to perform in a range of varied activities or knowledge application where there is a clearly defined range of contexts in which the choice of actions required is usually clear and there is limited complexity in the range of operations to be applied.

Performance of a prescribed range of functions involving known routines and procedures and some accountability for the quality of outcomes.

Applications may include some complex or non-routine activities involving individual responsibility or autonomy and/or collaboration with others as part of a group or team.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate basic operational knowledge in a moderate range of areas;
- apply a defined range of skills;
- apply known solutions to a limited range of predictable problems;
- perform a range of tasks where choice between a limited range of options is required;
- assess and record information from varied sources;

take limited responsibility for own outputs in work and learning.

Certificate III

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover selecting, adapting and transferring skills and knowledge to new environments and providing technical advice and some leadership in resolution of specified problems. This would be applied across a range of roles in a variety of contexts with some complexity in the extent and choice of options available.

Performance of a defined range of skilled operations, usually within a range of broader related activities involving known routines, methods and procedures, where some discretion and judgement is required in the section of equipment, services or contingency measures and within known time constraints.

Applications may involve some responsibility for others. Participation in teams including group or team co-ordination may be involved.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate some relevant theoretical knowledge
- apply a range of well-developed skills
- apply known solutions to a variety of predictable problems
- perform processes that require a range of well-developed skills where some discretion and judgement is required
- interpret available information, using discretion and judgement
- take responsibility for own outputs in work and learning

take limited responsibility for the output of others.

Certificate IV

Characteristics of Learning Outcomes

Breadth, depth and complexity of knowledge and competencies would cover a broad range of varied activities or application in a wider variety of contexts most of which are complex and non-routine. Leadership and guidance are involved when organising activities of self and others as well as contributing to technical solutions of a non-routine or contingency nature.

Performance of a broad range of skilled applications including the requirement to evaluate and analyse current practices, develop new criteria and procedures for performing current practices and provision of some leadership and guidance to others in the application and planning of the skills. Applications involve responsibility for, and limited organisation of, others.

Distinguishing Features of Learning Outcomes

Do the competencies enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating some theoretical concepts
- apply solutions to a defined range of unpredictable problems
- identify and apply skill and knowledge areas to a wide variety of contexts, with depth in some areas
- identify, analyse and evaluate information from a variety of sources
- take responsibility for own outputs in relation to specified quality standards

take limited responsibility for the quantity and quality of the output of others.

Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity covering planning and initiation of alternative approaches to skills or knowledge applications across a broad range of technical and/or management requirements, evaluation and co-ordination.

The self directed application of knowledge and skills, with substantial depth in some areas where judgment is required in planning and selecting appropriate equipment, services and techniques for self and others.

Applications involve participation in development of strategic initiatives as well as personal responsibility and autonomy in performing complex technical operations or organising others. It may include participation in teams including teams concerned with planning and evaluation functions. Group or team co-ordination may be involved.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of a broad knowledge base incorporating theoretical concepts, with substantial depth in some areas
- analyse and plan approaches to technical problems or management requirements
- transfer and apply theoretical concepts and/or technical or creative skills to a range of situations
- evaluate information, using it to forecast for planning or research purposes
- take responsibility for own outputs in relation to broad quantity and quality parameters

take some responsibility for the achievement of group outcomes.

Advanced Diploma

Characteristics of Learning Outcomes

Breadth, depth and complexity involving analysis, design, planning, execution and evaluation across a range of technical and/or management functions including development of new criteria or applications or knowledge or procedures.

The application of a significant range of fundamental principles and complex techniques across a wide and often unpredictable variety of contexts in relation to either varied or highly specific functions. Contribution to the development of a broad plan, budget or strategy is involved and accountability and responsibility for self and others in achieving the outcomes is involved.

Applications involve significant judgement in planning, design, technical or leadership/guidance functions related to products, services, operations or procedures.

The degree of emphasis on breadth as against depth of knowledge and skills may vary between qualifications granted at this level.

Distinguishing Features of Learning Outcomes

Do the competencies or learning outcomes enable an individual with this qualification to:

- demonstrate understanding of specialised knowledge with depth in some areas
- analyse, diagnose, design and execute judgements across a broad range of technical or management functions
- generate ideas through the analysis of information and concepts at an abstract level

- demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills
- demonstrate accountability for personal outputs within broad parameters

demonstrate accountability for personal and group outcomes within broad parameters.

Vocational Graduate Certificate

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth and complexity involving the initiation, analysis, design, planning, execution and evaluation of technical and management functions in highly varied and highly specialised contexts.
- Applications involve making significant, high-level, independent judgements in major broad or planning, design, operational, technical and management functions in highly varied and specialised contexts. They may include responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major broad or technical and management functions in highly varied and highly specialised contexts.
- Generate and evaluate ideas through the analysis of information and concepts at an abstract level.
- Demonstrate a command of wide-ranging, highly specialised technical, creative or conceptual skills in complex contexts.
- Demonstrate responsibility and broad-ranging accountability for the structure, management and output of the work or functions of others.

Vocational Graduate Diploma

Characteristics of competencies or learning outcomes

- The self-directed development and achievement of broad and specialised areas of knowledge and skills, building on prior knowledge and skills.
- Substantial breadth, depth and complexity involving the initiation, analysis, design, planning, execution and evaluation of major functions, both broad and highly specialised, in highly varied and highly specialised contexts.
- Further specialisation within a systematic and coherent body of knowledge.
- Applications involve making high-level, fully independent, complex judgements in broad planning, design, operational, technical and management functions in highly varied and highly specialised contexts. They may include full responsibility and accountability for all aspects of work and functions of others, including planning, budgeting and strategy development.
- The degree of emphasis on breadth, as opposed to depth, of knowledge and skills may vary between qualifications granted at this level.

Distinguishing features of learning outcomes

- Demonstrate the self-directed development and achievement of broad and highly specialised areas of knowledge and skills, building on prior knowledge and skills.
- Initiate, analyse, design, plan, execute and evaluate major functions, both broad and within highly varied and highly specialised contexts.
- Generate and evaluate complex ideas through the analysis of information and concepts at an abstract level.
- Demonstrate an expert command of wide-ranging, highly specialised, technical, creative or conceptual skills in complex and highly specialised or varied contexts.
- Demonstrate full responsibility and accountability for personal outputs.
- Demonstrate full responsibility and accountability for all aspects of the work or functions of others, including planning, budgeting and strategy.
-

Qualification Pathways

Qualifications in MSA07

The new Manufacturing Training Package was initially developed to include all qualifications across the manufacturing industries as the existing manufacturing Training Packages are rationalised. Information on some of the qualifications available in MSA07 follows.

Pathways qualifications

MSA10107 Certificate I in Manufacturing (Pathways)

The Certificate I in Manufacturing (Pathways) is a cross-manufacturing certificate, utilising elective units from a range of MSA Training Packages. The packaging rules for MSA10107 are based on the agreed Pathways qualification model:

- three core Pathways units
- one industry/technical unit* to be chosen from a bank of units imported from MCM04
- balance of units from a bank of elective units imported from other MSA Training Packages.

*Note that the industry/technical units coded "MSAPII" are designed for use only in a Pathways qualification or skills set. They should not be used in other qualifications as replacements for units that have direct job outcomes.

There is significant support from a range of manufacturing industries for the Pathways Certificate I.   The certificate has been reviewed and approved by MSA's industry advisory committees, whose members represent:

- textiles, clothing, footwear and furniture
- process manufacturing
- metal and engineering.

The Certificate I in Manufacturing (Pathways) provides a generic, cross manufacturing Certificate I designed to:

- develop both employability and technical skills
- allow for selection of competency standards from a range of manufacturing Training Packages
- encourage collaborative delivery and assessment approaches\
- map to existing qualifications
- include opportunities for recognition against existing qualifications
- provide a clear pathway into other Training Package qualifications and/or employment.

The Pathways Certificate I also responds to the need to:

- provide pathways for those whom access to formal vocational education and training has been limited
- ensure consistency with existing Certificate I qualifications
- ensure that employment related solutions are encouraged throughout the structure of the qualifications and that guideline materials provided are in alignment with licensing boundaries
- make employability and generic skills 'front and centre' in the development of qualifications
- provide opportunities for new pedagogical approaches and for local input.

It is expected that as manufacturing Training Packages are reviewed and/or updated, this certificate will replace a number of existing Certificates I.

MSA20208 Certificate II in Manufacturing Technology

This qualification was developed and endorsed in the Competitive Manufacturing Training Package. It applies to a learning and assessment environment where access to normal production operations is not available. A typical environment will be for application in a VET in Schools program or other simulated or trial manufacturing environment where a high degree of supervision exists. The units are suitable for delivery in a school environment and for schools to contextualize the units to local manufacturing industry activities.

Process Manufacturing qualifications

Process Manufacturing Certificates I, II, III and IV

The three Process Manufacturing Certificates (or production support certificates) cater for people working in the manufacturing industry and filling vital production support roles, but who may not have the opportunity to develop competence in sufficient technical units of competency related directly to producing products.

These certificates have been developed for inclusion in the Manufacturing Training Package

(MSA07) as common certificates for use across the three process manufacturing Training Packages:

- Chemical, Hydrocarbons and Oil Refining Training Package (PMA)
- Plastics, Rubber and Cablemaking Training Package (PMB)
- Manufactured Mineral Products Training Package (PMC).

The packaging rules for these certificates allow for the importation of electives from PMA, PMB and PMC. Registered Training Organisations should refer to Training.gov.au (www.training.gov.au) to access units of competency from these packages.

Production Management qualifications

Production Management Diploma

The Diploma of Production Management was developed to provide the skills needed to assist organisations improve production where competitive manufacturing (lean) processes are not fully employed. It therefore complements but does not duplicate qualifications supplying skills related to competitive manufacturing.

The qualification supplies the skills that can be applied to the design and control of production systems within an organisation, including:

- planning and scheduling
- tracking and analysing
- directing and operating.

Competitive Manufacturing qualifications

General Comments

The Competitive Manufacturing qualifications were developed as a collaborative response from Australia's manufacturing Industry Advisory Bodies to assist manufacturing industry improve manufacturing practice through the development of innovative vocational education and training (VET) qualifications and units of competency. Full details on this development are in the Appendices to MSA07.

As the Competitive Manufacturing qualifications complement manufacturing Training Packages, provision is made in the qualifications for the importation of relevant sector specific units of competency into CM qualifications. It is also expected that CM units of competency will be imported into existing manufacturing Training Packages when they are reviewed, or under continuous improvement provisions. Not all CM units of competency may be appropriate for any given sector.

Due to the nature of CM, it is expected that most delivery and assessment will be done in partnership with an enterprise, or group of enterprises, which are embarking on competitive manufacturing. A project style of delivery is envisaged for many units of competency.

It may be appropriate to grant recognition of prior learning (RPL) for certain FMI units depending on the amount and type of contextualisation applied to the FMI unit. As the equivalence will depend on the contextualisation applied, it is not possible to give general advice at this stage.

Companies embarking on competitive/lean manufacturing will frequently choose different starting points, and often different names to describe what they are doing. This Training Package allows for these differences in approach and relevant units of competency should be selected to match the starting point and the strategies being adopted.

Where sector specific competencies are required, these should be imported from the relevant sector specific Training Package. Relevant units at the same level or at an AQF level one up or one below the selected CM qualification should be chosen.

Using the CM units

The CM units have been written with the intention that they be used in a number of contexts.
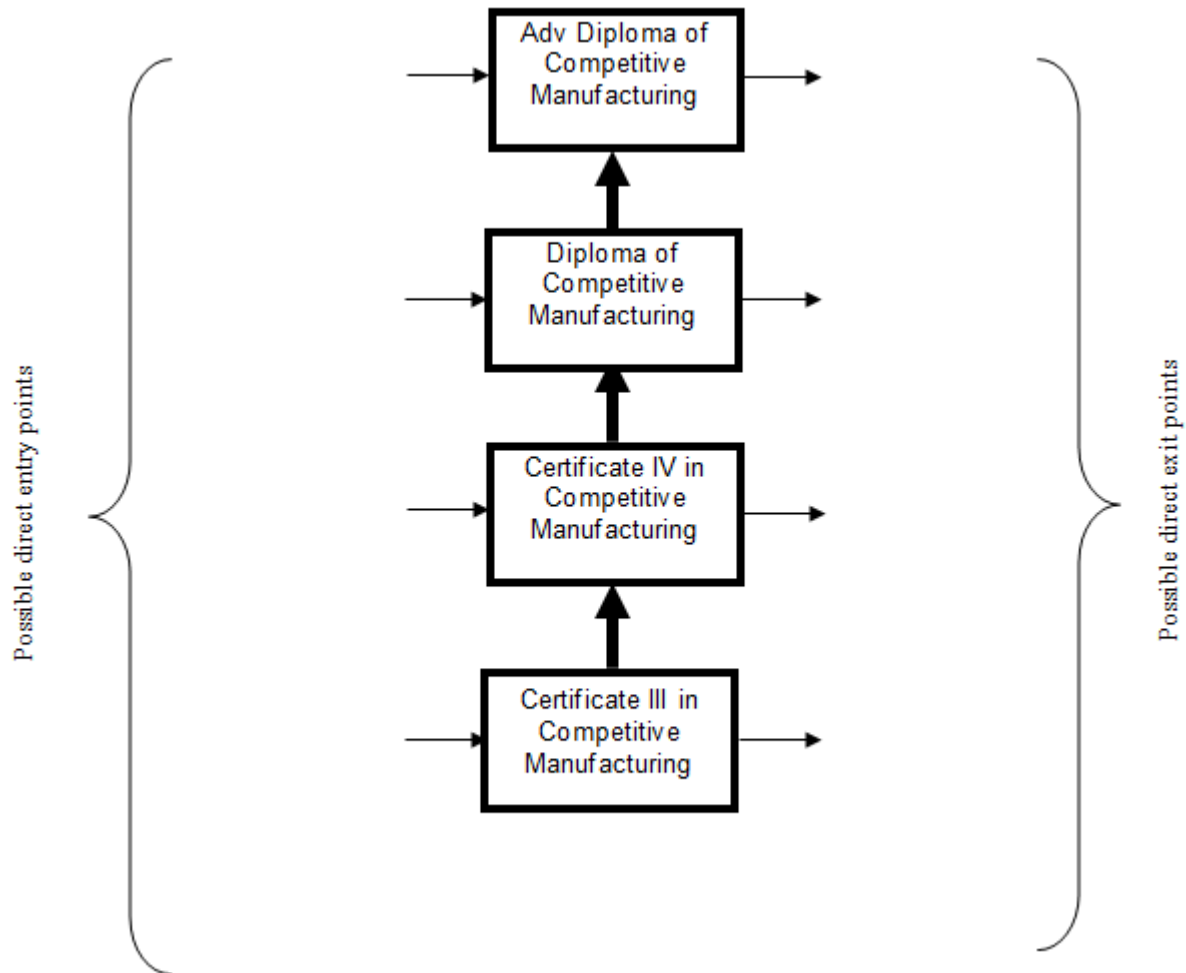
The units have been packaged into specific Competitive Manufacturing qualifications. These are appropriate for individuals and enterprises where the need for generic manufacturing practice skills is dominant over the need for specific technical skills. The requirements for Competitive Manufacturing qualifications are detailed in the packaging rules for each qualification.

The units are also intended to be imported into sector specific Training Packages and qualifications. This would be appropriate where the need for sector specific and/or technical skills is dominant, but there is also a need for generic manufacturing practice skills. The requirements for these sector specific qualifications will be contained in their respective Training Packages and Qualifications Frameworks.

It is expected that many personnel in manufacturing will have some need of the manufacturing practice skills defined by the Competitive Manufacturing units of competency. Their importation into manufacturing Training Packages is encouraged. Imported units should show the original code number and unit title.

Qualification Pathways for Competitive Manufacturing – AQF II to VI

The diagram below represents a model of the available qualifications and pathways. Details are in the packaging rules for each qualification. Contact Manufacturing Skills Australia {www.mskills.com.au} for further details.

```
                              ┌──────────────┐
                              │ Adv Diploma of│
                           →  │  Competitive  │ →
                              │ Manufacturing │
                              └──────────────┘
                                     ↑
                              ┌──────────────┐
                              │  Diploma of   │
                           →  │  Competitive  │ →
                              │ Manufacturing │
                              └──────────────┘
                                     ↑
                              ┌──────────────┐
                              │ Certificate IV in│
                           →  │  Competitive  │ →
                              │ Manufacturing │
                              └──────────────┘
                                     ↑
                              ┌──────────────┐
                              │Certificate III in│
                           →  │  Competitive  │ →
                              │ Manufacturing │
                              └──────────────┘
```

Possible direct entry points   Possible direct exit points

Competitive Manufacturing Vocational Graduate qualifications

The addition of these new qualifications will enable a professional development pathway to be offered for individuals who have prior experience or training in competitive manufacturing.

Industry priorities addressed in the new Vocational Graduate qualifications are to provide additional development of skills and knowledge in competitive manufacturing practices for individuals who have prior training or industry experience in competitive manufacturing. This need for additional skill is usually apparent after an enterprise has completed initial implementation of a competitive manufacturing system such as lean manufacturing and needs to progress implantation of the system to a higher level of performance beyond that achieved from the initial implementation.

Development of the Vocational Graduate Competitive Manufacturing qualifications is also a response to industry advice that not all needs for increased competency in competitive manufacturing skills is related to promotion of an individual to a position of increased responsibility. As stated in the previous paragraph the demand for increased skill and

knowledge can also be related to the stage of an enterprise's implementation of a competitive manufacturing system

The Vocational Graduate Competitive Manufacturing qualifications also meet the industry need for in depth competitive manufacturing training in skills associated with establishing workforce understanding and participation in competitive manufacturing and for advanced value chain skills.

The new Vocational Graduate Competitive Manufacturing qualifications now offer a choice of two levels of professional development for individuals seeking to extend their knowledge of and skills in competitive manufacturing systems. Unlike the existing endorsed AQF II – VI Competitive Manufacturing qualifications they do not have assumptions that the candidate will be working at a particular level in industry (e.g. supervisor or manager). For this reason they are likely to be seen as ideal training for change agents and other expert resource people in competitive manufacturing as well as offering further skill development to any one with previous competitive manufacturing training or experience.

Consultations also indicated that the project based nature of many of the units and the lower but more intense nature of the qualifications may attract more senior and experienced personnel to the qualifications compared to the existing Diploma and Advanced Diploma of Competitive Manufacturing which are designed as high level entry level qualifications to competitive manufacturing.

Manufacturing Technology Qualifications

In August 2003 the Australian Industry Group with funding assistance from ANTA established a Manufacturing Technician Training Initiative project known colloquially as the Technology Cadetship Project. The aim of the project was to develop and promote more efficient pathways for school leavers to enter technical occupations in manufacturing industry. One of the key objectives was to establish entry level qualifications linked to on and off the job training in a cadetship arrangement. The term Technology Cadetship was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships although the principle of combined off and on the training and mutual obligation of employer and employee is the same.

General Advice – Technology Cadetship arrangements

These qualifications may be delivered as part of a cadetship contract of training often called a Technology Cadetship. The units listed for all these qualifications are taken from a number of existing Training Packages. These units have been examined for suitability in a cadetship environment and repackaged to suit entry level technology based training in manufacturing.

Structure of Technology Cadetships

The Technology Cadetship related qualifications are very flexible qualifications with a minimum number of core units and specialisations that maximise flexibility. The electives have been chosen to give entry and operational skills in a wide range of manufacturing technology application areas. Each qualification consists of specialist options. Each stream indicates the units that may be taken in that particular specialisation. It is intended at a later date to add additional units and streams to the qualifications.

Manufacturing Technology specialist streams

The streams available in the Manufacturing Technology qualifications offer a significant choice of electives. In MSA07v3.1, the streams available are:

Certificate III in Manufacturing Technology

- CAD/Drafting
- Manufacturing Operations
- Laboratory Operations
- Technical Officer
- Polymer Technology
- Metallurgy
- Structural Steel Detailing

Certificate IV in Manufacturing Technology

- CAD/Drafting
- Manufacturing Operations
- Laboratory Operations
- Technical Officer
- Polymer Technology

Diploma and Advanced Diplomas of Manufacturing Technology

- Polymer Technology
- Metallurgy
- Structural Steel Detailing

Reference to these specialisations may be included on any qualification statement that is issued. This could be achieved by adding the pathway descriptor below the formal title of the qualification as shown in example 1 or by an additional sentence as shown in example 2 below.

Example 1

Certificate III in Manufacturing Technology

Manufacturing Operations

Example 2

## Certificate III in Manufacturing Technology

Achieved through the Manufacturing Operations specialisation

It should also be noted that a person holding the Metal and Engineering Training Package Certificate III in Engineering – Technician will satisfy all of the requirements for a Certificate III in Manufacturing Technology, and with an additional five units of competency from the particular stream chosen will satisfy the requirements for a Certificate IV in Manufacturing Technology.

Qualification Pathways for Manufacturing Technology

The diagram below represents a model of the qualifications and pathways. Details are in the packaging rules for each qualification. Contact Manufacturing Skills Australia {www.mskills.com.au} for further details.

The polymer technology pathway is intended for people who plan to become polymer technicians, and who are not currently working as operators in the polymer industries. It is recommended that those who have already achieved a Certificate II from the Plastics, Rubber and Cablemaking Training Package would be better served by completing the Certificate III in Polymer Processing.
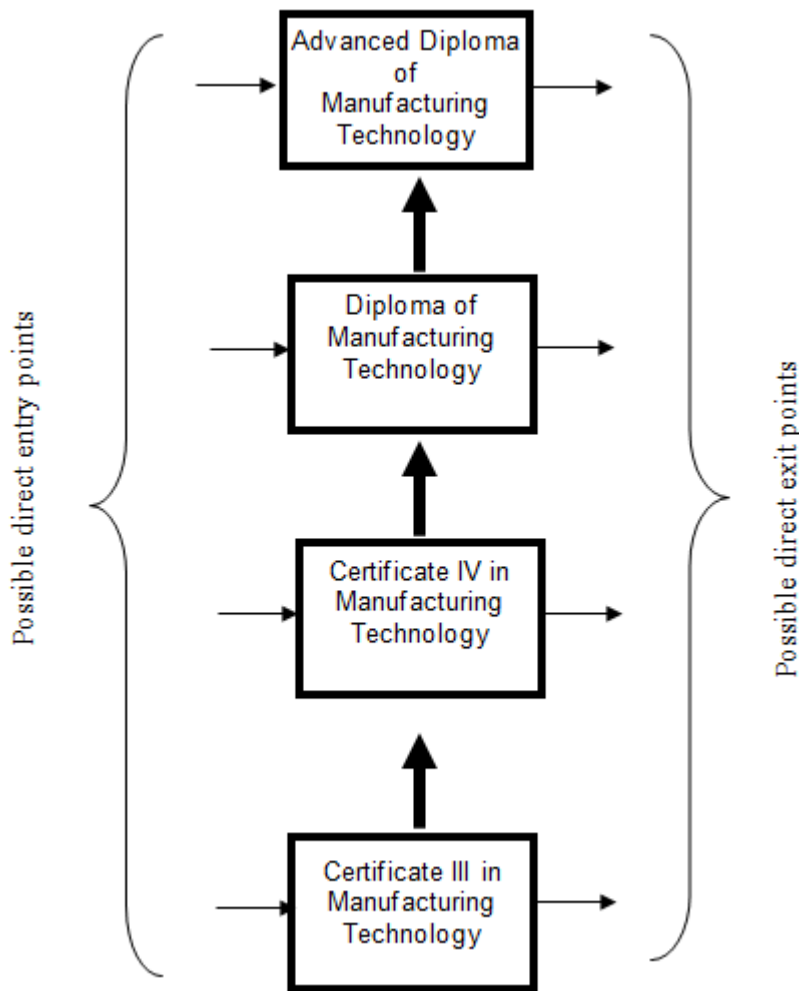
Apprenticeships

The Process Manufacturing and Competitive Manufacturing qualifications within this Training Package are potential New Apprenticeships. However these qualifications have been developed primarily for existing manufacturing workers, especially those working as or likely to become team leaders. For this reason existing worker New Apprenticeships may be more appropriate than application to school leavers.

VET in Schools

The delivery and assessment of competencies aligned to AQF 2 under this Training Package in appropriately designed VET in schools programs is encouraged. However, due to the requirements to demonstrate competency, it would be difficult for a school to assess and award the Competitive Manufacturing qualifications except in close partnership with an appropriate organisation from the industry. The AQTF rules are the overriding requirements in this regard.

The Certificate II in Manufacturing Technology has been developed specifically for use as a

VET in schools program.

Prerequisites

Some units of competency have stated prerequisites (these have been kept to a minimum). In any approved training scheme, it is expected that competency will be attained in the prerequisite units before it is attained in the unit having the prerequisites. Imported units of competency may also have prerequisites which should be observed. In this situation a unit with two prerequisites will be counted as three units towards the qualification once competency has been attained in all units.

In an assessment of existing competency, it is possible to assess the unit and its prerequisites together as an integrated assessment. In this situation as well, a unit with two prerequisites will be counted as three units towards the qualification once competency has been attained in all units.

Note that the achievement of prerequisite competencies will be recognised for the award of the qualification, regardless of the method by which the participant has gained the competencies (e.g. prior learning and/or experience). A person entering at AQF 3 and proceeding through the qualifications in an orderly manner might be expected to be assessed on the prerequisites. A person entering at a higher AQF level might expect to be able to demonstrate their competence in the prerequisite in any of a number of ways, including an assessment integrated with the higher unit. RTOs developing formal learning pathways may find the prerequisite trail useful in designing a hierarchical learning program, or they may choose to integrate the prerequisite unit into the higher level unit for purposes of delivery and assessment, or some other approach.

Skill Sets in this Training Package

Definition

Skill sets are defined as single units of competency, or combinations of units of competency from an endorsed Training Package, which link to a licence or regulatory requirement, or defined industry need.

Wording on Statements of Attainment

Skill sets are a way of publicly identifying logical groupings of units of competency which meet an identified need or industry outcome. Skill sets are not qualifications.

Where skill sets are identified in a Training Package, the Statement of Attainment can set out the competencies a person has achieved in a way that is consistent and clear for employers and others. This is done by including the wording "these competencies meet [insert skill set title or identified industry area] need" on the Statement of Attainment. This wording applies only to skill sets that are formally identified as such in the endorsed Training Package. See the 2010 edition of the AQF Implementation Handbook for advice on wording on Statements of Attainment. http://www.aqf.edu.au/Portals/0/Documents/Handbook/AQF_Handbook_07.pdf

Manufacturing Skill Sets

Industry has supported the creation of a range of Skill Sets to assist with meeting the competency needs of a developing sector.

Some job roles in some sectors of the industry do require a licence, however, there is no overall industry requirement for this and so no Skill Set associated with licensing has been developed. The industry manages the competency requirements of its workforce to ensure compliance with a vast web of regulatory requirements.

The Skill Sets in MSA07 have been developed in consultation with the industry and are based on logical clusters of units which meet critical industry needs. These Skill Sets consist of clusters of competencies which are commonly practiced together. They reflect an industry need to be able to recognise that a person can undertake these defined roles.

Trade Measurement Skill Sets

Responsibility for trade measurement matters will transfer to the Commonwealth on 1 July, 2010. The National Measurement Institute (NMI) has the responsibility of administering the national trade measurement legislation which encourages and promotes accurate measurement in the sale of goods.

Currently, there are approximately 100 trade measurement inspectors who undertake trade measurement activities that can be categorised into five distinct work functions including:

- instrument verification
- pre-packaged products
- trading practices
- licensing
- investigations.

In addition to the inspectors, there are approximately 2000 verifiers who work under a servicing licence to verify measuring instruments and measures used in trade measurement. The principal occupations of verifiers are fitters, mechanics, quality assurance technicians, instrument manufacturers or importers and software developers. Verification of measuring instruments only represents about 10% of their core functions and they spend the majority (90%) of their time repairing, commissioning, manufacturing or selling measuring instruments. Verification involves testing instruments using National Test Procedures to ensure they consistently measure within requirements. Instruments that pass these tests are marked to indicate they are suitable for trade use.

Trade measuring instruments vary greatly in design and complexity. Examples include, shop scales, petrol pumps, weighbridges, machines for measuring length, LPG bulk flowmetering systems, rail weighbridges, high flow rate fuel measuring systems and belt weighers. To address this diversity, the industry and the National Measurement Institute have supported the development of five (5) Skill Sets for Trade Measurement Verification. These are:

- Trade Measurement Verification (Simple Measure)
- Trade Measurement Verification (Simple Measuring Instrument)
- Trade Measurement Verification (Limited Weighing Instrument)
- Trade Measurement Verification (Liquid Measuring Instrument Using Volume Measures)
- Trade Measurement Verification (Complex Measuring Instrument).

Each Skill Set consists of two (2) units that cover the competency requirements of conducting verification tests for the specific class of trade measuring instrument listed in the title.
From 2010, verifiers will need to achieve the relevant Skill Set before being eligible to work as a verifier under a trade measurement servicing licence.

- Skill Set: Trade Measurement Verification (Simple Measure)
- Skill Set: Trade Measurement Verification (Simple Measuring Instrument)
- Skill Set: Trade Measurement Verification (Limited Weighing Instrument)
- Skill Set: Trade Measurement Verification (Liquid Measuring Instrument Using Volume Measures)
- Skill Set: Trade Measurement Verification (Complex Measuring Instrument)

High Pressure Water Jetting Skill Sets

Industry has supported the creation of a range of Skill Sets to assist with meeting the competency needs of a developing sector.

Some job roles in some sectors of the industry do require a licence, however, there is no overall industry requirement for this and so no Skill Set associated with licensing has been developed. The industry manages the competency requirements of its workforce to ensure compliance with a vast web of regulatory requirements. The Skill Sets below have been developed in consultation with the industry and are based on logical clusters of units which meet critical industry needs.
These Skill Sets consist of clusters of competencies which are commonly practiced together. They reflect an industry-wide need to be able to recognise that a person can undertake these defined roles.

- Skill Set: High pressure water jetting operator
- Skill Set: High pressure water jetting assistant
- Skill Set: Confined space work team

Boiler operations Skill Sets

Two Skill Sets have been developed for boiler licensing:

- Licence to operate a standard boiler
- Licence to operate an advanced boiler

Employability Skills

Employability Skills replacing Key Competency information from 2006

In May 2005, the approach to incorporate Employability Skills within Training Package qualifications and units of competency was endorsed. As a result, from 2006 Employability Skills will progressively replace Key Competency information in Training Packages.

Background to Employability Skills

Employability Skills are also sometimes referred to as generic skills, capabilities or Key Competencies. The Employability Skills discussed here build on the Mayer Committee's Key Competencies, which were developed in 1992 and attempted to describe generic competencies for effective participation in work.

The Business Council of Australia (BCA) and the Australian Chamber of Commerce and Industry (ACCI), produced the *Employability Skills for the Future* report in 2002 in consultation with other peak employer bodies and with funding provided by the Department of Education, Science and Training (DEST) and the Australian National Training Authority (ANTA). Officially released by Dr Nelson (Minister for Education, Science and Training) on 23 May 2002, copies of the report are available from the DEST website at: http://www.dest.gov.au/archive/ty/publications/employability_skills/index.htm.

The report indicated that business and industry now require a broader range of skills than the Mayer Key Competencies Framework and featured an Employability Skills Framework identifying eight Employability Skills*:

- communication
- teamwork
- problem solving
- initiative and enterprise
- planning and organising
- self-management
- learning
- technology.

The report demonstrated how Employability Skills can be further described for particular occupational and industry contexts by sets of facets. The facets listed in the report are the aspects of the Employability Skills that the sample of employers surveyed identified as being important work skills. These facets were seen by employers as being dependent both in their nature and priority on an enterprise's business activity.

*   Personal attributes that contribute to employability were also identified in the report but are not part of the Employability Skills Framework.

Employability Skills Framework

The following table contains the Employability Skills facets identified in the report *Employability Skills for the Future*.

Skill	Facets
	Aspects of the skill that employers identify as important. The nature and application of these facets will vary depending on industry and job type.

Communication that contributes to productive and harmonious relations across employees and customers	- listening and understanding - speaking clearly and directly - writing to the needs of the audience - negotiating responsively - reading independently - empathising - using numeracy effectively - understanding the needs of internal and external customers - persuading effectively - establishing and using networks - being assertive - sharing information - speaking and writing in languages other than English
Teamwork that contributes to productive working relationships and outcomes	- working across different ages irrespective of gender, race, religion or political persuasion - working as an individual and as a member of a team - knowing how to define a role as part of the team - applying teamwork to a range of situations e.g. futures planning and crisis problem solving - identifying the strengths of team members - coaching and mentoring skills, including giving feedback
Problem solving that contributes to productive outcomes	- developing creative, innovative and practical solutions - showing independence and initiative in identifying and solving problems - solving problems in teams - applying a range of strategies to problem solving - using mathematics, including budgeting and financial management to solve problems - applying problem-solving strategies across a range of areas - testing assumptions, taking into account the context of data and circumstances - resolving customer concerns in relation to complex project issues
Initiative and enterprise that contribute	adapting to new situations

to innovative outcomes	• developing a strategic, creative and long-term vision • being creative • identifying opportunities not obvious to others • translating ideas into action • generating a range of options • initiating innovative solutions
Planning and organising that contribute to long and short-term strategic planning	• managing time and priorities - setting time lines, coordinating tasks for self and with others • being resourceful • taking initiative and making decisions • adapting resource allocations to cope with contingencies • establishing clear project goals and deliverables • allocating people and other resources to tasks • planning the use of resources, including time management • participating in continuous improvement and planning processes • developing a vision and a proactive plan to accompany it
	• predicting - weighing up risk, evaluating alternatives and applying evaluation criteria • collecting, analysing and organising information • understanding basic business systems and their relationships
Self-management that contributes to employee satisfaction and growth	• having a personal vision and goals • evaluating and monitoring own performance • having knowledge and confidence in own ideas and visions • articulating own ideas and visions • taking responsibility
Learning that contributes to ongoing improvement and expansion in employee and company operations and outcomes	• managing own learning • contributing to the learning community at the workplace • using a range of mediums to learn - mentoring, peer support and networking, IT and courses • applying learning to technical issues (e.g. learning about products) and people issues

	(e.g. interpersonal and cultural aspects of work) • having enthusiasm for ongoing learning • being willing to learn in any setting - on and off the job • being open to new ideas and techniques • being prepared to invest time and effort in learning new skills • acknowledging the need to learn in order to accommodate change
Technology that contributes to the effective carrying out of tasks	• having a range of basic IT skills • applying IT as a management tool • using IT to organise data • being willing to learn new IT skills • having the OHS knowledge to apply technology • having the appropriate physical capacity

Employability Skills Summary

An Employability Skills Summary exists for each qualification. Summaries provide a lens through which to view Employability Skills at the qualification level and capture the key aspects or facets of the Employability Skills that are important to the job roles covered by the qualification. Summaries are designed to assist trainers and assessors to identify and include important industry application of Employability Skills in learning and assessment strategies. The following is important information for trainers and assessors about Employability Skills Summaries.

- Employability Skills Summaries provide examples of how each skill is applicable to the job roles covered by the qualification.
- Employability Skills Summaries contain general information about industry context which is further explained as measurable outcomes of performance in the units of competency in each qualification.
- The detail in each Employability Skills Summary will vary depending on the range of job roles covered by the qualification in question.
- Employability Skills Summaries are not exhaustive lists of qualification requirements or checklists of performance (which are separate assessment tools that should be designed by trainers and assessors after analysis at the unit level).
- Employability Skills Summaries contain information that may also assist in building learners' understanding of industry and workplace expectations.

Industry Requirements for Employability Skills

This is a technology based industry and a key role of manufacturing personnel is the solving of problems. They are expected to operate in both permanent and *ad hoc* teams as required. The communication of key safety, health, environmental and procedural/operational information to other personnel is a vital requirement.

Assessment Guidelines

Introduction

These Assessment Guidelines provide the endorsed framework for assessment of units of competency in this Training Package. They are designed to ensure that assessment is consistent with the *Australian Quality Training Framework (AQTF) Essential Standards for Initial and Continuing Registration*. Assessments against the units of competency in this Training Package must be carried out in accordance with these Assessment Guidelines.

Assessment System Overview

This section provides an overview of the requirements for assessment when using this Training Package, including a summary of the AQTF requirements; licensing and registration requirements; and assessment pathways.
Quality assessment underpins the credibility of the vocational education and training sector. The Assessment Guidelines of a Training Package are an important tool in supporting quality assessment.
Assessment within the National Skills Framework is the process of collecting evidence and making judgements about whether competency has been achieved to confirm whether an individual can perform to the standards expected in the workplace, as expressed in the relevant endorsed unit of competency.
Assessment must be carried out in accordance with the:

- benchmarks for assessment
-
- principles of assessment
- rules of evidence
- assessment requirements set out in the AQTF

Benchmarks for Assessment

The endorsed units of competency in this Training Package are the benchmarks for assessment. As such, they provide the basis for nationally recognised Australian Qualifications Framework (AQF) qualifications and Statements of Attainment issued by Registered Training Organisations (RTOs).

Principles of Assessment

All assessments carried out by RTOs are required to demonstrate compliance with the principles of assessment:

- validity
- reliability
- flexibility
- fairness
- sufficiency

These principles must be addressed in the:

- design, establishment and management of the assessment system for this Training Package
- development of assessment tools, and
- the conduct of assessment.

Validity

Assessment is valid when the process is sound and assesses what it claims to assess. Validity requires that:

(a)   assessment against the units of competency must cover the broad range of skills and knowledge that are essential to competent performance

(b)   assessment of knowledge and skills must be integrated with their practical application

(c)   judgement of competence must be based on sufficient evidence (that is, evidence gathered on a number of occasions and in a range of contexts using different assessment methods).   The specific evidence requirements of each unit of competency provide advice on sufficiency

Reliability

Reliability refers to the degree to which evidence presented for assessment is consistently interpreted and results in consistent assessment outcomes. Reliability requires the assessor to have the required competencies in assessment and relevant vocational competencies (or to assess in conjunction with someone who has the vocational competencies). It can only be achieved when assessors share a common interpretation of the assessment requirements of the unit(s) being assessed.

Flexibility

To be flexible, assessment should reflect the candidate's needs; provide for recognition of competencies no matter how, where or when they have been acquired; draw on a range of methods appropriate to the context, competency and the candidate; and support continuous competency development.

Fairness

Fairness in assessment requires consideration of the individual candidate's needs and characteristics, and any reasonable adjustments that need to be applied to take account of them. It requires clear communication between the assessor and the candidate to ensure that the candidate is fully informed about, understands and is able to participate in, the assessment process, and agrees that the process is appropriate. It also includes an opportunity for the person being assessed to challenge the result of the assessment and to be reassessed if necessary.

Sufficiency

Sufficiency relates to the quality and quantity of evidence assessed. It requires collection of enough *appropriate* evidence to ensure that all aspects of competency have been satisfied and that competency can be demonstrated repeatedly. Supplementary sources of evidence may be necessary. The specific evidence requirements of each unit of competency provide advice on sufficiency.   Sufficiency is also one of the rules of evidence.

Rules of Evidence

The rules of evidence guide the collection of evidence that address the principles of validity and reliability, guiding the collection of evidence to ensure that it is valid, sufficient, current and authentic.

Valid
  Valid evidence must relate directly to the requirements of the unit of competency.   In ensuring evidence is valid, assessors must ensure that the evidence collected supports demonstration of the outcomes and performance requirements of the unit of competency together with the knowledge and skills necessary for competent performance.   Valid evidence must encapsulate the breadth and depth of the unit of competency, which will necessitate using a number of different assessment methods.

Sufficient
Sufficiency relates to the quality and quantity of evidence assessed. It requires collection of enough appropriate evidence to ensure that all aspects of competency have been satisfied and that competency can be demonstrated repeatedly. Supplementary sources of evidence may be necessary. The specific evidence requirements of each unit of competency provide advice on sufficiency.

Current
In assessment, currency relates to the age of the evidence presented by a candidate to demonstrate that they are still competent. Competency requires demonstration of current performance, so the evidence collected must be from either the present or the very recent past.

Authentic
To accept evidence as authentic, an assessor must be assured that the evidence presented for assessment is the candidate's own work.

Assessment Requirements of the Australian Quality Training Framework
Assessment leading to nationally recognised AQF qualifications and Statements of Attainment in the vocational education and training sector must meet the requirements of the AQTF as expressed in the AQTF 2010 *Essential Standards for Registration.*
The AQTF 2010 *Essential Standards for Initial and Continuing Registration* can be downloaded from <www.training.com.au>.

The following points summarise the assessment requirements.

Registration of Training Organisations
Assessment must be conducted by, or on behalf of, an RTO formally registered by a State or Territory Registering Body in accordance with the AQTF. The RTO must have the specific units of competency and/or AQF qualifications on its scope of registration.
Quality Training and Assessment
Each RTO must provide quality training and assessment across all its operations. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*, Standard 1.
Assessor Competency Requirements

Each person involved in training and assessment must be competent for the functions they perform. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*, Standard 1 for assessor (and trainer) competency requirements.   See also the AQTF 2010 *Users' Guide to the Essential Standards for Registration* – Appendix 2.

Assessment Requirements

The RTOs assessments, including RPL, must meet the requirements of the relevant endorsed Training Package. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Assessment Strategies

Each RTO must have strategies for training and assessment that meet the requirements of the relevant Training Package or accredited course and are developed in consultation with industry stakeholders. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

National Recognition

Each RTO must recognise the AQF qualifications and Statements of Attainment issued by any other RTO. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*..

Access and Equity and Client Outcomes

Each RTO must adhere to the principles of access and equity and maximise outcomes for its clients. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration.*

Monitoring Assessments

Training and/or assessment provided on behalf of the RTO must be monitored to ensure that it is in accordance with all aspects of the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Recording Assessment Outcomes

Each RTO must manage records to ensure their accuracy and integrity. See the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

Issuing AQF qualifications and Statement of Attainment

Each RTO must issue AQF qualifications and Statements of Attainment that meet the requirements of the current *AQF Implementation Handbook* and the endorsed Training Packages within the scope of its registration. An AQF qualification is issued once the full requirements for a qualification, as specified in the nationally endorsed Training Package are met. A Statement of Attainment is issued when an individual has completed one or more units of competency from nationally recognised qualification(s)/courses(s). See the AQTF and the edition of the *AQF Implementation Handbook*—available on the AQF Council website <www.aqf.edu.au >

Licensing/Registration Requirements

This section provides information on licensing/registration requirements for this Training Package, with the following important disclaimer.

The developers of this Training Package consider that no licensing or registration requirements apply to RTOs, assessors or candidates with respect to this Training Package. Contact the relevant State or Territory Department(s) to check if there are any licensing or registration requirements with which you must comply. For further information on this topic contact www.mskills.com.au.

Pathways

The competencies in this Training Package may be attained in a number of ways including through:

• formal or informal education and training

- experiences in the workplace
- general life experience, and/or
- any combination of the above.

Assessment under this Training Package leading to an AQF qualification or Statement of Attainment may follow a learning and assessment pathway, or a recognition pathway, or a combination of the two as illustrated in the following diagram.

| Units of Competency | ⇨ | Learning   and Assessment Pathways ⇕ and/or ⇕ | ⇨ | Statement of Attainment and/or qualification under the Australian Qualifications Framework |
| | ⇨ | Credit Pathways (RPL and Credit Transfer) | ⇨ | |
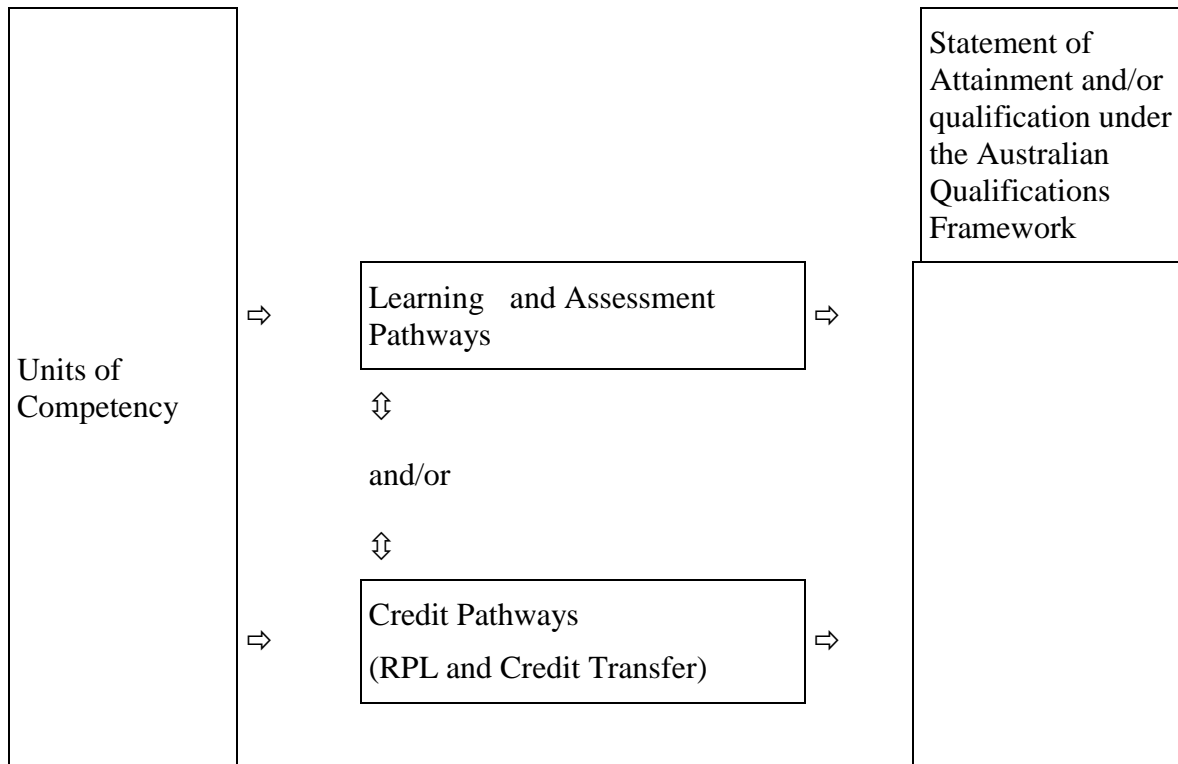
Each of these assessment pathways leads to full recognition of competencies held – the critical issue is that the candidate is competent, not how the competency was acquired. Assessment, by any pathway, must comply with the assessment requirements set out in the Assessment Guidelines of the Training Package , the AQTF and, where relevant, the Australian Qualifications Framework.

Learning and Assessment Pathways

Usually, learning and assessment are integrated, with evidence being collected and feedback provided to the candidate at anytime throughout the learning and assessment process. Learning and assessment pathways may include structured programs in a variety of contexts using a range of strategies to meet different learner needs. Structured learning and assessment programs could be: group-based, work-based, project-based, self-paced, action learning-based; conducted by distance or e-learning; and/or involve practice and experience in the workplace.

Learning and assessment pathways to suit Australian Apprenticeships have a mix of formal structured training and structured workplace experience with formative assessment activities through which candidates can acquire and demonstrate skills and knowledge from the relevant units of competency.

Credit Pathways

Credit is the value assigned for the recognition of equivalence in content between different types of learning and/or qualifications which reduces the volume of learning required to achieve a qualification.

Credit arrangements must be offered by all RTOs that offer Training Package qualifications. Each RTO must have a systematic institutional approach with clear, accessible and transparent policies and procedures.

Competencies already held by individuals can be formally assessed against the units of competency in this Training Package, and should be recognised regardless of how, when or where they were acquired, provided that the learning is relevant to the unit of competency outcomes.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is an assessment process which determines the credit outcomes of an individual application for credit.

The availability of Recognition of Prior Learning (RPL) provides all potential learners with access to credit opportunities.

The recognition of prior learning pathway is appropriate for candidates who have previously attained skills and knowledge and who, when enrolling in qualifications, seek to shorten the duration of their training and either continue or commence working.   This may include the following groups of people:

- existing workers;
- individuals with overseas qualifications;
- recent migrants with established work histories;

- people returning to the workplace; and
- people with disabilities or injuries requiring a change in career.
-

As with all assessment, RPL assessment should be undertaken by academic or teaching staff with expertise in the subject, content of skills area, as well as knowledge of and expertise in RPL assessment policies and procedures.

Assessment methods used for RPL should provide a range of ways for individuals to demonstrate that they have met the required outcomes and can be granted credit. These might include:

- questioning (oral or written)
- consideration of a portfolio and review of contents
- consideration of third party reports and/or other documentation such as documentation such as articles, reports, project material, papers, testimonials or other products prepared by the RPL applicant that relate to the learning outcomes of the relevant qualification component
- mapping of learning outcomes from prior formal or non-formal learning to the relevant qualification components
- observation of performance, and
- participation in structured assessment activities the individual would normally be required to undertake if they were enrolled in the qualification component/s.

In a Recognition of Prior Learning (RPL) pathway, the candidate provides current, quality evidence of their competency against the relevant unit of competency.   This process may be directed by the candidate and verified by the assessor. Where the outcomes of this process indicate that the candidate is competent, structured training is not required.   The RPL requirements of the AQTF must be met.

As with all assessment, the assessor must be confident that the evidence indicates that the candidate is currently competent against the endorsed unit of competency. This evidence may take a variety of forms and might include certification, references from past employers, testimonials from clients, work samples and/or observation of the candidate. The onus is on candidates to provide sufficient evidence to satisfy assessors that they currently hold the relevant competencies. In judging evidence, the assessor must ensure that the evidence of prior learning is:

- authentic (the candidate's own work);
- valid (directly related to the current version of the relevant endorsed unit of competency);
- reliable (shows that the candidate consistently meets the endorsed unit of competency);
- current (reflects the candidate's current capacity to perform the aspect of the work covered by the endorsed unit of competency); and
- sufficient (covers the full range of elements in the relevant unit of competency and addresses the four dimensions of competency, namely task skills, task management skills, contingency management skills, and job/role environment skills).

Credit Transfer
Credit transfer is a process which provides learners with agreed and consistent credit outcomes based on equivalences in content between matched qualifications.

This process involves education institutions:

- mapping, comparing and evaluating the extent to which the defined *learning outcomes and assessment requirements* of the individual *components of one qualification* are equivalent to the learning outcomes and assessment requirements of the individual components of another qualification
- making an educational judgment of the credit outcomes to be assigned between the matched components of the two qualifications
- setting out the agreed credit outcomes in a documented arrangement or agreement, and
- publicising the arrangement/agreement and credit available.

Combination of Pathways

Credit may be awarded on the basis of a combination of credit transfer plus an individual RPL assessment for additional learning. Once credit has been awarded on the basis of RPL, subsequent credit transfer based on these learning outcomes should not include revisiting the RPL assessment but should be based on credit transfer or articulation or other arrangements between providers.

Where candidates for assessment have gained competencies through work and life experience and gaps in their competence are identified, or where they require training in new areas, a combination of pathways may be appropriate.
In such situations, the candidate may undertake an initial assessment to determine their current competency. Once current competency is identified, a structured learning and assessment program ensures that the candidate acquires the required additional competencies identified as gaps.

Assessor Requirements
This section identifies the specific requirements on the vocational competence and experience for assessors, to ensure that they meet the needs of industry and their obligations under AQTF, and clarifies how others may contribute to the assessment process where one person alone does not hold all the required competencies.

Assessor Competencies
The AQTF specifies mandatory competency requirements for assessors. For information, Element 1.4 from the AQTF 2007 *Essential Standards for Registration* follows:

1.4   Training and assessment are conducted by trainers and assessors who:

a)   have the necessary training and assessment competencies as determined by the National Quality Council or its successors, and

b)   have the relevant vocational competencies at least to the level being delivered or assessed, and

c)   can demonstrate current industry skills directly relevant to the training/assessment being undertaken, and

d)   continue to develop their Vocational Education and Training (VET) knowledge and

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> skills as well as their industry currency and trainer/assessor competence.
>
> * See AQTF 2010 *Users' Guide to the Essential Standards for Registration* – Appendix 2

Designing Assessment Tools

This section provides an overview on the use and development of assessment tools.

Use of Assessment Tools

Assessment tools provide a means of collecting the evidence that assessors use in making judgements about whether candidates have achieved competency.

There is no set format or process for the design, production or development of assessment tools. Assessors may use prepared assessment tools, such as those specifically developed to support this Training Package, or they may develop their own.

Using Prepared Assessment Tools

If using prepared assessment tools, assessors should ensure these relate to the current version of the relevant unit of competency. The current unit of competency can be checked on the National Register <*www.ntis.gov.au*>.

Developing Assessment Tools

When developing their own assessment tools, assessors must ensure that the tools:

- are benchmarked against the relevant unit or units of competency;
- are reviewed as part of the validation of assessment strategies required under the AQTF; and
- meet the assessment requirements expressed in the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.

A key reference for assessors developing assessment tools is TAE10 Training and Education Training Package.

Language, Literacy and Numeracy

The design of assessment tools must reflect the language, literacy and numeracy competencies required for the performance of a task in the workplace and not exceed these expectations.

Conducting Assessment

This section details the mandatory assessment requirements and provides information on equity in assessment including reasonable adjustment.

Mandatory Assessment Requirements

Assessments must meet the criteria set out in the AQTF 2010 *Essential Standards for Initial and Continuing Registration*.   For information, the mandatory assessment requirements from Standard 1 from the AQTF 2010 *Essential Standards for Initial and Continuing Registration* are as follows:

1.5   Assessment, including Recognition of Prior Learning (RPL):

a)   meets the requirements of the relevant Training Package or accredited course
b)   is conducted in accordance with the principles of assessment and the rules of evidence
c)   meets workplace and, where relevant, regulatory requirements
d)   is systematically validated.

Assessment of Employability Skills

Employability Skills are integral to workplace competency. As such, they must be considered in the design, customisation, delivery and assessment of vocational education and training programs in an integrated and holistic way, as represented diagrammatically below.
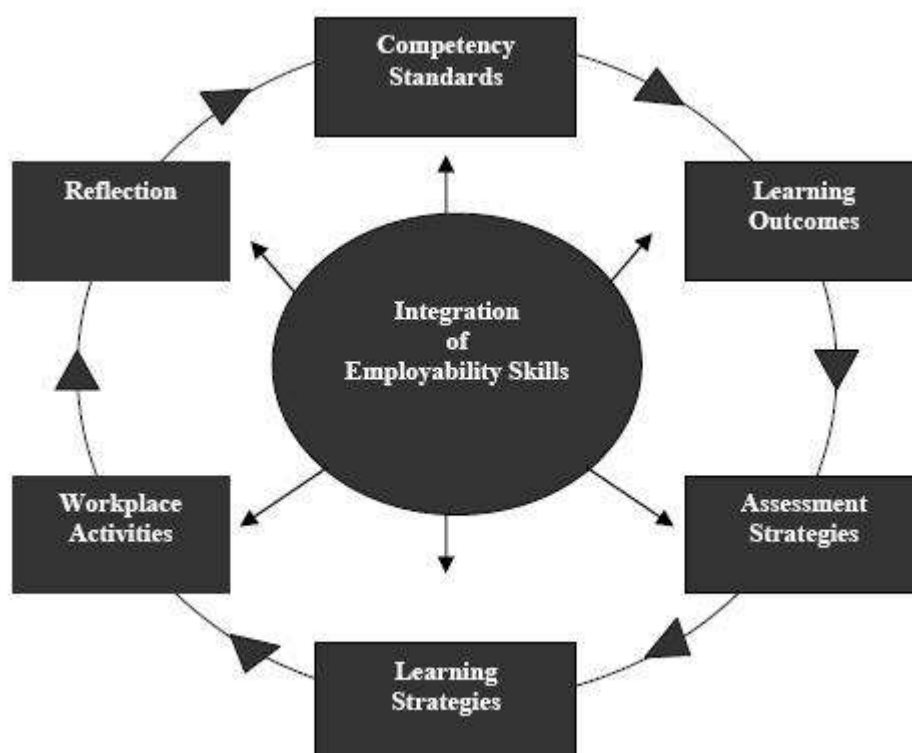
Employability Skills are embedded within each unit of competency, and an Employability Skills Summary is available for each qualification. Training providers must use Employability Skills information in order to design valid and reliable training and assessment strategies. This analysis could include:

- reviewing units of competency to locate relevant Employability Skills and determine how they are applied within the unit
- analysing the Employability Skills Summary for the qualification in which the unit or units are packaged to help clarify relevant industry and workplace contexts and the application of Employability Skills at that qualification outcome
- designing training and assessment to address Employability Skills requirements.

The National Quality Council has endorsed a model for assessing and reporting Employability Skills, which contains further suggestions about good practice strategies in teaching, assessing, learning and reporting Employability Skills. The model is available from <http://www.training.com.au/>.
The endorsed approach includes learners downloading qualification specific Employability Skills Summaries for Training Package qualifications from an online repository at <http://employabilityskills.training.com.au>
For more information on Employability Skills in
Manufacturing Skills Australia Training Packages go to the   Manufacturing Skills Australia website at www.mskills.com.au.
Employability Skills are reported on each qualification using the following statement on the qualification testamur: "A summary of the Employability Skills developed through this qualification can be downloaded from http://employabilityskills.training.com.au "

Access and Equity
An individual's access to the assessment process should not be adversely affected by restrictions placed on the location or context of assessment beyond the requirements specified in this Training Package: training and assessment must be bias-free.
Under the rules for their development, Training Packages must reflect and cater for the increasing diversity of Australia's VET clients and Australia's current and future workforce. The flexibilities offered by Training Packages should enhance opportunities and potential outcomes for all people so that we can all benefit from a wider national skills base and a shared contribution to Australia's economic development and social and cultural life.
Reasonable Adjustments
It is important that education providers take meaningful, transparent and reasonable steps to consult, consider and implement reasonable adjustments for students with disability.
Under the Disability Standards for Education 2005, education providers must make reasonable adjustments for people with disability to the maximum extent that those adjustments do not cause that provider unjustifiable hardship. While 'reasonable adjustment' and 'unjustifiable hardship' are different concepts and involve different considerations, they both seek to strike a balance between the interests of education providers and the interests of students with and without disability.

An adjustment is any measure or action that a student requires because of their disability, and which has the effect of assisting the student to access and participate in education and training on the same basis as students without a disability. An adjustment is reasonable if it achieves this purpose while taking into account factors such as the nature of the student's disability, the views of the student, the potential effect of the adjustment on the student and others who might be affected, and the costs and benefits of making the adjustment.

An education provider is also entitled to maintain the academic integrity of a course or program and to consider the requirements or components that are inherent or essential to its nature when assessing whether an adjustment is reasonable. There may be more than one adjustment that is reasonable in a given set of circumstances; education providers are required to make adjustments that are reasonable and that do not cause them unjustifiable hardship.

The Training Package Guidelines provides more information on reasonable adjustment, including examples of adjustments. *Go to http://www.deewr.gov.au/tpdh/Pages/home.aspx* .

Further Sources *of Information*

The section provides a listing of useful contacts and resources to assist assessors in planning, designing, conducting and reviewing of assessments against this Training Package.

Contacts
Industry Skills Council
Manufacturing Skills Australia
Level 8, 80 Arthur Street
North Sydney NSW 2060
Ph: 02 9955 5500
Fx: 02 9955 8044
W: www.mskills.com.au

Technical and Vocational Education and Training (TVET) Australia Limited
Level 21, 390 St Kilda Road, Melbourne VIC 3150
PO Box 12211, A'Beckett Street Post Office, Melbourne, Victoria, 8006
Ph: +61 3 9832 8100
Fax: +61 3 9832 8198
Email: sales@tvetaustralia.com.au
Web: www.tvetaustralia.com.au

For information on the TAE10 Training and
Education Training Package contact:

Innovation & Business Skills Australia

Telephone: (03) 9815 7000
Facsimile: (03) 9815 7001
Email: virtual@ibsa.org.au

Web: www.ibsa.org.au

General Resources
*AQF Implementation Handbook, Fourth Edition 2007. Australian Qualifications Framework
Advisory Board, 2002* <www.aqf.edu.au>

Australian Quality Training Framework (AQTF) and *AQTF 2010 Users' Guide to the
Essential Standards for Registration –
http://www.training.com.au/pages/menuitem5cbe14d51b49dd34b225261017a62dbc.aspx*

For general information and resources go to http://www.training.com.au/

The National Register is an electronic database providing comprehensive information about
RTOs, Training Packages and accredited courses - <www.ntis.gov.au>
The Training Package Development Handbook site provides National Quality Council policy
for the development of Training Packages. The site also provides guidance material for the
application of that policy, and other useful information and links.
http://www.deewr.gov.au/Skills/Overview/Policy/TPDH/Pages/main.aspx
Assessment Resources
Registered training organisations (RTOs) are at the forefront of vocational education and
training (VET) in Australia.   They translate the needs of industry into relevant, quality,
client-focussed training and assessment.
RTOs should strive for innovation in VET teaching and learning practices and develop highly
flexible approaches to assessment which take cognisance of specific needs of learners, in
order to improve delivery and outcomes of training.
Resources can be purchased or accessed from:

- TVET Australia – provides an integrated service to enable users of the national training
  system to identify and acquire training materials, identify copyright requirements and
  enter licenses for use of that material consistent with the scope and direction of the NQC.

     http://www.productservices.tvetaustralia.com.au/

- Manufacturing Skills Australia

Level 3, 104 Mount Street
North Sydney NSW 2060
Ph: 02 9955 5500
Fx: 02 9955 8044
W: www.mskills.com.au

Competency Standards

What is competency?

The broad concept of industry competency concerns the ability to perform particular tasks and duties to the standard of performance expected in the workplace. Competency requires the application of specified skills, knowledge and attitudes relevant to effective participation in an industry, industry sector or enterprise.

Competency covers all aspects of workplace performance and involves performing individual tasks; managing a range of different tasks; responding to contingencies or breakdowns; and, dealing with the responsibilities of the workplace, including working with others. Workplace competency requires the ability to apply relevant skills, knowledge and attitudes consistently over time and in the required workplace situations and environments. In line with this concept of competency Training Packages focus on what is expected of a competent individual in the workplace as an outcome of learning, rather than focussing on the learning process itself.

Competency standards in Training Packages are determined by industry to meet identified industry skill needs. Competency standards are made up of a number of units of competency each of which describes a key function or role in a particular job function or occupation. Each unit of competency within a Training Package is linked to one or more AQF qualifications.

Contextualisation of Units of Competency by RTOs

Registered Training Organisation (RTOs) may contextualise units of competency to reflect local outcomes required. Contextualisation could involve additions or amendments to the unit of competency to suit particular delivery methods, learner profiles, specific enterprise equipment requirements, or to otherwise meet local needs. However, the integrity of the overall intended outcome of the unit of competency must be maintained.

Any contextualisation of units of competency in this endorsed Training Package must be within the bounds of the following advice. In contextualising units of competency, RTOs:

- must not remove or add to the number and content of elements and performance criteria
- may add specific industry terminology to performance criteria where this does not distort or narrow the competency outcomes
- may make amendments and additions to the range statement as long as such changes do not diminish the breadth of application of the competency and reduce its portability, and/or
- may add detail to the evidence guide in areas such as the critical aspects of evidence or resources and infrastructure required where these expand the breadth of the competency but do not limit its use.

Components of Units of Competency

The components of units of competency are summarised below, in the order in which they appear in each unit of competency.

Unit Title

The unit title is a succinct statement of the outcome of the unit of competency. Each unit of competency title is unique, both within and across Training Packages.

Unit Descriptor

The unit descriptor broadly communicates the content of the unit of competency and the skill area it addresses. Where units of competency have been contextualised from units of

competency from other endorsed Training Packages, summary information is provided. There may also be a brief second paragraph that describes its relationship with other units of competency, and any licensing requirements.

Employability Skills statement

A standard Employability Skills statement appears in each unit of competency. This statement directs trainers and assessors to consider the information contained in the Employability Skills Summary in which the unit of competency is packaged.

Prerequisite Units (optional)

If there are any units of competency that must be completed before the unit, these will be listed.

Application of the Unit

This sub-section fleshes out the unit of competency's scope, purpose and operation in different contexts, for example, by showing how it applies in the workplace.

Competency Field (Optional)

The competency field either reflects the way the units of competency are categorised in the Training Package or denotes the industry sector, specialisation or function. It is an optional component of the unit of competency.

Sector (optional)

The industry sector is a further categorisation of the competency field and identifies the next classification, for example an elective or supervision field.

Elements of Competency

The elements of competency are the basic building blocks of the unit of competency. They describe in terms of outcomes the significant functions and tasks that make up the competency.

Performance Criteria

The performance criteria specify the required performance in relevant tasks, roles, skills and in the applied knowledge that enables competent performance. They are usually written in passive voice. Critical terms or phrases may be written in bold italics and then defined in range statement, in the order of their appearance in the performance criteria.

Required Skills and Knowledge

The essential skills and knowledge are either identified separately or combined. Knowledge identifies what a person needs to know to perform the work in an informed and effective manner. Skills describe the application of knowledge to situations where understanding is converted into a workplace outcome.

Range Statement

The range statement provides a context for the unit of competency, describing essential operating conditions that may be present with training and assessment, depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts. As applicable, the meanings of key terms used in the performance criteria will also be explained in the range statement.

Evidence Guide

The evidence guide is critical in assessment as it provides information to the Registered Training Organisation (RTO) and assessor about how the described competency may be demonstrated. The evidence guide does this by providing a range of evidence for the assessor to make determinations, and by providing the assessment context. The evidence guide describes:

- conditions under which competency must be assessed including variables such as the assessment environment or necessary equipment

- relationships with the assessment of any other units of competency
- suitable methodologies for conducting assessment including the potential for workplace simulation
- resource implications, for example access to particular equipment, infrastructure or situations
- how consistency in performance can be assessed over time, various contexts and with a range of evidence, and expectations at the AQF qualification level involved

Employability Skills in units of competency
The detail and application of Employability Skills facets will vary according to the job-role requirements of each industry. In developing Training Packages, industry stakeholders are consulted to identify appropriate facets of Employability Skills which are incorporated into the relevant units of competency and qualifications.

Employability Skills are not a discrete requirement contained in units of competency (as was the case with Key Competencies). Employability Skills are specifically expressed in the context of the work outcomes described in units of competency and will appear in elements, performance criteria, range statements and evidence guides. As a result, users of Training Packages are required to review the entire unit of competency in order to accurately determine Employability Skills requirements.

How Employability Skills relate to the Key Competencies
The eight nationally agreed Employability Skills now replace the seven Key Competencies in Training Packages. Trainers and assessors who have used Training Packages prior to the introduction of Employability Skills may find the following comparison useful.

Employability Skills	Mayer Key Competencies
Communication	Communicating ideas and information
Teamwork	Working with others and in teams
Problem solving	Solving problems Using mathematical ideas and techniques
Initiative and enterprise	
Planning and organising	Collecting, analysing and organising information Planning and organising activities
Self-management	
Learning	
Technology	Using technology

When analysing the above table it is important to consider the relationship and natural overlap of Employability Skills. For example, using technology may involve communication skills and combine the understanding of mathematical concepts.

Explicitly embedding Employability Skills in units of competency

This Training Package seeks to ensure that industry-endorsed Employability Skills are explicitly embedded in units of competency. The application of each skill and the level of detail included in each part of the unit will vary according to industry requirements and the nature of the unit of competency.

Employability Skills must be both explicit and embedded within units of competency. This means that Employability Skills will be:

- embedded in units of competency as part of the other performance requirements that make up the competency as a whole
- explicitly described within units of competency to enable Training Packages users to identify accurately the performance requirements of each unit with regards to Employability Skills.

This Training Package also seeks to ensure that Employability Skills are well-defined and written into units of competency so that they are apparent, clear and can be delivered and assessed as an essential component of unit work outcomes.

The following table contains examples of embedded Employability Skills for each component of a unit of competency. Please note that in the examples below the bracketed skills are provided only for clarification and will not be present in units of competency within this Training Package.

Example Employability Skills unit

Unit component	Example of embedded Employability Skill
Unit Title	Optimise process/plant area (initiative and enterprise, problem solving, technology)
Unit Descriptor	This competency covers the ability to optimise the process performance of a complete plant area. It includes ensuring that production systems comply with Health, Safety and Environment (HSE) requirements, that process, plant and equipment utilisation is planned and carried out, and that problems are solved to fully meet operational needs and ensure that production of finished goods meets customer requirements. (Self management, technology, initiative and enterprise, planning and organising, problem solving)
Element	Coordinate corrective and/or optimisation action plan (Teamwork, planning and organising, communication)
Performance Criteria	Develop optimisation plan taking account of hazards identified and HSE implications and communicate to appropriate personnel. (Initiative and enterprise, learning,communication, technology, problem solving, self management, teamwork)
Range	This unit describes the work conducted by senior operators, team leaders or

Statement	front line managers who optimise process systems as part of their work function. It includes all items of equipment and unit operations which form part of the production process of a complete area. (Teamwork, learning, problem solving, self management, technology)
Required Skills and Knowledge	Optimising process systems requires application of detailed operational and process knowledge to address issues (Learning, planning and organising, problem solving)
Evidence Guide	While the technician is expected to take a lead technical role, and to demonstrate competence as defined above, optimisation is rarely undertaken by an individual alone and liaison with all relevant stakeholders is an expected part of this competency. (Technology, learning, communication, teamwork)

Industry Contextualisation

MSA07 – General advice for contextualisation

Competency units may, and in some cases should, be contextualised to the sub-sector and type of work environment involved. Contextualisation which:

- replaces general directions with enterprise specific needs
- replaces generic equipment/process names with enterprise specific names
- replaces general processes/specifications with enterprise specific needs

is allowed and encouraged, provided the contextualised unit is of similar level and rigour to the original competency unit.

Note that contextualising cannot be used to generate an additional competency which is closely related to an existing competency. Contextualisation can only be used to generate an alternative competency for qualifications purposes.

Contextualisation may only be done if it does not significantly change the level and rigour or change the application of the unit. Contextualisation may be done within the required knowledge, range of variables and the evidence guide. Lists in these sections should be regarded as indicative lists unless otherwise stated.

Note also that contextualisation of the elements or performance criteria is not permitted. As a minimum, the contextualised unit should:

- be of similar level and rigour
- be of a similar breadth, complexity and size
- be relevant to the industry sector and the enterprise
- not reduce the health, safety or environmental requirements

- retain the original unit code and title.

Importing units from other Training Packages

Competency units may be imported from another endorsed Training Package to customise a qualification. These imported units may be used to replace the maximum number of imported units that are identified in the packaging rules. The use of imported units is allowed if:

- they are from an endorsed Training Package and are packaged at the same AQF certificate level (the original unit title and code number must be retained)
- they are appropriate to the needs of the enterprise
- any prerequisites and co-requisites specified in the original unit and any specific assessment requirements in the host Training Package are also observed.

Exporting units to other Training Packages

Manufacturing Skills Australia encourages other industries and ISCs to access the units of competency in this Training Package which might be appropriate to their needs. These competencies may be used provided:

- the original unit code and title are retained
- they are only contextualised to the extent permitted above
- any specified prerequisites and co-requisites and any specific assessment requirements in the host Training Package are observed

Manufacturing Skills Australia is advised of the specific competencies to be used to facilitate ongoing communication in the event of an update.

Appendix 1:   MSA10107 Certificate I in Manufacturing (Pathways)

Research

The Certificate I in *Industry* (Pathways) developed out of research commissioned by the Australian National Training Authority and undertaken by Ratio Pty Ltd over the past three years. Initial research identified that a range of stakeholders considered that a mechanism was needed to:

- explicitly address Employability Skills as described in the report, *Employability Skills For the Future*, BCA/ACCI, 2002
- create pathways into further study, school continuation and/or employment for those for whom traditional pathways were not sufficient or accessible
- assist potential employees in making more informed choices about careers.

Phase One: 2002-2003

In summary, this stage of the research established two main points.

- Across the country a wide range of existing courses and programs sought to address these issues for equity groups which are not part of an industry Training Package and therefore the Australian Qualification Framework (AQF). They focused on the needs of the learners without providing the industry focus or achieving a nationally recognised qualification.
- Current Certificate I qualifications within Training Packages were largely generalist qualifications nestled in higher level qualifications which addressed some of the Employability Skills, but lacked a focus on technical skills. With some exceptions, they were not held in high regard by industry or RTOs.

This research recommended that a qualification be developed which is:

- a recognised qualification in a Training Package
- flexible across Training Packages
- delivered in a work context through one or more meaningful work activities.

It was anticipated that such a qualification would provide a bridge between learner needs and industry need.

Phase Two: 2004-2005

The consultants, with the support of the State and Territory Training Authorities (STAs) and an industry reference group, worked with three Industry Skills Councils (ISCs) to develop a consistent yet customisable qualification.
The ISCs involved were:

      Agri-Food Industry Skills Council
      Manufacturing Skills Australia (MSA)
      TDT Australia (Transport and Logistics).

Pathways qualification model

The qualification model developed was characterised by the following units of competency and structure.

- One core industry unit – this reflects a core industry activity or function and should be delivered as such, with a defined beginning, middle and end. This unit ensures that the qualification has a practical hands-on focus and provides an understanding of the industry.
- Three pathway units – these specifically address the Employability Skills and ideally should be delivered by clustering the units around the core industry unit.
- Two technical units – these provide the underpinning skills and knowledge for the core industry unit and provide articulation into higher industry qualifications.
- Up to three units from any Training Package – these provide the flexibility to cater to the needs of different learner groups, different employers and different contexts. For example, language and literacy units, units from other Training Packages or higher level units from Training Packages from within the same ISC.

Phase Three: 2005-2006
In this latest phase of the research the consultants were contracted to conduct a trial of the Pathways Certificate with a range of target groups in a range of contexts.
It was considered important to ensure that the qualification:

- was sound in structure and content so that it would be adopted across industry and valued by industry and the community
- was able to be implemented by the range of RTOs
- created meaningful pathways for the learners
- provided explicit learning in the Employability Skills.

Stakeholder consultations

Throughout the trial period there were ongoing consultations and discussions with the participating ISCs and STAs. Meetings with representatives from the relevant sections of the state training and education departments were organised to correspond with the site visits in each state.

Participating RTOs and programs delivered
The trial deliberately set out to sample a range of RTO types across different states. The following RTOs participated.

State	Industry	RTO Type	Name
Victoria	Transport	Private	Banksia Consulting
New South Wales	Transport	TAFE School partnership	Hunter Institute of TAFE, Glendale Campus
Tasmania	Transport	Community owned not-for-profit Job Network provider	STEPS Education and Training Solutions
Tasmania	Agri-Food	TAFE	TAFE Tasmania, Launceston

Western Australia	Agri-Food	Residential Provider for youth at risk	Great Southern TAFE, Gnowangerup
Queensland	Agri-Food	TAFE	Brisbane TAFE
South Australia	Manufacturing	Industry/TAFE School partnership	TAFE SA Regency campus/Schefenacker Vision Systems*
South Australia	Manufacturing	TAFE	TAFE SA, Port Adelaide Campus
These RTOs are participating from February 2006 to be completed by June 2006			
Western Australia	Manufacturing	TAFE/School partner ship	Challenger TAFE with Warnbro High School
Northern Territory	Agri-Food	School	Taminmin High School, Humpty Doo

(*This trial was undertaken with Schefenacker Vision Systems providing industry experience for participants.)

Other consultations and presentations included:

- Equity advisors from each State and Territory
- CEOs of all of the ISCs
- Boards of Studies − Australian Curriculum Assessment and Certification Authority (ACACA), Victorian Curriculum and Assessment Authority (VCAA)
- Australian Chamber of Commerce and Industry (ACCI)
- TAFE NSW International Centre for VET Teaching and Learning (ICVET)
- 2005 Connecting Access Workshop through TAFE NSW in Sydney
- Brian Cramond from DFEEST SA presented to the Australian Vocational Education Training Research Association (AVETRA)
- Andrew Nicholson from the trial site at Great Southern TAFE in WA presented to the Teen Teachers Forum.

Trial outcomes
The Pathways Certificate is a viable qualification within the Training Package framework. In terms of Training Package qualifications the Pathways Certificate is unique. It:

- is an industry-based qualification, but is not specific to one job outcome
- is preparatory, but combines a practical work activity
- explicitly addresses Employability Skills and technical skills
- is sufficiently flexible to address local needs, yet it has a common across industry structure
- has unique pathways units, but uses Training Package units thereby providing some articulation
- can be used for workforce entry and re-entry, or induction

- provides for participants needs but focuses on work readiness within one particular industry
- focuses on a pathway and the destination.

Because it is practical, work-based and industry-focused it is compatible with Training Package qualifications and is consistent with the AQF. It also is a very useful tool for industries to attract potential employees and give them credit into higher qualifications.

However, it is different in that it provides work readiness as opposed to job readiness, requires a particular training methodology, and is applicable across Training Packages within an ISC; therefore it requires a special status within Training Packages.

Each of the three trialed qualifications, ie the three qualifications covering Agri-Food, Manufacturing and Transport, shares the same structure, qualifications framework and pathways units. These aspects of the qualification have been thoroughly tested and endorsed by trainers, coordinators, ISC personnel and other industry personnel. Consistency in these matters is important for maintaining the quality, achieving the outcomes and marketing and branding.

Following conditional endorsement of the trialed qualifications, it was recommended that each of the 3 ISCs submit a Certificate I (Pathways) qualification for final endorsement, utilizing the three core Pathways units and drawing on industry specific units of competency from current Training Packages.

Appendix 2:   Development of the Process Manufacturing Certificates and generic manufacturing units

In Phase 1 of the review of the Plastics, Rubber and Cablemaking Training Package (PMB01), the production support certificates in PMA, PMB and PMC were reviewed to determine commonalities and potential for rationalisation. The review determined that, as there were minimal differences between the existing certificates, there would be considerable benefits to both industry and RTOs if the mandatory units and the production support certificates were generalised, for use across all three packages.

It was agreed that this work would be undertaken as part of the review of PMB01 and that the common certificates would be developed for inclusion in the Manufacturing Training Package (MSA07). These certificates will be available for use across the three process manufacturing Training Packages.

The existing production support certificates in PMB01 have not been carried forward to PMB07. As part of the current review of PMA and maintenance of PMC, it is intended that the production support certificates in these packages will also be replaced by the MSA Process Manufacturing certificates.

As part of the re-development work, Certificate III in Process Manufacturing has been reviewed to bring it into line with AQF descriptors. To address this need, which was identified by industry, RTOs and Government stakeholders, the mandatory (core) units have been altered and a requirement to attain competency in a minimum number of Certificate III units has been maintained. The focus of this certificate remains on addressing training needs of people whose job roles support the production process.

In addition, it was also recognised that there was significant duplication in the support units currently available at Certificates IV, Diplomas and Advanced Diplomas in PMA, PMB and PMC. A range of rationalised support units has been developed for use across the three packages. These units will be endorsed as free electives in MSA07, not aligned to any MSA qualifications at this time, but available for importation to PMA, PMB and PMC.

This project has been overseen by the PMB Project Reference Group and the Process Manufacturing Industry Advisory Committee. Consultations were undertaken in conjunction with the review of PMB01 and have involved the State/Territory ITAB and RTO networks.

Membership of the Project Reference Group

Organisation	Nominee	Representing
PACIA NSW	Stephen Holland	Plastics
Viscount Plastics (Australia) P/L	Ian Kidd	Plastics industry
National Union of Workers	Julie Warren	Union
Assoc of Rotational Moulders A'sia	Leisa Donlan	Rotational moulding
Ai Group	John Quick	Plastics
Buchanan Advanced Composites	Norm Watt	Composites
TAFE NSW – MECATCC	Kim Peterson	Public provider – NSW
Kangan Batman Institute	Bill Rees	Public provider – Vic
Newskills Ltd	Stephen de Rozairo	Private provider – Vic
Applied Training Solutions	Carlo Lauricella	Private provider – NSW
OTTE	John Scott	State Government

Members of Process Manufacturing Industry Advisory Committee

Member	Organisation	Representing
David Graham	Huntsman Chemical Co (MSA Director)	PACIA (plastics and chemicals)

Doug Stevens	National Union of Workers (MSA Director)	NUW (plastics)
Julie Warren	National Union of Workers	NUW (plastics)
Brian Tobin	Readymix Beenleigh Quarry	Concrete Products (premix)
John Turton	Cement, Concrete and Aggregates Australia	CCAA (cement and concrete)
Don Sanders	Australian Petroleum Production and Exploration Assn Ltd	APPEA (hydrocarbons)
Leisa Donlan	Assoc of Rotational Moulders Australasia	ARMA (plastics)
Alan Bugg	Huntsman Chemical Co Aust Ltd	AWU (chemical)
Vince Lloyd	Qenos	AWU (chemical)
Chris Nail	Foseco Pty Ltd	Manufactured Mineral Products (Refractories)
Norm Watt	Buchanan Advanced Composites	Composites Australia

Appendix 3:   Background to the Competitive Manufacturing Qualifications

The Competitive Manufacturing Training Package was developed by the Competitive Manufacturing Initiative (CMI).

Overview of the CMI

The Competitive Manufacturing Initiative (CMI) was a collaborative response from Australia's Manufacturing Industry Training Advisory Bodies (ITABs) to assist manufacturing industry improve manufacturing practice through the development of innovative vocational education and training (VET) qualifications and units of competency. The CMI development process was funded by ANTA. The original scoping project for the CMI was majority funded by industry.

The following ITABs formed the Project Management Group for the initial development of the Competitive Manufacturing Training Package.

- **Automotive Training Australia** which covered:
  - passenger vehicles
  - trucks
  - bus and trailer manufacturing
  - most coach and body building

- vehicle repair, service and retail
- automotive after market, and
- some component manufacturing.
- **Light Manufacturing Training Australia** which covered:
  - the textile clothing, footwear and leather industries. and
  - the furnishing industry.
- **Manufacturing Learning Australia** which covered process manufacturing industries such as:
  - chemical
  - hydrocarbons
  - oil
  - plastics
  - rubber
  - cablemaking
  - cement
  - clay
  - ceramic
  - concrete
  - refractories
  - plaster, and
  - fibre board.
- **Manufacturing Engineering and Related Services ITAB** which covered:
  - metal and engineering related manufacturing
  - heavy engineering
  - maintenance
  - aerospace, and
  - boating.
- **National Food Industry Training Council** which covered:
  - food and beverage
  - pharmaceutical, and
  - tobacco processing and manufacturing.

MERS ITAB acted as the secretariat for the development of Competitive Manufacturing. However, users should now contact Manufacturing Skills Australia (MSA), the national Industry Skills Council that covers manufacturing to seek specific advice relevant to their area. Contact MSA on telephone (02) 9955 5500 or at www.mskills.com.au. The CMI website should also be checked for information and advice at www.cmi.org.au.

Industry coverage

The Competitive Manufacturing qualifications cover all of the manufacturing industry. At the 2001 census, the manufacturing industry employed 1,010,179 persons or 12% of the entire workforce. Manufacturing is the biggest sector in terms of contribution to gross domestic product where it contributes 13 % of the total product[1] and is also the sector with the highest value added contributing 12% of the total value added[2] to the economy. The Australian Bureau of Statistics notes[3] that 'Manufacturing contributed more to Australian production than any other industry'.

1. Manufacturing Industry Australia, 1999-2000, ABS, 8221.0

2.   Australian System of National Accounts, 2002-2003, ABS, 5204.0
3.   Manufacturing Industry Australia, 1999-2000, ABS 8221.0

The CM qualifications are complementary to qualifications in existing Training Packages covering specific manufacturing sectors. These sector specific Training Packages cover the knowledge and skills specifically required by those sectors. The CM qualifications cover knowledge and skills associated with manufacturing practices and systems which are common across manufacturing sectors.

Development of the Competitive Manufacturing qualifications

This project originated out of discussions within the Board of the Foundation for Australian Manufacturing Education (FAME) and the initial scoping study was financially supported by FAME, Australian Business Ltd and ANTA. Support for the project's aims and objectives was also given by the Australian Manufacturing Centre (AMC) and the Australian Industry Group. This scoping project found that there was a bias in the then existing Training Packages of specific technical skills and insufficient coverage of the skills needed to manage, supervise and implement system skills needed in modern manufacturing. The scoping report identified a need for the development of units of competency in manufacturing practice, and possibly also qualifications in manufacturing practice.

The CMI Stage 2 project:

- investigated the scope of skills to be included in the CMI
- developed a marketing strategy and established a CMI website
- established a formal cooperative mechanism amongst the manufacturing ITABs
- established a brand and logo based on the title Competitive Manufacturing Initiative (CMI).

The CMI Stage 3 project then developed and validated a number of units of competency and qualifications. The development and validation was done by consulting industry generally and also by the use of industry experts. Care was taken through this process to ensure there was representation of each industry sector and type of manufacturing process. The use of competitive manufacturing practices is variable across the manufacturing sector, and one of the aims of developing this Training Package is to make training in these skills more widely available, so helping industry operate more effectively in a competitive environment. Initial consultation therefore focussed more on identified leaders in this area while validation focused more on the broader manufacturing industry.

Consultations undertaken as part of CMI Stage 2 and confirmed in Stage 3 indicated that the CM qualifications and units would represent new content for many RTOs and that many of the skills could only be taught and assessed in a workplace environment. CMI Stage 3 therefore included a process to allow early identification of delivery issues through a trial site process. Five trial sites were selected to cover both a number of states and also each major industry sector. The trial sites used[4] the draft CM units to map the draft units to current delivery and to validate the units and to determine any delivery issues. The trial sites were:

- Goulburn Ovens Institute of TAFE – Shepparton Campus
- Hunter Institute of Technology
- Onkaparinga Institute of TAFE
- Swinburne University – VET Division

- Western Sydney Institute of TAFE – Mt Druitt Campus

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[4] As the units were not endorsed at this stage there were some practical limitations on the 'use' of these units.

The Technology Cadetships

In August 2003 the Australian Industry Group with funding assistance from ANTA established a Manufacturing Technician Training Initiative project known colloquially as the Technology Cadetship Project. The aim of the project was to develop and promote more efficient pathways for school leavers to enter technical occupations in manufacturing industry. One of the key objectives was to establish entry level qualifications linked to on and off the job training in a cadetship arrangement.

The origin of the project was partly Australian Industry Group work on the National Industry Skills Initiative as well as comments and concerns by Ai Group members that pathways for the development of technician level skills in manufacturing were inefficient and generally took too long to be attractive to either enterprises or young people.

The Ai Group Manufacturing Technician Training Initiative included activities in a number of areas that were broader than a normal Training Package development project.   These areas were:

- Identification and/or development of appropriate content in existing and/or new Training Packages;
- Marketing of technician level contract of employment arrangements to employers, young people, industry and the community generally;
- Establishment of appropriate employment arrangements;
- Establishing arrangements for the approval of contracts of employment by State Training Agencies
- Establishment of appropriate funding arrangements for both mainstream training delivery and employer financial incentives;
- Marketing of actual placements to Ai Group members and other employers.

While the Australian Industry Group conducted much of the content research and development for this submission, both the Ai Group and ANTA realised that Ai Group would not be able to put forward the new qualifications for endorsement under current policy arrangements.

The Australian Industry Group was consulted on the development of the Competitive Manufacturing Training Package and decided that the CM was the most appropriate body to take over on a longer term basis the future content development of the Technology Cadetship and responsibility for endorsement of the work done to date. The CMI ITABs and Ai Group also agreed that the qualifications and units for the Technology Cadetship should be part of the responsibilities of the Manufacturing Industry Skills Council once it was established.

The Manufacturing Industry Skills Council has now been established and it is anticipated that the Competitive Manufacturing Initiative will continue to exist as a sub committee function in the Manufacturing Skills Council and that arrangements will be made for on going participation of the Agri-Foods Skills Council and for automotive industry representation.

The term Technology Cadetship was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships although the principle of combined off and on the training and mutual obligation of employer and employee is the same.

Appendix 4:   Technology Cadetship – metallurgy and polymer technology streams

MSA07v3 Manufacturing Technology qualifications – metallurgy and polymer technology specialist streams

The previous Certificate III in Manufacturing Technology and the Certificate IV in Manufacturing Technology provided four specialist streams. These were:

- CAD/drafting
- Manufacturing operations
- Technical Officer
- Laboratory operations

The new polymer technology stream will provide new specialisations within both qualifications. The metallurgy stream will provide a specialisation within the Certificate III. Industry advises there is no work outcome at Certificate IV.

In addition, metallurgy and polymer technology specialist streams have been developed at the Diploma and Advanced Diploma levels, hence two new qualifications (Diploma and Advanced Diploma in Manufacturing Technology) are also part of this endorsement submission. These are the first streams for the Diploma and Advanced Diploma qualification levels to be completed. Other industry specialisations for these qualifications are under development by Manufacturing Skills Australia (MSA).

Background to the Technology Cadetships

The new streams, like all existing streams for the Certificate III and IV in Manufacturing Technology, have been developed to be undertaken as part of an entry level qualification linked to on and off the job training in a cadetship arrangement known colloquially as a *technology cadetship*.   The term *technology cadetship* was developed to differentiate the level of training from that commonly found in apprenticeships and traineeships, although the principle of combined off and on the job training, a formal contract of training and mutual obligation of employer and employee is the same. As in apprenticeships and traineeships the qualifications have a separate title from that used for the cadetship.

Employment arrangements for students of the metallurgy or polymer technology specialisations can vary according to the circumstances of each student. It is anticipated that most students will be undertaking a technology cadetship which will be supported by Award, enterprise agreement or Australian Workplace Agreement employment arrangements. A special Award for the employment of Technology Cadets was created by consent between the Australian Industry Group, the Engineering Employers Association South Australia, the Australian Manufacturing Workers Union and the Australian Workers Union. This Award is known as the *Manufacturing And Associated Industries – Skills Development - Wages And Conditions Award 2004*.

Project Management
Development of the metallurgy and polymer technology streams was part of a broader project known as the Competitive Manufacturing Initiative (CMI) Stage 5.   This project included development of additional specialisations for the Technology Cadetships as well as development of a new school subject in manufacturing studies for higher achieving year 11 and 12 school students.

CMI Stage 5 was conducted under the oversight of the Strategic Manufacturing Initiatives Industry Advisory Committee of the Manufacturing Skills Australia Board.

Strategic Manufacturing Initiatives IAC membership

Ian Curry MSA Director	National Projects Officer Australian Manufacturing Worker's Union
David Graham MSA Director	Learning & Development Manager Huntsman Chemical Company
Michael Grogan MSA Director	Chief Executive Officer Sutton Tools
Martin Lewis MSA Alternate Director	Chief Executive Officer Furnishing Industry Association of Australia
Megan Lilly MSA Director	Associate Director – Education & Training Australian Industry Group
Matt Murphy MSA Director	Communications, Electrical, Plumbing Union

Day to day supervision of the CMI Stage 5 project was delegated to Bob Paton CEO and Sue Woodward Deputy CEO of MSA.

Richard Jenkins and Associates were contracted to undertake this work. Consultants who worked on the project were Richard Jenkins, Kevin Hummel and Kerrie Clarke.

Metallurgy stream

Metallurgists can be degree qualified or have qualifications issued through the vocational training and education sector. Metallurgists work across manufacturing in a number of sectors and roles. Sectors include:

- processing of ores and refining and smelting of metals;
- foundries;
- diecasting;
- steel making
- fabrication and welding of structures;
- metal protection and corrosion control.

Metallurgists are involved in the specification and supervision of the processing of metallic ores as well as metal smelting, refining, melting, pouring, joining, fabricating and finishing processes. Metallurgists working in the mining and processing of metallic ores are often called primary metallurgists while metallurgists specifying and supervising producing metal or metal products are often called industrial or secondary metallurgists. Primary metallurgists generally though not exclusively are degree qualified while secondary metallurgists can be either VTE or degree qualified. Because of the low demand for VTE primary metallurgists this pathway and submission concentrates on skills required for secondary metallurgists.

The metallurgy stream development process involved:

- initial separate approaches by the Australian Foundry Institute and Central TAFE in Western Australia to MSA for the development of metallurgy qualifications. After considering these requests MSA decided that the best approach would be to develop qualifications and units of competency as part of the Manufacturing Technology qualifications allied with the Technology Cadetship initiative as this would allow the widest coverage across manufacturing and also facilitate entry level training. It was also envisaged that the metallurgy units of competency that were to be developed would be imported into the Metal and Engineering Training Package after endorsement to enhance the range of electives available in the Diploma of Engineering –Technical and Advanced Diploma of Engineering qualifications in that Training Package.
- consultation with enterprises, industry organisations and RTOs to confirm support for the proposed stream. Consultations were both face to face and by telephone.
- a review of existing endorsed units of competency for relevance to the metallurgy stream. While a range of units relevant to metallurgy were identified, these were mostly of a supporting nature. The review found that most metallurgy related skills would need to be covered by new units of competency.
- visits to foundries in several States and to steelmaking plants in Newcastle and Wollongong to meet with metallurgists and to observe first hand their duties and work environment
- development of draft units of competency and a specialist stream qualification structure within the existing manufacturing technology qualifications. Employability skills were embedded in all new units of competency.
- preparation and distribution of first, second and final drafts for industry and RTO comment and review.

Consultations

The development of the metallurgy units and associated units of competence involved substantial industry and RTO contributions. Special mention needs to be made of the support and assistance provided by the Australian Foundry Institute, Central TAFE in Perth, Hunter Institute of Technology and Bluescope Steel.

The Australian Foundry Institute delegated its Queensland Branch to form a sub–committee especially to liaise with and assist the project consultant. This sub-committee facilitated access to workplaces and met with the project consultant numerous times to provide technical information and to review drafts.

Central TAFE in Western Australia and the Hunter Institute of Technology in Newcastle provided full access to their current State accredited metallurgy qualifications and hosted several visits by the project consultant. Central TAFE also conducted surveys of WA industry to obtain comments on the draft pathway and units of competence.

Bluescope Steel provided access on a commercial in confidence basis to several internal DACUM analyses and job descriptions for metallurgists. As well Bluescope hosted several plant visits by the project consultants.

Drafts of the metallurgy stream and units of competence were distributed to major enterprises, industry associations, relevant unions, major RTOs and State ITAB contacts.   Besides the general distribution to the above organisations, a range of selected individuals in each organisation were also contacted.

Many of these organisations also passed on the drafts through their own networks. For example the Australian Industry Group advised that the drafts had been distributed to their network of industry training advisors who in turn distributed them to interested members. A list of individuals contacted directly for consultations and/or distribution of draft pathways and units follows.

Megan Lilly, Australian Industry Group (plus all Ai Group Training Advisers)
Ian Curry, AMWU
Margie John, SA TAFE
Deb Doherty, Office of Post-Compulsory Education & Training, Tasmania
Remy Jayasekere, Central TAFE, WA
Bruce Wilson, Central TAFE, WA
Stephen Davies, NSW TAFE MEC&T Curriculum Centre
Paul Kennett, Manufacturing and Engineering Skills Advisory Body of Victoria
Sue Fraser, EEASA Group Training SA
Simon Kay, Toowoomba Metal Technologies
Richard Bozza, Toowoomba Metal Technologies
Michael Wright, Bradken Runcorn Foundry Queensland
Greg Newton, Bradken Runcorn Foundry Queensland
Stojan Lemut, Bradken Henderson Foundry Western Australia
Craig Lee, Bradken Henderson Foundry Western Australia
John Elliot, White Industries Dalby Queensland
Bob Murray, Wear Tech Foundry Queensland

John Walter, Investment Castings Queensland
Rod Brown, Austcast Queensland
Michael Lee, CAST CRC Melbourne
Chris Shaw, Queensland Railways Redbank Foundry
Ken Nicholl, Hunter Institute of Technology
Karen Humphreys, Hunter Institute of Technology
Scott Orpin, OneSteel Newcastle
Steve Dowey, Surface Technology Coatings and Suttons Tools Melbourne
Derry Doyle, Surface Technology Coatings and Suttons Tools Melbourne
Phillip Rouse, BlueScope Steel   Port Kembla
Stephen Irving, BlueScope Steel   Port Kembla
Max Voight, PAC Foundry Pty Ltd, Queensland
John Cawley, Swinburne University Centre for New Manufacturing
Brad Walsh, Dickinson's Metallurgical Supplies, South Australia
Shelley Smailes, METS CSSN Portfolio Officer, WA TAFE
Marty Burgess, Illawarra Institute of TAFE NSW
David Tiller, Australian Industry Group   NSW
Ewan O'Leary, Weir Minerals Sydney

In addition to the above direct consultations the Australian Foundry Institute distributed draft copies of the units and qualifications to their members in all States and Territories.   Support for the drafts was received from each Branch of the AFI.

There was substantial enthusiasm and support for the development and endorsement of the metallurgy pathway from all individuals and organisations consulted.

Polymer technology stream

The polymer technology stream covers technician level skills required by the plastics, rubber and cablemaking industries. **These industries employ a**pproximately 48,000 people and consist of:

- plastics - including injection moulding, blow moulding, blown film, rotational moulding, fabrication, composites, compounding and reclamation, extrusion and thermoforming
- rubber - including belt splicing, extrusion, rubber lining, tyre building and tyre retreading
- cablemaking - including power transmission and communication cables.

The Polymer Technology stream is intended for people who plan to become polymer technicians, and who are not currently working as operators in the polymer industries. It is recommended that those who have already achieved a Certificate II from the Plastics, Rubber and Cablemaking Training Package would be better served by completing the Certificate III in Polymer Processing.

The polymer technology stream development process used the same basic processes for development as was used for the development of the existing endorsed specialist streams. This involved:

- initial consultation with industry and RTO to re-confirm support for the proposed pathway. Initial support had been identified in the Technology Cadetship Expansion Scoping Study report by MSA in April 2005.
- review of existing endorsed units for relevance to the polymer technology stream.
- identification of gaps and writing of new units of competency to meet these gaps
- development of a specialist stream for the existing manufacturing technology qualifications
- preparation of first, second and final drafts for industry and RTO comment and review.

The early consultations indicted continuing support and enthusiasm for the development of a polymer technology stream for Technology Cadetship related qualifications.

After confirming continuing support, currently endorsed units were evaluated for relevance to the proposed polymer technology stream. The two main Training Packages examined were the Plastics, Rubber & Cablemaking Training Package (PMB01) and the Competitive Manufacturing Training Package (MCM04).   This examination revealed that most units required for the stream were already endorsed. A need for six new polymer technology units was identified. In addition there was support for incorporation of three generic sustainability units because of the importance of environmental and sustainability issues to the plastics, rubber and cablemaking industries.

Discussions were also held with MSA staff and consultants involved in the review of the Plastics, Rubber & Cablemaking Training Package (PMB01) to ensure that there was co-ordination between the two projects. New units developed as part of the polymer technology pathway have been coded as PMB units and have been incorporated into PMB07 which was endorsed on 16/11/07.

Consultations
Drafts of the polymer technology stream and units of competence were distributed to major enterprises, industry associations, relevant unions, State Training Authorities, major RTOs and State ITAB contacts.   Besides the general distribution to the above organisations, a range of selected individuals in each organisation were also contacted.

Many of these organisations also passed on the drafts through their own networks. For example the Australian Industry Group advised that the drafts had been distributed to their network of industry training advisors who in turn distributed them to interested members. A list of individuals contacted for consultations and/or distribution of draft pathways and units follows.

Alistair Martin, Vinidex WA
Ian Kidd, Viscount Plastics, Perth
Stephen Holland, Plastics and Chemicals Industries Association (PACIA)
Leisa Donlan, Association of Rotational Moulders Australia, Brisbane
Gary Rayner, Schefenacker Vision Systems
Roger Cater, Plastics and Rubber Technical Educational Centre (PARTEC) Qld
Barry De Sylva, PARTEC, Brisbane
Sue Fraser, EEASA Group Training SA
Megan Lilly, Australian Industry Group (plus all Ai Group Training Advisers)

Ian Curry, AMWU
Doug Stevens, National Union of Workers
Julie Warren, National Union of Workers
Margie Johns, SA TAFE
Deb Doherty, Office of Post-Compulsory Education & Training, Tasmania
Larry Taylor, TAFE Tasmania
Peter Ebel, Central TAFE, WA
Graham Walsh, JAG Assignments (VET consultant in Tasmania)
David McIntee, Northern Group Training Company, Tasmania
Kim Peterson, NSW TAFE MEC&T Curriculum Centre
Leslie Faulstone, NSW TAFE
Stephen Dawkins, NSW TAFE
Peter Harper, NSW TAFE
Bill Brees, Kangan Batman Institute of TAFE
John Molenaar, Manufacturing and Engineering Skills Advisory Body of Victoria
Stephen De Rozairo, Newskills (RTO) Melbourne,
Carlo Lauricella, Applied Training Solutions (RTO), Sydney,
John Quick, AiGroup, Sydney
John Scott, OTTE, Melbourne,
Trevor Lange, Curriculum Maintenance Manager, Chisholm Institute of TAFE

Appendix 5:   Technology Cadetship – structural steel detailing stream

MSA07v3.1 – Manufacturing Technology - new structural steel detailing specialist stream

Project background

Structural steel detailing involves taking a design for a steel structure such as a steel framed building prepared by an engineer or architect and transforming it into a series of complete working drawings and erection diagrams for use by steel fabricators and builders. In preparing the drawings steel detailers are often required to liaise with engineers, architects, design draftspersons, fabricators and builders. The steel detailer is required to create drawings for all components of a steel structure including all welded and bolted connections. The work of the steel detailer is critical as they produce all the detailed instructions that enable both fabrication and construction to occur. Structural steel detailing enterprises are usually small with a range from single person businesses to 15-20 employees. There are a small number of larger structural steel detailing enterprises and an unknown number structural steel detailers also work for large builders and fabricators.

Structural steel detailing has been covered by a single specialist unit in the Metal and Engineering Training Package for approximately ten years since the first endorsement of MEM98. However as shortages of steel detailers became more apparent, industry dissatisfaction with this minimal coverage grew and MSA was approached on a sporadic basis by different enterprises and state steel detailing associations for greater coverage of steel detailing skills.

In February 2007 Manufacturing Skills Australia was approached by the Australian Steel Institute (ASI) with an offer to co-ordinate a national input and participation in the development of Training Package based qualifications in structural steel detailing. MSA accepted this offer and an industry based Steering Committee was formed chaired by an ASI senior officer. Richard Jenkins and Associates was also engaged at this time to undertake the research and development of the appropriate qualifications.

Meeting industry needs

Initial industry consultations indicated that there was significant industry interest in developing qualifications that could be used to attract young people into steel detailing as well as support training for people who were currently in employment but looking to change careers and train in steel detailing. It was decided that industry requirements could best be met through developing a structural steel detailing specialist stream in the existing Manufacturing Technology qualifications in the Manufacturing Training Package. This would allow training to be linked Technology Cadetships and to apply across all of MSA's coverage. This decision was supported by the Steering Committee, industry associations and the AMWU which is the relevant union.

The new units and qualifications have full support of the industry. During the course of development, pre-existing State based Steel Detailing Institutes combined to form a national federation called the Australian Institute of Steel Detailing. The AISD and all State Institutes have indicated support for the draft specialist stream and units of competence.   The development of the new specialist stream is also consistent with the MSA aim identified in the MSA Environmental Scan to to lift overall educational achievement levels in areas of MSA coverage.

Development has drawn on the experience and expertise of the Australian Steel Institute, industry and RTOs to make sure that the proposed specialist stream will meet training and assessment requirements well into the future.

Project management

The project was managed by Manufacturing Skills Australia and overseen by a seven person industry based Steering Committee. Apart from an ASI nominee, other members represented industry in NSW, Victoria and Tasmania, South Australia, Queensland, and Western Australia.

The Steering Committee's functions were to:

- oversee and advise on consultation processes
- provide advice on underpinning knowledge and technical content

- act as a technical advisory group in the development of new units of competency
- assist with the resolution of any issues.

The Steering Committee members are listed below.

Name	Organisation	Representing
Peter Hisco (Chair)	Fiddlistics Pty. Ltd.	Victorian Institute of Steel Detailers
Chris Velovski	EDC. Pty. Ltd.	NSW Institute of Steel Detailers
Clayton Roxborough	SteelCad Drafting Pty. Ltd.	Queensland Institute of Steel Detailers
Neil Creek	Australian Steel Institute	Australian Steel Institute
James Galdes	Ironworks Steel Detailing	Victorian Institute of Steel Detailers
John Lyons	PDC Consultants	WA Association of Engineering Drafting Services
Greg Hammer	Australian Steel Detailers	Association of Independent Structural Draftsmen of SA

Consultation and validation processes

Consultations were undertaken nationally, involving face to face meetings, targeted email distribution of drafts to stakeholders (including members of the State industry associations, the AMWU, RTOs, State/Territory ITBs, STAs and individual enterprises) and wider distribution via the MSA website and the MSkills email update. Individual consultations with both enterprises were also conducted to confirm content and approach. Consultations were also undertaken with a range of RTOs in each State that were considered likely to be interested in delivery of structural steel detailing. While all RTOs consulted were supportive of the drafts, because of the small and highly specialised nature of structural steel detailing not all were interested in delivery.

Following a period of public comment, final drafts were developed, distributed by email and made available for a sign-off period on the MSA website. The qualifications and units of competency now being submitted have the full support of industry and interested RTOs.

Many people made time from their work commitments to participate in this project especially the members of the Steering Committee and John Leworthy from the VISD who also provided technical input. Without their expertise and input, the project would not have been able to achieve its objectives and this is gratefully acknowledged.

Structural steel detailing – consultation list

Development of the structural steel detailing specialist stream and associated units of competency involved substantial industry and RTO contributions. This included input from the following people.

Name	Organisation
Peter Hisco (Chair)	Fiddlistics Pty. Ltd.
Chris Velovski	EDC. Pty. Ltd.
Clayton Roxborough	SteelCad Drafting Pty. Ltd.
Neil Creek	Australian Steel Institute
James Galdes	Ironworks Steel Detailing
John Lyons	PDC Consultants
Greg Hammer	Australian Steel Detailers
Ian Curry	AMWU
Anne Donellan	AMWU
Ian Anderson	RMB Metalwork
Ian Cairns	Australian Steel Institute
Lorraine Conetta	Bayside Drafting
David White	Box Hill Institute
John Leworthy	Steelcode Detailing
Dean Beaumont	Global Drafting Corporation
Stuart Mattingley	Box Hill Institute
Ricky Hains	PlanIT Design
John Neal	Warradale Drafting Service P/L
Philip Scrivener	Scrivener Drafting Australia Pty Ltd
Norm Batterham	NB Drafting

Name	Organisation
Craig Beams,	Beamarr Structural Steel Detailing Pty Ltd
John Robinson	Sole trader WA
Mark Selby	Amalgamated Drafting
Terry Bownes	Amalgamated Drafting
Fraser Nelson	MECAT Curriculum Centre. NSW TAFE
Stephen Davies	MECAT Curriculum Centre NSW TAFE
Klaus Bienert	Box Hill Institute of TAFE
Glen Miller	GFC Industries Pty Ltd (Steel Fabricator)
Greg Schofield	Greg Schofield & Associates
Basil Morin	Global Drafting corporation
Robert Squires	TAFE Tasmania
Ian McDonald	Challenger TAFE
Greg Guppy	Challenger TAFE
Werner Lausberg	Adelaide North Institute of TAFE
Emmanuel Evangelidis	Victoria University
David Zanich	Central TAFE
Phil Grafton	Siegraft Drafting

The final drafts of the new units and qualifications were validated and signed off by all major stakeholders (both industry and RTOs) with no outstanding or unresolved issues. Validation and acceptance of final drafts was undertaken by email.

Formal support (letters/emails) has been provided by:

- AMWU
- Robert Squires TAFE Tasmania
- MECAT NSW TAFE
- Victoria University
- Klaus Bienert CMM Victoria
- Challenger TAFE

- Australian Institute of Steel Detailers
- Queensland Institute of Steel Detailing
- NSW Institute of Steel Detailing
- Victorian Institute of Steel Detailing (The Victorian Institute also covers steel detailers working in Tasmania)
- Association of Independent Structural Draftsmen of SA
- WA Association of Engineering Drafting Services
- Australian Steel Institute
-

Appendix 6: Competitive Manufacturing Vocational Graduate qualifications

Development of Competitive Manufacturing Vocational Graduate qualifications

The need for development of Vocational Graduate qualifications in Competitive Manufacturing was identified by MSA in 2007 in response to requests for more in depth training and professional development for individuals who already had some skills or training in Competitive Manufacturing practices. MSA appointed Richard Jenkins & Associates to undertake the development of the qualifications with the project commencing in April 2007.

The MSA decision to provide professional development as the target approach for the graduate qualifications meant that it was also appropriate to shift the skill level of the new units of competency further towards the leading edge of competitive manufacturing practice. Identifying this leading edge was undertaken through desk research, individual consultation with enterprises and through a full day workshop with senior industry practitioners and one RTO representative who had very recent senior management experience in private industry in lean manufacturing.

The desk research and the industry workshop identified that the skills focus in the vocational graduate qualifications should not be on providing initial training in the competitive manufacturing "tools" such as Just in Time, 5S, preventative maintenance etc, whether at implementation (AQF III/IV) or initial system design (AQF V /VI). It was felt that these skills were already adequately covered in the existing Competitive Manufacturing qualifications. Rather it was felt that the emphasis should be on providing the skills for a practitioner to assist an enterprise to take existing competitive manufacturing systems to even higher levels of performance. This approach was seen to be consistent with:

- the professional development philosophy established by MSA for the Vocational Graduate qualifications in Competitive Manufacturing; and with
- industry need for the highest level of skills required to take existing enterprise performance to higher levels to address intractable problems.

Based on the advice of the workshop participants it was decided that the emphasis in the Vocational Graduate qualifications should be mostly focused in two areas:

- skills associated with improving workplace understanding and implementation of competitive manufacturing practices;

- skills associated with improving the performance of a value chain as distinct from a focus just within an enterprise.

The above approach was confirmed during both rounds of consultations with no dissenting views being received.

Industry priorities addressed in the new components of the MSA07 Training Package Training Package are to provide additional development of skills and knowledge in competitive manufacturing practices for individuals who have prior training or industry experience in competitive manufacturing. This need for additional skill is usually apparent after an enterprise has completed initial implementation of a competitive manufacturing system such as lean manufacturing and needs to progress implantation of the system to a higher level of performance beyond that achieved from the initial implementation.

The development of the Vocational Graduate Competitive Manufacturing qualifications also is also a response to industry advice that not all needs for increased competency in competitive manufacturing skills is related to promotion of an individual to a position of increased responsibility. As stated in the previous paragraph the demand for increased skill and knowledge can also be related to the stage of an enterprise's implementation of a competitive manufacturing system

The Vocational Graduate Competitive Manufacturing qualifications also meet the industry need for in depth competitive manufacturing training in skills associated with establishing workforce understanding and participation in competitive manufacturing and for advanced value chain skills.

Meeting industry needs

The existing Competitive Manufacturing qualifications as they provide formal training and recognition for skills that have long been implemented in industry under various manufacturing practice approaches such as lean manufacturing, agile manufacturing, six sigma, total productive maintenance, etc. The current qualifications cover competitive manufacturing skills across the AQF II – AQF VI range and target training for operators, tradespersons, technicians, team leaders, supervisors and managers.

As implementation of the current qualifications proceeded it became recognised that while they provided a pathway for skills development to match promotion through a supervisory pathway, they did not provide as good an opportunity for someone who was already familiar with competitive manufacturing and who wanted to increase their skills and knowledge from their current level without changing their position within the enterprise.

The qualifications now being submitted for endorsement meet this need. They also meet the need of industry in that the early gains made from the implementation of competitive manufacturing practices are often the "low hanging fruit" of obvious errors and waste, and greater skill and knowledge is needed to sustain early gains and to achieve even higher performance levels.

Specifically based on the advice of the workshop and consultations, industry needs identified and addressed in this project focused on the following key skill areas:

- culture
    - achieving a consistent approach to all of the business (i.e. the value chain)
    - problem recognition and resolution (including the customer's problems)
    - establishing a learning organisation
- relationships
    - internal relationships with employees e.g. trust, consensus decision making
    - external relationships with value chain members
    - developing the capability of people

The new components presented for endorsement have been developed and validated extensively with industry and RTO representatives. This includes representation from enterprises, industry associations, unions, and RTOs from around Australia.

Project management

Because this project has application across all of manufacturing it was directly overseen by the MSA Board. Advice from an industry technical advisory group made up of technical experts in competitive manufacturing practices was also sought at different stages.

The individuals and enterprises/organisations represented on the MSA Board are set out in the following table:

Name	**Enterprise/Organisation**
Megan Lilly	Associate Director, Education & Training Australian Industry Group
Ian Curry	National Projects Officer Australian Manufacturing Workers Union
Sam Wood	National Vice President Australian Workers Union
David Graham	Operations Learning & Development Manager Huntsman Chemical Co Australia Ltd
Doug Stevens	Central Branch Secretary National Union of Workers
Michael Brown	General Manager, Heavy Maintenance Qantas Airways
David Hoare	General Manager Sealy of Australia

Michael Grogan	Chief Executive Officer Sutton Tools Pty Ltd
Michael O'Neill	National Secretary TCFU
Jo-Ann Kellock	Executive Director TFIA
Les Chegwidden	Manager Human Resources Viridian CSR

Consultation and validation processes

This project was conducted in two stages.   An initial investigation stage was conducted to examine current research and Training Package components and included the initial scoping workshop. This was followed by an implementation stage involving widespread consultation and industry visits, development and validation of two drafts and preparation of a final draft for endorsement.

Consultations were undertaken nationally and involved face to face meetings and targeted email distribution of drafts to enterprises, industry associations, unions, RTOs, State/Territory ITABs, and STAs. Wider distribution was achieved via the MSA website and their regular email newsletter.

Following each period of public comment, amendments were made and drafts circulated for acceptance.

The following people were involved in the development process and the value of their expertise and input is gratefully acknowledged.

Name	**Organisation**
Keith Cowlishaw	Ex - General Manager Rocklea Spinning Mills Currently Head of School of Fashion and Textiles RMIT Melbourne
Professor David Ben-Tovim	Flinders Medical Centre
Dr. Ross Bensley	Organisation Development Manager Schefenacker Vision Systems Australia

Name	Organisation
David Hind	Retired CEO, BOC Australia & Chair of Skills Tasmania
Aimee Allen	President - Strip and Plate, Port Kembla Steelworks Bluescope Steel
Rod Snashall	Slabmaking Process Control Manager, Port Kembla Steelworks Bluescope Steel
Michael Brown	General Manager, Heavy Maintenance and Technical Training QANTAS (Melbourne)
Jorge Marquesini	CEO Volvo Trucks Australia
Barry McCarthy	Learning and Development, Toyota Australia
Tari Shabat	Toyota Australia
Ray Clark	Corporate Learning and Development Associate Ford Australia
Julie Eastman	Corporate Learning and Development Manager Ford Australia
Michael Grogan	CEO, Sutton Tools Australia
Anne Donellan	Technical, Supervisory and Administrative Division Australian Manufacturing Workers' Union
Ian Curry	Australian Manufacturing Workers' Union
Steve Gunn	CEO, Blundstone Australia Pty Ltd
David Hoare	General Manager, Sealy of Australia
Doug Stevens	Central Branch Secretary, National Union of Workers
Michael Littlechild	Automotive Training Australia
Anne Ford	TAFE NSW - Western Sydney Institute
David Tiller	Australian Industry Group
Bob Carter	General Manager, Improve group
Terry Richards	CEO, Australian College of Training

Name	Organisation
Joe Husidic	Wiseman Institute of Applied Learning
Allan McCracken	Forest Industries Training and Education Council (NZ)
Jennis Lawrence	Competenz New Zealand
Eric Salonen Richard Lindner	Manufacturing Skills QLD
Derek Cupp	Manufacturing Industry Skills Advisory Council (SA)
Jillian Dielesen	Light Manufacturing ITC (WA)
Archie Wright	MITAC (NT)
Les Hewett	Efficiency Works
Deb Doherty	Skills Tasmania
Steve Ghost	Skills Tech Australia (QLD)
Elizabeth Owers	DFEEST (SA)
Pauline Hart	MECAT TAFE NSW
David McCourt	TAFE NSW Riverina Institute
David Zanich	Central TAFE WA
Karen Humphreys	Hunter Institute of Technology (NSW)
Sandy Powell	Goulburn Ovens Institute of TAFE
Carlo de Martinis	Swinburne University – TAFE Division
Nick Proferes	TAFE SA
Kerry Dickson	TexSkill
Martin Lewis	FIAA Ltd.
Geoff Adams	QLD Department of Tourism, Regional Development and Industry
Paul Kennett	Manufacturing and Engineering Skills Advisory Board (MESAB) Victoria

Name	Organisation
Robert Miley	Department of Economic Development, Tasmania
Werner Lausberg	TAFE SA

Appendix 7:   MSA30309 Certificate III in Surface Coating Preparation and Application

Development of MSA30309 Certificate III in Surface Preparation and Coating Application

This new qualification meets an industry need to have qualified operators who can suitably prepare surfaces and apply the required protective coating. There currently exist qualifications for vehicle painters and painters and decorators, but there is no qualification in this sector for a job with arguably more technical requirements.

The CSIRO estimates the cost of corrosion in Australia to be around $13 billion per year. The major role for this sector is the control of corrosion and so, the reduction of this significant cost. Protective coatings need to be applied to much of public infrastructure (e.g. bridges, pipelines), some modes of transport (e.g. ships, submarines), and many large public and private structures (e.g. hydrocarbon, chemical plants, off shore oil/gas platforms). All these items need to have their surfaces prepared correctly before beginning to apply the appropriate coating. Time between preparation and application is often critical to the overall success of the final product. The industry sought an appropriate qualification to provide common and adequate base level skills across Australasia as a fundamental way of achieving better quality.

The increasingly technical nature of the protective coating and the need to undertake both adequate preparation and surface preparation safely and in an environmentally friendly manner has increased the need for this particular qualification. These technological advances have increased the life of the item, and the period between maintenance and the overall life. However, as surface preparation and coating becomes more technical, the ability to perform both correctly becomes more critical if the intended protection is to be achieved.

As much of this work is done 'on site' with routine only supervision, it is essential that the qualification equips the operator for this degree of independent operation.

Project management

MSA's Process Manufacturing Board Sub-committee oversaw the development process with significant technical assistance being provided by the Australasian Corrosion Association (ACA) Technical Coatings Technical Group (TCTG).

The individuals and enterprises/organisations represented on the Process Manufacturing Board Sub-committee are set out in the following table:

Name	Enterprise/organisation
Les Chegwidden, Chair replaced by David Graham	Pilkington/Veridian Glass Huntsman Chemicals
Bob Paton or Barbara Wallace	MSA CEO MSA QA Manager
Julie Keddie	MSA Industry Coordinator
John Maraz	MSA Industry Coordinator
Robert McRuvie	DTRDI, Queensland
Alexsander Stanojevic	AiGroup
Richard Lindner	MSQ
Heather Yerbury	Boral Concrete & Quarries Country (QLD/NT)
Dr. Geoffrey Will	School of Physical Sciences, Queensland University of Technology
Kerryn Caulfield	Composites Australia
Marina Williams/Sam Wood	AWU

Consultation and validation processes

Consultations during the development and validation process were undertaken with the ACA and with RTOs already working in the field or intending to offer this qualification.

The following individuals and organisations participated in the development process. The great value of their expertise and input is gratefully acknowledged.

Name		Organisation	State
Mark	Arundell	SkillsTech (TAFE)	Qld
Ron	Baker		WA
Fikry	Barouky	Saudi Aramco	
Ron	Berry	Altex Coatings Limited	NZ

Name		Organisation	State
Ben	Biddle	Wattyl Protective & Marine Coatings	Qld
Alan	Buckley	Technical Pacific Pty Ltd	NSW
Phillip	Coleman	TAFE NSW	NSW
John	Cooper	Prostrip	NSW
Geoff	Coward	McElligott Partners Pty Ltd	Vic
Bill	Doherty	TAFE NSW	NSW
Mark	Dromgool	KTA Tator	Vic
Warren	Easterbrook	Glendale TAFE	NSW
Jan	Evensen	Jotun Norway	
Sam	Formosa	TAFE NSW	NSW
Todd	Fotheringham	CTI Consultants Pty Ltd	NSW
Rob	Francis		
Ian	Glover	Corrotek	WA
Peter	Haberecht	MATENV	
Michael	Hambrook	APMF	NSW
Shannon	Heath		WA
Harold D	Hilton	Atlas MTT LLC	
Brian	Johnson	TAFE NSW	NSW
Jeremy	Knight	TAFE NSW	NSW
Kenneth	Lofhelm	PCCP	Vic
Willie	Mandeno	OPUS	NZ
Bill	McEwan	CTI Consultants Pty Ltd	NSW
John	Moffatt	Biolab Industrial	NZ
Roy	Orr	Peerless Industrial Systems	WA

Name		Organisation	State
Michael	Porter	Barry Bros	Vic
Ted	Riding	Jotun Australia	
Fred	Salome	CTI Consultants Pty Ltd	NSW
Washington	Sanchez	Biolab Industrial	NZ
Mark	Schilling	CPI	
Brad	Shaw	East Gippsland TAFE	Vic
Stuart	Smith	Melbourne Water	Vic
Ben	Solomon	Sunshine Powder Coatings	Qld
Ian	Squire	TAFE NSW	NSW
Nick	Subotsch	Peerless Industrial Systems	Vic
Morris	Thor	TAFE NSW	NSW
Ben	Veldhuis	TAFE NSW	NSW
Ian	Vickery	TAFE NSW	NSW
Kevin	Walker	EXITO	NZ
Dean	Wall	Australasian Corrosion Association	Tas
Geoff	White	Maunsell/AECOM	Qld
Heather	Yerbury	Boral Resources (Qld) Pty Ltd	Qld
Mark	Weston	Incospec & Assoc	SA
Derek	Cupp	MISAC	SA

In addition, Geoff White, Chair TCTG, ACA, presented the findings to the ACA annual conference. The list of recipients is not known to this project but the response was positive.

The final drafts of the new units and qualification have been validated and signed off by all major stakeholders (both industry and RTOs) with no outstanding or unresolved issues. Validation and acceptance of final drafts was undertaken by email. A separate face-to-face validation meeting was held with RTOs intending to offer this qualification (included in the list above), in particular to check on possible implementation issues. They also signed off with no unresolved issues.

Clear and full support for endorsement of the new qualification and units has been provided by all stakeholders.

Appendix 8: Trade Measurement units and Skill Sets

Development of Trade Measurement units and Skill Sets

Responsibility for Australia's trade measurement system is currently shared between the Commonwealth, States and Territories. By 2010, responsibility will transfer to the Commonwealth and in preparation for that, NMI wished to establish a nationally consistent training and skills recognition system that is competency based with qualifications (or Skill Sets) that align with the job roles of trade measurement and fair trading personnel. In particular they focused on the competency needs of Verifiers, Inspectors and Senior Inspectors.

MSA contracted Ivan Johnstone (CIT Solutions Pty Ltd) to undertake this work which included reviewing the suite of trade measurement units in MEM05. The eight MEM units in question (MEM15015-15022) are listed as specialist elective units within MEM40105 Certificate IV in Engineering. Research indicated they were not being used outside the Qld Office of Fair Trading regulatory environment, who have provided written support for the changes. The level of change proposed to the units to support the new regulatory environment that will be in place in 2010 was significant and resulted in development of 14 new units of competency.

The new units will not be aligned to any qualifications, but will be available for use in defined Skill Sets in MSA07 and for importation to proposed new qualifications under development by Government Skills Australia.

Project management

This development has been overseen by MSA's Laboratory Operations Board Sub-committee with significant technical assistance provided by NMI staff and committees.

The individuals and enterprises/organisations represented on the Board Sub-committee are set out in the following table:

Name	Enterprise/organisation
David Graham	Huntsman Chemicals
Duncan Jones	Science Industry Australia
Gail Silman	Ai Group
Ian Curry	AMWU
Kim Peterson	TAFE NSW
Marian Haire	National Measurement Institute
Bob Paton Barbara Wallace	MSA CEO MSA QA Manager

Consultation and validation

Consultations during the development and validation process were undertaken with the following key trade measurement personnel from all jurisdictions throughout Australia. The great value of their expertise and input is gratefully acknowledged.

Name		Organisation	State
Marion	Haire	National Measurement Institute (NMI) Sydney	NSW
Ian	Bentley	National Measurement Institute (NMI) Sydney	NSW
Mathew	Foot	National Measurement Institute (NMI) Sydney	NSW
Anne	Galvin	National Measurement Institute (NMI) Sydney	NSW
Ron	Begg	National Measurement Institute (NMI) Canberra	ACT
Darryl	Hines	Trade Measurement QLD, Fair Trading	QLD
Ron	Plummer	Trade Measurement & Standards, Justice	TAS
Les	Anderson	Trade Measurement	NT
Lindsay	Tegart	Trade Measurement, Fair Trading	NSW
Russell	Jackson	Trade Measurement, Consumer Affairs	VIC
Doug	Berry	Trading Standards Branch	WA
Tony	Blefari	Trade Measurement, Fair Trading	SA
Grant	Fuller	Trade Measurement, Fair Trading	ACT
Olga	Ford	Office of Fair Trading	NSW
Lynn	Greenwood	Government Skills Australia	SA

The final drafts of the new units and Skill Sets have been validated and signed off by all major stakeholders with no outstanding or unresolved issues. Validation and acceptance of final drafts was via a workshop and email.

Marian Haire (NMI's national Training and Technology Transfer Manager with responsibility for coordination of training and recognition/assessment using the new units and Skill Sets) has signed off with no unresolved issues.

Appendix 9:   Recreational Vehicle qualifications

Development of the Recreational Vehicle qualifications in MSA07v6

The recreational vehicle qualifications were originally included in THC99 under the Tourism and Hospitality National Industry Training Advisory Board. In 2004, the qualifications were revised, with minimal changes.

With the merger of national ITABs into the ten Industry Skills Councils, THC04 came under the jurisdiction of the Service Industries Skills Councils. As the needs of the recreational vehicle manufacture, service and repair sectors relate to manufacturing and engineering, the sector determined their qualification needs would be more appropriate under the coverage of the Manufacturing Industry Skills Council.

Manufacturing Skills Australia (MSA) undertook to review and update the qualifications and their associated units of competency to bring them into line with current industry needs and with similar manufacturing, service and repair qualifications.

Kevin Hummel of Total Training and Performance Solutions (TaPS) was commissioned to undertake a Scoping Study in 2009. The Scoping Study Report noted that:

- users of THC04 felt it was somewhat inflexible and thus causing some difficulties
- to increase flexibility job based units of competency should be replaced by skills based units of competency (and this may require an adjustment to the qualification packaging rules)
- where there are relevant units of competency which are used by other industry sectors, they should be used in preference to RV specific units covering the same area, unless there are RV specific contexts which they cannot meet
- units and skills sets covering restricted licence requirements should be imported where appropriate
- relevant Competitive Manufacturing units should be included as elective units, while still requiring a sufficient technical core.

MSA supported the findings and contracted TaPS to undertake the agreed changes. Further industry consultations were undertaken prior to developing a detailed specification for the new units of competence and new qualification.

Meeting industry needs

The major industry drivers for the improvements to this package are outlined below:

- RTOs currently servicing this sector support a restructuring of the qualification to make it more flexible and believe they can adapt their existing resources fairly readily. They also see a restructure as possibly making it easier to use suitable resources from other sectors.
- Industry supports increased access to training and resources and is concerned that a sufficient broad base of skills be maintained to allow for both flexibility in workforce deployment and also for portability of skills across the sector.

- This is a sector which is growing and which has wide regional coverage. It is highly concentrated in terms of manufacturing, but with a broad range of smaller manufacturers. Service and repair (and sales) tends to be many small and medium businesses, often with a formal relationship with a manufacturer. This does not prevent them from servicing/repairing any other RV.

Project management

The project was overseen by an MSA Board Sub-Committee made up of major stakeholders. The terms of reference were to:

- assist in the identification of stakeholders to be consulted for the project
- identify and assist in the resolution of industry issues in relation to strategic objectives of MSA's projects
- provide industry input and advice on:
  - industrial issues
  - training and assessment issues
  - priority areas for industry skills development
  - appropriate methods for collection, collation and consolidation of industry information
  - validity of the content of project outcomes
- provide feedback on MSA's development work undertaken for the area covered
- exchange information as appropriate between MSA, industry and other relevant professional groups covered
- provide feedback on the project development work for the area of interest
- make recommendations to the MSA Board on acceptance of the product of the project..

The individuals and enterprises/organisations represented on the MSA Board Sub-Committee are set out in the following table:

Name	Enterprise/organisation
Graham Attwood (Chair)	RMax
Kerryn Caulfield	Composites Australia
Richard Lindner	Manufacturing Skills Queensland
Alex Stanojevic	Ai Group
Heather Yerbury	Boral Concrete Products
Ian Booth	Australasian Corrosion Association
Sam Wood	AWU

Consultation and validation processes

Consultations during the development and validation process were undertaken with:

- technical experts from the relevant sub-sector or specialty area of expertise
- representatives of RTOs who already offer current qualifications and/or are intending to offer the qualification.

Consultation was largely by use of CAJA, face-to-face and email with expert input sought and obtained for the specific needs of the project.

Drafts of all units of competence and qualifications were then posted on the MSA website for validation and stakeholders were advised by email about how to access the site and provide feedback. This included industry stakeholders listed on the MSA database, State industry advisory bodies, and State Training Authorities.

This feedback was used to further refine the units and qualifications. In some cases, the feedback received and the units involved were reviewed again by technical experts prior to final editing.

The following individuals and organisations were involved in the development process. The great value of their expertise and input is gratefully acknowledged.

First Name	Second Name	Organisation	State
Maree	Saggers	7th St Caravans	NSW
Gary	Mitchell	ACR caravan repairs	NSW
Alan	Mcdonald	Aerodynamic developments	NSW
Jim	Massey`	Australian Motor Homes Pty Ltd	NSW
Rod	Payten	Camden Caravans	NSW
Jane	McCorkell	Caravan Camping Industry Association	NSW
David	Carlon	Carlon Caravans	NSW
The	Manager	Chapmans Coromal Caravans Nowra	NSW
Robert	Hare	CIL Insurances - Caravan Insurance Leaders	NSW
Narelle		Classic Caravan & Trailer Repairs	NSW
Brian	Fletcher	Classic Caravan and Trailer Repairs	NSW
The	Manager	Coromal Caravans Central Coast	NSW
Russell	Wood	Cub Campers	NSW

Cesar	Tabet	Dan's Caravans	NSW
Peter	Hands	Express Campers	NSW
Alison	Wood	Five Star Campers	NSW
Grant	Brierly	Frontline Campervans	NSW
Alan	Fulcher	Fulcher's Caravans	NSW
Igor	Muriti	I & D Industries	NSW
Peter	Blanshard	Institute of Automotive Mechanical Engineers	NSW
Damian	Charleson	Jayco Newcastle	NSW
David	Carrick	Jayco Sydney	NSW
Ian	Durance	Kimberley Kampers	NSW
Ron	Borton	Kimberly Kampers	NSW
Rick	Martin	Kimberly Kampers	NSW
Rod	Coles	Millard Caravans	NSW
Gary	Willer	Millard Caravans	NSW
Chris	Parish	MSA	NSW
The	Manager	Opalite Caravans	NSW
Stephen	Edwards	Parravans Caravan World	NSW
Mark	Fawcett	South Western Sydney Institute of TAFE, Wetherill Park College	NSW
Keith	Harrison	Suncamper	NSW
Mike	Rowe	Suncamper	NSW
Russell	Bale	SWSI TAFE	NSW
Thor	Morris	TAFE NSW SWSI	NSW
Rob	Surdonic	The Caravan Company Pty Ltd	NSW
Michael	Lord	Trakka Pty Ltd	NSW

David	Wallis	Trakka Pty Ltd	NSW
Deborah	Joyce	Transport and Logistics Industry Skills Council	NSW
Daryl	Buckingham	Ultimate Campers	NSW
Faye	Watson	Watson's Caravans & RVs Coffs Harbour	NSW
Kris	Watson	Watsons Caravans and RVs	NSW
Adam	Watson	Watsons Caravans Coffs Harbour	NSW
Shane	Martin	Watsons Caravans Port Macquarie	NSW
Glen	Anderson	Wetherill Park TAFE	NSW
Trevor	Smith	Wetherill Park TAFE	NSW
Bruce	Binns	Winnebago Industries	NSW
Jodie	Harris	Winnebago Industries	NSW
Barry	Baillie		NSW
Bob	Browne		NSW
Nicola	Burridge		NSW
Barry	Cramond	TEATAC (NT) Inc	NT
Paul	Bridge		Qld
Barry	Barker	Arrow Caravans and Towbars	Qld
Graham	Best	Best's Caravan Services	Qld
Greta	Best	Best's Caravan Services	Qld
Jim	Carnavas	Brisbane Camperland	Qld
Joshua	Carnavas	Brisbane Camperland - Jayco	Qld
Brendan	Saggers	Brisbane RV's	Qld
Merv	Flynn	Caravan Repair Centre	Qld
Garry	Bushell	Caravan Trade and Industries Association Queensland	Qld
Ron	Chapman	Caravanning Queensland	Qld

Mark	Glencross	City Caravan Centre	Qld
The	Manager	Classic RTM	Qld
Bill	Connor	Coromal Caravans Sunshine Coast	Qld
Warren	Wheelock	Coromal Caravans Sunshine Coast	Qld
Nick	Oliver	Cutloose RV	Qld
Brett	Wright	CVIAQ	Qld
Kirk	Straughen	Department of Transport and Main Roads	Qld
The	Manager	Desert Edge Trailers	Qld
The	Manager	Dreamland Trailers	Qld
The	Manager	Dryden Trailers	Qld
Paul	Dawes	Gold Coast Caravan Sales	Qld
The	Manager	Golf Caravans	Qld
Stewart	Cameron	Hinterland Outdoors	Qld
Brendan	Kerr	Jayco Townsville	Qld
The	Manager	Kamparoo	Qld
Jan	McNeil	Kedron Caravans	Qld
Gary	Kratzmann	Kratzmann Caravans	Qld
Greg	Wetkin	Lifestyle RVs	Qld
Ken	Vaughan	Limit Seeker Camper Trailers	Qld
Erik	Salonen	Manufacturing Skills Qld	Qld
Gary	Smiley	Manufacturing Skills Queensland	Qld
Brendon	Beckett	Morayfield State High School	Qld
The	Manager	Paradise Motorhomes	Qld
Kevin	Bluhdorn	Skills Tech Australia	Qld
Peter	Donaldson	Skills Tech Australia	Qld

Gordon	Elledge	Skills Tech Australia	Qld
Scott	Ovenden	Skills Tech Australia	Qld
Trevor	Scott	Skills Tech Australia	Qld
The	Manager	Sunland Caravans	Qld
Jeffrey	Hockam	Sunshine Coast Institute of TAFE	Qld
Bede	O'Brien	Sunshine Coast TAFE	Qld
The	Manager	Swagman Motorhomes	Qld
The	Manager	Tavlor Motorhomes	Qld
Michael	Ritzau	Adventura Caravans	SA
Frank	Tabone	Adventure Campers	SA
Stuart	Livingstone	CCIA SA	SA
Gareth	Handshin	Challenge Campertrailers	SA
Dario	Priori	Dario Caravans	SA
Chris	Barrett	Dario Caravans and Repairs	SA
Cheryl	Bald	DFEEST	SA
Leonie	Cooke	DFEEST	SA
Sherelee	Rose	DFEEST	SA
Rob	Heaslip	Heaslip Campers	SA
Derek	Cupp	Manufacturing Industry Skills Advisory Council	SA
Mike	Griggs	Mike Griggs Caravan Service Centre	SA
Rhonda	Tunks	MISAC (Manufacturing Industry Skills Advisory Council SA Inc)	SA
Renae	Balckshaw	TAFE SA	SA
Anna	Papzoglov	TAFE SA	SA
Ron	Williams	TAFEsa	SA

Margaret	Collings	tafeSA Noarlunga Campus	SA
Anne	Urquhart	AMWU	Tas
The	Manager	Caravan Industry Australia (Tasmania)	Tas
Phillip	Canning	Discovery Holiday Park Strahan	Tas
Danny	Gower	Island Motor Camper Conversions	Tas
David	O'Byrne	Liquor, Hospitality and Miscellaneous Union	Tas
Debra	Doherty	Skills Tasmania	Tas
Tim	McLaren	Stanley Caravan and Tourist Park	Tas
The	Manager	Tasmania National Parks Association	Tas
David	Gutteridge	Tasmanian Polytechnic	Tas
Rod	Mason	Tasmanian Skills Institute	Tas
Frank	Hussey	Tourism Tasmania	Tas
Stephen	Farley	Treasure Island Caravan Parks	Tas
Ken	Dorsey	Workforce Development	Tas
Trevor	Eastman		Vic
Mark		Aussie Wide Caravans	Vic
Greg	Walsh	Automotive Training Victoria	Vic
Darren	French	Avan Caravans	Vic
The	Manager	Billabong Custom Caravans	Vic
Peter	Wright	Caravan Industry Assoc. Victorian Trades Division	Vic
The	Manager	Caria Caravans	Vic
Andre		Chisholm TAFE	Vic
Noel	Sutcliffe	Chisholm TAFE	Vic
Ron	Wylde	Chisholm TAFE	Vic
The	Manager	Concept Caravans	Vic

The	Manager	Davsher Campers and Caravans	Vic
The	Manager	Designer Vans	Vic
Luke	Behncke	DIIRD	Vic
The	Manager	Dreamhaven Caravans	Vic
The	Manager	Driftaway Caravans	Vic
The	Manager	Eagle Caravans	Vic
Darren	French	Evernew Caravans	Vic
Neville	Watson	Ford Motor Company of Australia	Vic
The	Manager	Galaxy Caravans	Vic
The	Manager	Goldstream RV	Vic
Chris	Riley	Jayco	Vic
Daniel	McDonald	Jayco (training)	Vic
The	Manager	Jurgens Caravans	Vic
Diana	McGowan	Kangan Institute of TAFE	Vic
Phil	Murphy	Kangan Institute of TAFE	Vic
Vince	Panozzo	Kangan Institute of TAFE	Vic
Bill	Reece	Kangan Institute of TAFE	Vic
Wayne	Walter	Kangan Institute of TAFE	Vic
The	Manager	Kingdom Caravans	Vic
The	Manager	La Vista Caravans	Vic
Michael	Waterson	Lumen Australia	Vic
The	Manager	Majestic Caravans	Vic
Alex	Bernhardt	Manufacturing and Engineering Skills Advisory Body (MESAB)	Vic
Peter	May	May West Caravans	Vic

Gordon	Wilson	May West Caravans	Vic
The	Manager	Montana Caravans	Vic
Gerry	van Oosterom	NMIT Epping Campus	Vic
Ian	Roberts	NMIT, Building & Construction	Vic
The	Manager	Nova Caravans	Vic
The	Manager	Olympic Caravans	Vic
The	Manager	Paramount Caravans	Vic
Colin	Young	Recreational Vehicle Manufacturers Association of Australia Inc.	Vic
The	Manager	Regal Caravans	Vic
Mary	Holmes	Resource Education and Training Pty Ltd	Vic
Faye	Milroy	Resource Education and Training Pty Ltd	Vic
The	Manager	Retreat Caravans	Vic
The	Manager	Roadstar Caravans Pty.Ltd.	Vic
The	Manager	Roma Caravans	Vic
The	Manager	Royal Flair	Vic
Robert	Funda	RVMAA	Vic
The	Manager	Spaceland Industries	Vic
Phil	Savory	Stockman Products	Vic
The	Manager	Sunliner Recreational Vehicles	Vic
Joe	Markovich	Supreme Caravans	Vic
The	Manager	Track Trailer	Vic
The	Manager	Trailblazers RV	Vic
The	Manager	Trakmaster	Vic
The	Manager	Traveller Caravans	Vic

The	Manager	Truelux 5th Wheel	Vic
John	Kyriakidis	Vanguard Caravans	Vic
Helen	Constanza	Windsor Caravans	Vic
The	Manager	Wirr-away Motorhomes	Vic
Peter	Hancock	Workplace Learning Initiatives	Vic
Stuart	Loly	Workplace Learning Initiatives	Vic
The	Manager	A1 Caravans	WA
The	Manager	Caravan and RVs Superstore	WA
The	Manager	Caravanland	WA
Pat	Strahan	Combined Industry Associations	WA
Lubor	Hebik	Coromal Caravans	WA
Ida	Yee	Coromal Caravans	WA
Brad	van Hement	Coronel	WA
David	Hill	Elross Caravans	WA
Dave	Hicks	Engineering and Automotive Training Council Inc (EATC)	WA
Mark	Harper	Engineering and Automotive Training Council Inc (WA)	WA
The	Manager	Freedom caravans	WA
The	Manager	George Day Caravans	WA
Lyle	Barrett	IAME	WA
The	Manager	Mandurah Caravan & RV Centre	WA
Dennis	Baker	Polytechnic West	WA
Colin	Russell	Swan TAFE	WA
The	Manager	Trailstar Caravans	WA

Clear and full support for endorsement of the revised Training Package has been provided by all industry and RTO stakeholders.