About the Welding Technology Institute of Australia (WTIA)

A membership-based organisation, the Welding Technology Institute of Australia (WTIA) represents Australia’s welding profession. Our primary goal is to ensure that the Australian welding industry remains locally and globally competitive, now and into the future. WTIA is the Australian representative of the International Institute of Welding (IIW).
A Message From
The WTIA CEO

The WTIA has enjoyed a successful, stable 2017. This year saw us foster several important collaborative relationships with industry leading organisations, from DMTC and Navantia, through to the Italian Institute of Welding, the Australian Steel Institute, the Defence Teaming Centre and the Advanced Manufacturing Growth Centre. We also worked closely with TAFEs and state governments in order to establish Advanced Welder Training Centres across the nation.

After a period of significant change within the organisation, this year has been relatively stable for the WTIA.

I am really pleased with the way the entire WTIA team has performed this year; their energy, enthusiasm and commitment to the WTIA and its members has been outstanding.

At the beginning of the year, I was fortunate enough to be able to recruit Alistair Forbes as our Technology Operations Manager. Alistair’s appointment has been enormously beneficial to the WTIA. It has enabled me to focus on promoting the WTIA to both government and industry.

I have also been extremely happy with the appointment of Paolo Corronca as our Lead Auditor for ISO 3834 certification, as well as the enthusiasm that our two new graduates Adam Coorey (Technology Graduate) and Arya Sharifian (Qualification Certification Graduate) have brought to the business.

The appointments of Julie Fidler as our new Commercial Manager, and Melissa Odendaal as our first Welding Consultant have also been very beneficial, with both Julie and Melissa fitting into the team wonderfully and doing a great job.

I’d like to thank the WTIA President Roger Griffith and Deputy President David Lake (Managing Director, ATTAR) and the rest of the WTIA Council for all their support and hard work during the year. As your representatives, they play a crucial role in directing the efforts of WTIA management and staff, without which we would not be able to function.

I am pleased to report that our shared services arrangement with the Australian Steel Institute (ASI) has gone from strength to strength throughout 2017. The collaborative working relationship that the two organisations have been able to engender this year has resulted in significant benefits for both the WTIA and the ASI.

Whilst on the theme of collaboration, 2017 saw the WTIA sign several Memorandums of Understanding (MoUs) with like-minded organisations, including DMTC, the Italian Institute of Welding, and defence shipbuilding prime Navantia.

We have also worked closely with a myriad of other innovative industry organisations this year. In particular, I would like to thank Margot Forster (Chief Executive Officer, Defence Teaming Centre) and Dr Jens Goennemann (Managing Director, Advanced Manufacturing Growth Centre) for their ongoing support and assistance.

This year, much of my focus has been dedicated to lobbying the state governments in order to secure funding for Advanced Welder Training Centres across the nation.

Welder training has not changed substantially since 1925 when it was first introduced into Australia. As such, the WTIA is committed to introducing cutting-edge training technology (such as robotics, lasers and augmented reality) into Australia in order to give our students the best and most cost effective training available anywhere in the world.

We have been very fortunate to have the support of the Victorian Government for the Advanced Welder
Training Centres; I am chairing a steering committee for the Victorian Skills Commissioner. This steering committee has been charged with developing an accredited course (which will be taught at the Advanced Welder Training Centres) to train experienced welders and transitional workers in line with ISO9606.

In this endeavour, particular thanks must go to George Adda (Supervising Executive Officer – Curriculum Maintenance Manager, Engineering Industries, Box Hill Institute), Cameron Baker (Director, Victorian Skills Commissioner), and the members of the steering committee who have all worked tirelessly, including Rob Vernon, Louis Victor Blain (Lead Welding Engineer at Bombardier), Phill Stubbington (National Welding Engineer at Lincoln Electric Australia), Robert Wiseman and Malcolm Rigby.

I would also like to thank all the TAFEs across Australia. Their support and collaboration have been wonderful, particularly that of Brian Rungie (Executive Director Education, TAFE SA), Penny Johnston (Director Defence Industries, TAFE SA), Peter Buttenshaw (Head Teacher Engineering Trades, TAFE NSW Illawarra Institute), and Michael Pitt (Assistant Faculty Director Trades and Technology, TAFE NSW Illawarra Institute).

This year we instigated a program of reinvigoration throughout the state divisions. After attending all the end of year functions, I am particularly encouraged at the level of enthusiasm and commitment shown by committee members and key supporters. Whilst we have come a long way, I still think there is much more that the WTIA can do for members at a local level.

In 2018, we will be investigating additional help that the WTIA head office can provide to support local members in the very important work that is undertaken at a state level.

I’d like to remind our members and clients that the WTIA office will be closed over Christmas and the New Year, from Thursday 21 December 2017, returning on Monday 8 January 2018.

Lastly, on behalf of the WTIA, I’d like to thank our members and clients for their continued support in 2017, extend our warmest wishes for the holiday season, and wish everyone a safe and prosperous new year.

I am looking forward to 2018, and am confident that it will be a highly successful year for both the WTIA and its members.
ASC Prepares to Deliver Naval Shipbuilding Plan

Australia's submarine sustainment and major warship builder, ASC, welcomed the Naval Shipbuilding Plan announced by Prime Minister Malcolm Turnbull early this year. With ASC meeting international benchmarks in warship construction and submarine sustainment, the company is looking forward to playing a significant role in the future of the sector, implementing a number of measures in preparation to deliver the Plan.

In April, ASC announced a partnership with Perth-based Forgacs Marine & Defence (owned by Civmec Construction and Engineering) to offer a low risk, commercial shipbuilding solution for the Offshore Patrol Vessel program. ASC confirmed that international ship designers, Damen of the Netherlands and Lürssen of Germany, had both selected ASC and Forgacs as their preferred partners for the Offshore Patrol Vessel program, should either company win the tender.

In June, ASC announced another partnership, this time with Austal, for the construction of the SEA5000 Future Frigates Program. The $35 billion Future Frigate Program will deliver replacement vessels for the existing ANZAC fleet with production scheduled to commence from 2020 at the Federal Government-owned shipyard in Osborne, South Australia. The Program will secure the future of naval shipbuilding in Australia for decades to come. Under the arrangement, ASC and Austal will act as one in support of the program, pooling their complementary strengths, skills and experience.

“The Austal-ASC Shipbuilding teaming arrangement offers a compelling, low risk, Australian shipbuilding solution for each of the three shortlisted international designers; BAE, Fincantieri and Navantia,” the then Austal CEO, David Singleton said.

ASC also opened an innovative major upgrade to their Western Australian submarine maintenance facility. The upgrade is part of ASC’s continuous improvement of the maintenance of Australia’s Collins Class submarine fleet. The $12.5 million redevelopment will improve productivity and reliability through a maintenance support tower, sky bridge and new amenities and office areas, significantly cutting the time workers spend accessing a submarine under maintenance.

The redevelopment comes after ASC and the Defence Department agreed a further five year performance period for the sustainment of the Collins Class submarine fleet, which commenced on 1 July this year.

Chevron Produces LNG at Wheatstone

In early October, Chevron Australia announced that it had started producing liquefied natural gas (LNG) at the Wheatstone Project in Western Australia, with the first cargo on track to be shipped by early November.

WTIA member CB&I provided a range of engineering, procurement and construction services for the project, including: installation and hook-up of 11 domestic gas unit modules; interconnection of 5,500 tonnes of module structural steel and erection of all stick-built structural steel; installation of a 1,100mm diametre, 1,200m long feed gas pipeline; and more.

“First LNG production is a significant milestone and is a credit to our partners, contractors and the many thousands of people who collaborated to deliver this legacy asset,” said Chevron Chairman and CEO John Watson. “Wheatstone adds to our legacy gas position in Australia that will be a significant cash generator for decades to come.”

The Wheatstone Project is one of Australia’s largest resource projects. Located at Ashburton North, 12km west of Onslow, the project consists of two LNG trains with a combined capacity of 8.9 million tonnes per annum and a domestic gas plant. The Wheatstone Project is a joint venture between Australian subsidiaries of Chevron, Apache Corporation, Kuwait Foreign Petroleum Exploration Company, Shell, Kyushu Electric Power Company, and PE Wheatstone.
Bombardier Achieves Accreditation to Certify Welders for Australia’s Rail Industry

In June, Bombardier Transportation in Australia received accreditation from the Welding Technology Institute of Australia (WTIA), enabling the company to certify welders across the Australian rail industry through the Australian Welder Certification Register (AWCR).

The Welding Training Centre at Bombardier’s Dandenong site in Victoria is now an accredited facility for securing and growing local welding capabilities and for delivering industry-recognised certifications to staff, external suppliers, and industry partners in Australia.

“Our Welding Centre in Dandenong will act as a facility to train and certify welders; internally as well as externally with the capability to qualify suppliers, customers or any individual candidates. We want to enhance and sustain the Australian rail sector’s welding competencies”, said David Collomb, Bombardier’s Head of Operations and Site General Manager (Dandenong).

“This achievement is testimony to Bombardier’s continuous improvement and employee upskilling culture, which is a key differentiator of Bombardier’s quality products and customer offerings across the rail industry in Australia.”

As part of achieving this accreditation, the Welding Team in Dandenong validated Bombardier’s welding practices in line with the rigorous ISO9606 international weld requirements. During this process, Lead Weld Engineers, Louis Victor Blain and Con Sakellaridis, became accredited examiner and trainer respectively, and have worked tirelessly to demonstrate Bombardier’s welding competencies as part of manufacturing best practice.

Bombardier is now offering welding courses for internal and external candidates covering the EN15085 requirements specific to the rail industry. To date, the facility has trained and qualified over 40 Bombardier welders in addition to a number of key supply partners.

With more than 1,000 employees spread across every state, Bombardier Transportation has enjoyed a 60+ year presence in Australia as a complete rail solution provider.

Boasting local design, engineering, manufacturing and delivery capabilities, Bombardier also provides solutions for signalling, propulsion and control technology, asset management and through-life support to all customers.

Funding and Infrastructure Boost for ANSTO’s Australian Synchrotron

ANSTO secured $80.2 million in new funding this year, which will be used to expand the research capabilities of the Australian Synchrotron.

The funding boost was made by the New Zealand Synchrotron Group (representing funding from the New Zealand Government and 10 New Zealand universities and research institutions), the Defence Science and Technology Group and 19 universities and medical research institutes across Australia.

The new funding will expand the number of beamlines at the Synchrotron from 10 to as many as 18, increasing research output at the facility and helping keep up with significant researcher demand for the state-of-the-art facility.

The first stage of the expansion will see the construction of the Micro-computed Tomography (MCT) beamline and the Medium Energy XAS (MEX) beamline. These beamlines will be closely followed by a Small Angle X-ray Scattering (BioSAXS) beamline.
The WTIA presents Milspec with ISO 3834 certification.

Milspec Awarded ISO 3834 Certification

Milspec was awarded ISO 3834 certification by the WTIA in July. Established over 40 years ago, Milspec is a premier designer and manufacturer of brushless alternators and portable power systems for defence forces across the world.

Based in Albury, Victoria, and boasting 100% in-house and end-to-end manufacturing capabilities, Milspec partners with major global defence contractors such as Rheinmetall, BAE Systems and Thales.

WestConnex Employees Become the First Welders Registered on the AWCR

WestConnex (the New South Wales Government body responsible for upgrading and building new motorways in Sydney) determined that all welders undertaking repairs on a Tunnel Boring Machine (TBM) needed training and certification in prequalified welding procedures. These TBMs are being used as part of construction activities on both the M4 East and the New M5 projects.

A three day training and certification package was developed and delivered by the WTIA and TAFE NSW at Lincoln Electric Company's facilities in Padstow. Significantly, this training resulted in the welders being the first to be registered on the WTIA’s Australian Welder Certification Register (AWCR) in February.

Griffen Mallows Wins WTIA Prize for Innovation

Griffen Mallows was awarded the 2017 WTIA Prize for Innovation. This prize is awarded in the School of Civil and Environmental Engineering at the University of New South Wales. Griffen was recognised for achieving the best mark in the subject ‘Steel Structures’.

Austal Forges Ahead With Pacific Patrol Boat Replacement Project

Austal was awarded the A$306 million Pacific Patrol Boat (PPB) contract in May 2016. The project comprises the design, construction, delivery, training and sustainment of nineteen 39.5m patrol boats, which will be gifted by the Australian Government to twelve Pacific Island nations as part of the Pacific Maritime Security Program.

In March, Austal opened a new 10,500m² PPB Replacement Shipbuilding Facility in Naval Base, Western Australia and heralded the commencement of Austal’s steel naval shipbuilding capability. Construction of the Austal design commenced at this new facility from late April, with deliveries scheduled from 2018 to 2023. Sustainment of the new fleet of vessels will be carried out by Austal from facilities in Cairns, Queensland.

Wade Holz Wins Fourth Year Apprentice Award

Wade was awarded the First Place 4th Year Apprentice in Engineering at TAFE NSW, Illawarra Institute. This award is given to students undertaking postgraduate study who have already finished an apprenticeship in their chosen trade, and decided to return to further study at TAFE. Wade is studying a Certificate IV in Engineering, focused primarily on pressure vessel welding. The WTIA is a proud sponsor of this award.
Furphy Wins WTIA 2017 Fabricator of the Year Award

Furphy Engineering received the WTIA 2017 Fabricator of the Year Award. The award recognised Furphy's outstanding performance in market success, health and safety record, quality assurance, community engagement, demonstrated innovation and commitment to the training and development of employees. The award was presented to Furphy Engineering at the Gala Dinner of the Australian Steel Convention in September.

Adam Furphy, Furphy’s Managing Director said, “On behalf of the fantastic team here at Furphy Engineering I would like to thank the Welding Technology Institute of Australia and acknowledge their excellent work in representing Australian manufacturing and industry.”

“Manufacturing and servicing of stainless steel tanks has welding at its very heart and we are proud of our investment in both machinery and skills to continue to improve Australia’s stainless steel liquid storage. Many thanks for this wonderful award.”

Established in 1864 and operated from its base in Shepparton, Victoria, J. Furphy & Sons is an Australian engineering icon. The company is renowned for its historical links to rural Australia and its most famous product - the Furphy Water Cart. Today, the company manufactures high quality stainless steel storage tanks, processing tanks and pressure vessels.

Precision Metal Group Australia Awarded ISO 3834 Certification

Precision Metal Group was awarded ISO 3834 certification by the WTIA in October. A family owned and run mechanical and electrical engineering services company, Precision Metal Group has over 50 years of industry experience. The company provides a range of services, including forming, rolling, cutting, machining, metal fabrication and testing.

Bisalloy Joins Forces with Rheinmetall

In August, Bisalloy Steel Group announced the establishment of a teaming agreement with Rheinmetall Defence Australia for the development and production of high performance armour steel for both the Commonwealth of Australia’s Land 400 Phase 2 program and other global customers for Rheinmetall’s range of protected military vehicles.

With an estimated cost of $14 to $20 billion for acquisition, Land 400 is the biggest and most expensive acquisition program in the Australian Army’s history, with Phase 2 acquiring 225 combat reconnaissance vehicles in a project that will modernise the Army’s Armoured Fighting Vehicle capability and provide mounted support to defence operations for decades to come.
WorldSkills International Welding Competition

The world championship of skills and the greatest international vocational skills competition, the 44th WorldSkills Competition was held in Abu Dhabi over four days in mid-October. WorldSkills Australia selected a team of 43 Australian tradespeople and their mentors to represent their country at the international competition that comprised 3,000 participants including competitors, experts and officials, from 77 countries competing in 51 skills.

Dylan Bolch, 22, who was a student at TAFE NSW Hunter Tighes and is employed by Macquarie Manufacturing in Rathmines, competed in the Welding category.

During the competition, test plates were selected by surprise; welders had no prior knowledge of the welds they would be required to complete. On day one, the welds included:
- 5G pipe GTAW root, with a GMAW fill and cap
- 10mm 3G MMAW root, with a MMAW fill and cap
- 16mm 3G GMAW root, with a FCAW fill and cap
- 12mm 4F GMAW 10mm fillet
- 12mm 2F FCAW 10mm fillet

On days two and three, competitors welded a mild steel pressure vessel using four welding processes: MMAW, GMAW, FCAW and GTAW. On day four competitors welded 2mm stainless steel and 3mm aluminum using the GTAW process.

Bolch performed exceptionally well, finishing in sixth place with a score of 721 and receiving a Medallion of Excellence for his efforts.

According to Bolch, “Competing at WorldSkills was such a great honour. It was a dream come true to represent my country at the international competition. My favourite part of the competition was having the opportunity to see how I matched up against this elite level—I was able to compete against the best welders in the world.”

The preparation that Bolch undertook in the lead up to the competition was phenomenal. “In the 12 month lead up following the national finals, I began by training after work every week for four hours per day. Then, in the final six months before leaving for Abu Dhabi, I worked early and trained for six hours per day, plus every Saturday,” said Bolch.

“I also spent time in the United States competing in international competitions and during the final two months, I trained basically full time. I practiced all welding positions, using all processes on low carbon steels, as well as sheet metal stainless steel and aluminum.”

“If you are thinking about competing in WorldSkills, go ahead and do it. It will be the best experience you will ever be a part of. The skills I have obtained are priceless.”

L to R: Mark Williams (Compatriot Expert); Dylan Bolch (Welding Skillaroo); and Paul Condran (Welding Expert). Image courtesy of WorldSkills International.
“I would like to thank everyone who helped me along the way, as well as my local TAFE, my sponsors Lincoln Electric, and the WTIA for their ongoing support,” said Bolch.

Paul Condran, WorldSkills Welding Expert, supported Dylan throughout his journey and was incredibly proud of his results. “Dylan went really well at WorldSkills International. He improved so much over the course of the competition, with all the training that he did. He is clearly a very self-motivated young man—he put in so much effort. Dylan was going to work every day, sometimes working ten hour shifts, and then still training after work. He really is an exceptional young man.”

“For anyone considering entering WorldSkills, definitely have a go. There may only be one person who can represent Australia internationally, but it’s what you get out of the competition at every stage that is so important. It improves your welding skills exponentially—not only will you be picking up on new welding processes, your skill level across all those different processes will progress,” said Condran.

Sadly, for WorldSkills and welding apprentices across Australia, Condran is stepping down from his role as Welding Expert at the end of 2017.

Condran has been an integral part of the WorldSkills team for over 20 years, chaperoning countless welders at the international competition over the years. Condran even has competitors stay at his home with him and his family most years—often for weeks or months at a time—so that they can train as much as possible leading up to the competition.

According to Condran, “I’ve been International Chief Judge for the last eight competitions. This is my 20th year as a Welding Expert, after becoming involved in WorldSkills as a competitor myself. It’s someone else’s turn to step up now. I’ll still be involved with WorldSkills somehow though, I’m sure. The whole experience has been very positive. I get a real kick out of seeing young men and women exceed in what they’re doing.”

On behalf of the WTIA and all the welders that have competed in the WorldSkills competition over the years, we’d like to thank Paul Condran for all his hard work, dedication and support over the last 20 years.
Welcome to the WTIA’s 2017 Year In Review – a look at our achievements, projects and programs over the last 12 months. 2017 has been a highly successful year for the WTIA in many ways. It really is an exciting time to be a WTIA member. We are committed to using our extensive experience, combined with an innovative new approach, to achieve our core mission—promoting the interests of our members within the field of welding, not just in Australia, but across the globe.
6
MEMORANDUMS OF UNDERSTANDING SIGNED

18
MEMBER EVENTS

37
STATE DIVISION COMMITTEE MEETINGS

10
INDUSTRY EVENTS

75
HOTLINE QUERIES RESOLVED
2017: Industry Events

The WTIA was actively involved in various industry events throughout the year, with Geoff Crittenden (WTIA CEO) delivering keynote presentations and participating in expert panel discussions on numerous occasions. Just some of the industry events in which the WTIA was involved include the Australian Oil & Gas Exhibition, National Manufacturing Week, the National Manufacturing Summit, AIMEX, the TAFE Directors Conference, the Metals Industry Conference, and the Australian Steel Convention.

Australian Oil & Gas Exhibition, Perth, March
Geoff Crittenden presented an information session on the Australian Welder Certification Register (AWCR) at the Australian Oil & Gas Exhibition in Perth.

Geoff’s presentation covered topics such as the process involved in welder certification, the benefits that the AWCR has to offer individual welders and corporate members, and how to become an Approved Training Body.

The AWCR provides a national framework for qualifying and testing welders to International Standard ISO9606-1. The AWCR was met with strong industry support, particularly given the opportunities that certification offers West Australian welders.

National Manufacturing Week, Melbourne, May
At National Manufacturing Week in May, Geoff Crittenden chaired a very well received panel discussion on ‘Preserving Safety Through Compliant Fabricated Steel’ alongside Peter Milligan (AINDT) and Ian Cairns (Australian Steel Institute).

The discussion highlighted several alarming examples of unsafe fabricated steel, from multiple bridges in Western Australia, through to major landmarks, such as the Melbourne Star Observation Wheel.

According to the panelists, unless the Government legislates that Australian Standards are compulsory, and implements a rigorous system of compliance, public safety will remain at risk.

In conjunction with Greg Keen (Navantia), Julian Bende (Rheinmetall) and Miles Kenyon (DMTC), Geoff was also part of an extremely successful presentation. This presentation delivered practical advice on how Australian SMEs can access the global supply chains of these defence prime contractors, particularly in light of the Commonwealth’s emphasis on Australian Industry Content.

National Manufacturing Summit, Canberra, June
In late June, Paolo Corronca (WTIA Technology Manager) and Geoff Crittenden attended the National Manufacturing Summit 2017. Held at Parliament House in Canberra, the WTIA was proud to be one of the event’s sponsors.

Hosted by the Centre for Future Work and The Australia Institute, the Summit discussed the renewed positive potential for Australian manufacturing, including how the industry is perceived, barriers to its future expansion, and initiatives to accelerate the sector’s innovation and growth.

Speakers included government representatives such as Senator Arthur Sinodinos (Minister for Industry), Senator Kim Carr (Shadow Minister for Industry), Former Senator Nick Xenophon, and Senator Lee Rhiannon. There were also representatives from BlueScope, Thales, the Advanced Manufacturing Growth Centre, the Australian Council of Trade
Unions, and a number of universities. There was much interesting discussion about ‘Industry 4.0’ including implementation of the latest technology, and what the jobs of the future will look like.

**TAFE Directors Conference, Adelaide, September**

Geoff Crittenden spoke at the TAFE Directors Australia Convention in Adelaide. In his opening remarks, Crittenden highlighted how essential technical vocational training is to the future of Australia. According to Crittenden, “Technical vocational training is at least as important as primary, secondary and tertiary education—if not more so.”

“A fundamental flaw in both our education and government systems is that TAFE is not treated as essential infrastructure. TAFE simply does not receive the funds required to deliver high-quality technical vocational training to Australians. Our governments treat TAFE as a business—not as infrastructure—expecting increased revenue year-on-year.”

“And yet, government funded primary and secondary schools are not expected to generate revenue. So why has technical trade training become the poor relation of Australia’s education system? Why our governments fail to leverage these resources to help make Australian industry more competitive, both locally and globally, I fail to understand,” said Crittenden.

Alongside Brian Rungie (Executive Director Education, TAFE SA) Crittenden explained the Memorandum of Understanding (MoU) that the WTIA and TAFE SA have in place, using the MoU as an example of how TAFEs can work with industry.

**Metals Industry Conference, Christchurch, September**

The Heavy Engineering Research Association (HERA) along with Metals New Zealand presented the Metals Industry Conference 2017 in Christchurch in late September. Geoff Crittenden was invited to give the keynote presentation at the conference, speaking on the topic of ‘Australia’s Defence Industry Adventure’.

Crittenden began with a brief overview of Australia’s defence and shipbuilding industries. According to Crittenden, from 1939 to 1945, Australia transitioned from a largely agricultural to a full-blown manufacturing economy. In fact, Australia produced 60,000 small craft for the Pacific Fleet, and undertook more than 1,000,000 tons of ship repairs each month.

With BHP opening the largest shipyard in the Southern Hemisphere at Whyalla in 1941, it is not surprising that Australia was responsible for some of the most innovative defence projects. For instance, it was our manufacturing industry that invented the first malleable armour plate capable of being welded, and that produced the first cast tank hull in the world. This major defence work formed the basis of Australia’s manufacturing industry post-World War Two.

“Unfortunately, manufacturing was neglected by successive Australian governments, and it wasn’t until the 1990s that Australian industry once again embarked on defence projects, including the ten ANZAC Frigates (built from 1993 to 2006), the six Collins Class Submarines (built from 1990 to 2003), and the three Hobart Class Air Warfare Destroyers (commenced in 2009, and scheduled for completion by 2020).”

“Due to ongoing political interference, these projects have been plagued by issues, from late delivery through to systems, engine and propulsion noise problems,” said Crittenden.

“However, there is some good news. The Commonwealth has committed to spend $100 billion on major defence projects over the next 30 years, with a significant proportion of the spend to be directed to Australian SMEs through the Australian Industry Content program.”

“Australian welders need to capitalise on this opportunity. This is why the WTIA is implementing several projects designed to ensure that Australian welders have the skills necessary to deliver these major defence projects,” said Crittenden.
The WTIA is committed to ensuring that the Australian welding industry remains both locally and globally competitive. Engaging the welding community at a local level and nurturing the next generation of skilled welders in Australia play a key role in upholding that commitment. With the help of state committees, the WTIA regularly holds member events, from site visits and technical presentations, through to competitions, demonstrations and networking opportunities. WTIA state committees perform a number of roles, acting as the voice of the WTIA in their local community, and providing the WTIA with information on what we can do to help in their local area. If you would like to join your state’s committee in 2018 please contact the WTIA on membership@wtia.com.au.

Hedweld Facility Tour, Hunter Valley, February

Hedweld hosted a site tour of their newly opened advanced manufacturing facility in Mount Thorley. Hedweld’s $8 million facility in the Hunter Valley houses the latest cutting edge CNC machinery and robotics. Some of the new technologies at Hedweld’s facility are not only the first in Australia, but the first in the world. During the site tour, Hedweld demonstrated the capabilities of their 150 tonne Material Storage Station, designed and engineered to store plate used in the workshop, as well as the Kinetic K5600 and Mazak 3D Beamline Cutters. Hedweld has been manufacturing innovative mining equipment for over 35 years.

Technical Event, Townsville, March

In conjunction with North Queensland Testing Inspection & Calibration Services, the WTIA held a technical evening in Townsville in March. A number of important topics were covered, most notably the launch of the Australian Welder Certification Register (AWCR) and recent changes to industry standards, including AS5131 and AS1554. Feedback on the AWCR was very positive, with many members indicating that they’d experienced issues around the quality of welders work in the past. These issues were particularly concerning given the imminent commencement of work on the Adani coal mine in the Galilee Basin.

Technical Presentation, Perth, June

Phill Stubbington (National Welding Engineer, Lincoln Electric) gave a presentation entitled ‘Factors Affecting Mechanical Properties of Carbon and HSLA Steel Welded Joints’. The presentation covered microstructure and alloy design, demonstrating how practical considerations (such as arc length in the flat versus overhead position) influence mechanical properties. Phill then covered cold cracking and the factors that lead to this type of failure, particularly the influence of carbon on preheat and interpass requirements, as well as how welding process selection affects the weld metal toughness w.r.t deposit oxygen content.
RMIT’s Advanced Manufacturing Precinct Site Tour, Melbourne, September

Recognising the vital role manufacturing plays in Australia’s economy, RMIT’s Advanced Manufacturing Precinct was established in 2011 to meet the challenges facing the industry and to enhance the delivery of skills. The Precinct houses the most comprehensive range of additive and subtractive technologies locally, which provide access to cutting edge solutions to assist industry to develop new conceptual products or re-engineer existing products. Professor Milan Brandt, the Precinct’s Technical Director, hosted the tour and gave an informative presentation.

Baker & Provan Site Tour, Sydney, July

In July, WTIA members were treated to a tour of Baker & Provan’s facilities in St Marys, western Sydney. Members learnt about Baker & Provan’s capabilities and had the opportunity to see their 15 small, medium and large CNC milling and turning machines in action. A highlight of the tour was the heavy engineering machines: a 12m lathe with a maximum swing of 1.4m in diameter over the saddle; 12m x 4m CNC floor Borer with a bed rate at 100 tonne; the Nomura, a 4 axis 30 tonne CNC rotary table with 4m mast; the SNK, a 4 axis CNC machine with tables of 6.25m x 3.5m wide; and 4 axis CNC Machine Centre with 2 tables rated at 20 tonne.

RMIT Advanced Manufacturing Precinct Site Tour, Melbourne, September

ESAB Presentation and Tour, Adelaide, September

Michael Harvey (Applications Technology Manager, ESAB) spoke about the future of advanced technologies in Submerged Arc Welding (SAW) and Integrated Cold Electrodes (ICE). Instead of adding energy, ICE exploits the excess heat from the SAW process to melt an additional non-powered welding electrode. This very stable welding process doubles the productivity of most SAW applications without a considerable investment in new welding systems, extra capacity, or additional skilled welding labour. Tandem welding in root passes increases productivity and improves penetration, eliminating back gouging.

AS/NZS1554: The Great Debate, Brisbane, October

During this open discussion on the obligations of AS/NZS1554 - Structural steel welding, the pros and cons of welder qualifications according to AS/NZS1554.1 and ISO9606 were discussed, as well as how the two standards interact. Doug Hawkes (Principal Structural Engineer, Structural Integrity Engineering) opened the event with an overview of the Standards. Mark Sullivan (Welding Inspector and Supervisor, Certified Welding Company) spoke on the storage and handling of welding consumables and Andrew Gray (Managing Director, HiVue Inspection & Compliance) spoke on the ‘Why, What, When & How with WPS – an opportunity for debate’.
2017: Industry Partnerships

The WTIA brings individual and company members together into a community to deliver: a forum for the exchange of ideas and the sharing of resources; a voice to promote the interests of the welding community and shape the market for welding services; specialist technical problem solving; and a conduit between industry and research organisations; and a pathway for learning and career development and the opportunity to benchmark against world’s best practice. To deliver on these objectives, the WTIA works collaboratively with various private sector companies, TAFEs and national training bodies.

Defence Materials Technology Centre

In May 2017, the WTIA and the Defence Materials Technology Centre (DMTC) signed a collaboration agreement designed to support Australian welders and small-to-medium enterprises.

Under the agreement, the two organisations will work together to develop a broader understanding of existing technology footprints and build a program of benchmarking, capacity building, training and certification activities. In particular, the WTIA and DMTC will help build industry capacity in areas of Defence priority, such as the welding of high-strength steels.

According to WTIA Chief Executive Officer, Geoff Crittenden, “Together with DMTC, the WTIA will help Australian welders, suppliers and contractors embrace new technology, upskill the welding workforce, and gain a deeper understanding of the requirements of defence industry primes.”

“We are committed to ensuring all new defence equipment is built by Australian welders and that defence contractors have no reason or excuse for importing skilled labour to deliver these projects,” said Crittenden.

Under the agreement, both organisations will also work closely with the Centre for Defence Industry Capability (CDIC), the establishment of which was one of the key announcements in the 2016 Defence Industry Policy Statement.

Italian Institute of Welding

In October, the WTIA entered into a memorandum of agreement with the Instituto Italiano della Saldatura (Italian Institute of Welding).

The objective of the agreement is to explore possible cooperative ventures to facilitate personnel and company training, qualification...
and certification, such as the Australian shipbuilding projects, railways and structure structures.

It is expected that areas of cooperation will include training, qualification and certification of individual welders, certification of companies, development of welding and testing procedures, integration of Standards, joint research and development projects, technology transfer and industry development and integration.

**Navantia and TAFE SA**

Together with TAFE SA, the WTIA signed a Memorandum of Understanding (MoU) with Navantia in November. The objective of the MoU is to ensure that TAFE SA, the WTIA and Navantia work collaboratively so that Navantia Australia has access to the necessary welding capability to deliver the Future Frigates if selected.

Areas of cooperation include: training, qualification and certification of welders, supervisors, inspectors and technicians; development and qualification of welding and testing procedures; joint research and development; and technology transfer.

“WTIA and TAFE SA will work collaboratively with Navantia to provide the welding expertise, certified to international standards, required to deliver the Future Frigate Program,” said Crittenden.

“The success of projects like Australia’s Future Frigates relies heavily on the availability of a skilled workforce. We are becoming increasingly aware of the potential shortfall in qualified welders that will be required to deliver the Commonwealth’s ambitious $90 billion defence equipment programs.”

“Alongside TAFE SA and Navantia, the WTIA is committed to strengthening workforce training and development programs so that Australian welders can capitalise on the unprecedented lifelong career opportunities that major projects, such as the Future Frigates, have to offer,” said Crittenden.

**Ongoing Memorandums of Understanding**

Whilst not signed in 2017, the WTIA has several other ongoing MoUs in place. These include an MoU with:

- The American Welding Society (AWS) to provide online training courses and collaborate on a range of online education programs. It is through this agreement with the AWS that the WTIA was able to greatly expand upon its range of online courses.
- The Institut de Soudure (French Welding Institute) to facilitate technology transfer and ensure the smooth delivery of the Future Submarines project.
- DCNS Australia to improve the Australian welding industry’s capabilities and facilitate technology transfer from the defence shipbuilding program to the broader industrial sector.
- Various TAFEs across the nation (including TAFE SA, Regency TAFE and TAFE NSW) to help reinvigorate the trade of welding and to better support the Australian Welder Certification Register.
Securing the Future of Welding Through Training

In 2017, the WTIA implemented a number of projects designed to enhance the skills and capabilities of Australian welders, particularly in light of the multitude of upcoming defence equipment projects. Following widespread industry support for the qualification and certification of welders to ISO 9606-1 via the Australian Welder Certification Register (AWCR), Geoff Crittenden (WTIA CEO) met with all state governments on multiple occasions to establish Advanced Welder Training Centres. As a result, the WTIA has submitted formal proposals, policy papers or business cases to all state governments.

Phase one of the Advancer Welder Training Centres will utilise the latest welder training technology from Europe and the United States, including Seabery’s Soldamatic augmented reality simulators supplied by BOC. Not only do these simulators provide efficient, cost effective training for trade qualified welders, they also have the potential to quickly upskill non-trade transitional workers.

Once students have graduated from these augmented reality simulators, they will move onto the latest REALWELD training technology from Lincoln Electric. REALWELD is designed for in-situ use in a real world welding booth, in either arc-on or arc-off modes. REALWELD replicates common field conditions closely, better preparing students for work in the real world. As a user welds, the system analyses and scores every attempted weld trial and provides real time feedback, helping to prevent the formation of bad habits.

In phase two, the WTIA intends to develop a robot training capsule, which will teach welders how to program robotic machines to deliver high quality welds according to the appropriate welding procedure. To establish this capsule, the WTIA is working with the University of Wollongong and member company Robot Technologies-Systems Australia (RTA).

The third and final phase of the project will see the establishment of a laser laboratory that will allow students to learn about laser tracking devices, laser weld inspection and 3D laser scanning technology.

The purpose of the Advanced Welder Training Centres is to quickly qualify welders to the standard required by ISO 9606-1 Qualification testing of welders - Fusion welding. This will ensure a strong supply of capable welders, ready to deliver defence industry projects. The WTIA intends to establish 20 Centres around Australia to support defence prime contractors and SMEs looking to join the global supply chains of these prime contractors.

Victorian Skills Commissioner Steering Committee
The WTIA has been very fortunate to have received the support of the Victorian Government for the Advanced Welder Training Centres.

Geoff Crittenden (WTIA CEO) is currently chairing a steering committee for the Victorian Skills Commissioner. This steering committee has been charged with developing the curriculum that will be taught at the Advanced Welder Training Centres.

Steering committee members include representatives from TAFE Victoria, Victorian Skills Commissioner, Rob Vernon, Louis Victor Blain (Lead Welding Engineer, Bombardier), Phill Stubbington (National Welding Engineer, Lincoln Electric), Robert Wiseman and Malcolm Rigby.

Once accredited to the Victorian scheme, the curriculum can then become nationally accredited, and taught by any licensed Registered Training Organisation (RTO) in the country. Although the initial curriculum is focused on GMAW mid-steel welding, the steering committee is already considering the use of other welding processes and materials, including stainless steel, aluminum and titanium.

The West Australian State Government has also shown its support for the Centres, requesting a detailed business case on the project. In conjunction with South Metro TAFE, Geoff Crittenden is working on this business case, which is strongly supported by all major shipbuilders in Western Australia, particularly Austal.

Unfortunately, the South Australian Government has not been as supportive of the Centres. While the Hon. Susan Close (South Australian Minister for Higher Education and Skills) was enthusiastic, she was concerned about the capital investment required from the South Australian State Government.

Minister Close has requested a submission from TAFE SA encompassing the potential for augmented reality training in all industrial sectors. This will cause delays in developing the welder capability required for delivery of the Offshore Patrol Vessels and the Future Frigates. The decision by
the South Australian Government is contrary to industry needs and requirements, and has been made despite widespread support from all the defence industry primes.

According to Crittenden, “It is an absolute imperative that all state governments get behind technical training for the shipbuilding industry, and do so quickly—these types of projects always take much longer to establish than politicians imagine.”

What is Soldamatic?

Augmented reality training is student-focused, allowing individual students to progress at their own pace. This type of training is proven to be efficient, sustainable, safe and secure and allows training centres and industry to save costs and time whilst training professional welders. The WTIA and BOC (The Linde Group) have formed a partnership with Seabery to introduce their augmented reality training system—Soldamatic—to Australia.

Seabery’s Soldamatic Augmented Training is the first augmented reality welding educational technology solution in the world. According to Antonio Fernández, Seabery’s International Business Development Manager, “We started applying augmented reality to welding because welding is used across so many industrial sectors, from oil and gas and infrastructure, through to the automotive and energy industries. And yet, there is an enormous shortage of skilled welders worldwide, in both emerging economies, as well as developed nations such as America, where more than 300,000 new welders will be required by 2020.”

“Soldamatic enables training institutions, governments and welding associations to attract young people to industrial careers to close this ever-increasing gap between the market demand for qualified welders, and the available workforce,” said Fernández.

Soldamatic conducted tests comparing their augmented reality technology to traditional welding training. These tests were conducted in collaboration with GSI-SLV (a major German welding training centre), the Spanish Welding Association (CESOL), and large industrial companies (including Volkswagen).

The results demonstrated that 34% more welders were certified in 56% less time, saving up to 68% on the overall cost of welder training. In addition, Soldamatic increases the time on arc by three to five times, and enables training institutes to educate four times more students while maintaining their existing lab infrastructure.

There are a range of other benefits offered by augmented reality training technologies, such as Soldamatic. The augmented reality world can contextualise job-specific training, giving students the opportunity to experience the consequences of their decisions in a safe environment—mistakes simply invite exploration, rather than resulting in health and safety risks.

The acquisition and retention of knowledge and skills is similarly improved, with hands-on practice provided in conjunction with theoretical study. For a student, processing information that may already be perceived as tedious is unlikely to result in positive learning outcomes. Augmented reality training transforms training from boring theory and text books into high quality, interactive experiences that capture the imagination.

Soldamatic Augmented Training becomes more efficient when used in a classroom, connected to a central server that enables instructors to monitor students’ progress in real time. These types of classrooms are known as an ‘Augmented Lab’, a training centre that combines augmented reality welding simulation with real-world welding experience for the acquisition and improvement of manual skills.
What is REALWELD?

Workforce development training needs to educate tomorrow’s employees and help today’s workers improve upon their existing skill set. The result – a better trained, more knowledgeable worker at all phases of the employment cycle.

This is particularly true when it comes to educating workers in skilled trades such as welding, regardless of whether they are on a construction site or working in an advanced manufacturing facility. Incorporating new training technologies designed to narrow the skills gap, such as Lincoln Electric’s REALWELD Advanced Trainer, can help prepare graduates for real-world work in specific production processes.

REALWELD teaches multiple welding processes (MIG, stick and flux-cored) in a number of welding positions (1F, 2F, 3F, 4F, 1G, 2G and 3G) and joints (lap, tee, groove, flat plate) on 25.4mm plate, and 152mm or 457mm coupons.

Practicing on these longer welds replicates common field conditions more closely, better preparing students for work in the real world. Instructors can configure REALWELD’s ‘sweet spot’ parameters associated with proper welding technique using a built-in, instruction-set feature known as Welding Procedure Specifications (WPS) for each weld to be performed. They also have the ability to adjust tolerances to lenient, moderate, or stringent settings.

As a user welds, the system analyses and scores every attempted weld trial and provides embedded, on-screen information that students can access in the booth. This includes the ability to review such things as how-to videos, WPS documents and even instructor handouts (on topics such as safety data sheets), without ever leaving the welding booth.

REALWELD is more than an augmented reality trainer. It is a hands-on learning tool that enables companies and TAFEs to train welders faster and more efficiently, attracting and engaging the next generation of welders.”

According to Paul Howe, Lincoln Electric’s Sales Manager for Hard and Flexible Automation in Australia, “The most effective learning experience by far is the one that engages multiple senses.”

“REALWELD engages all the senses, particularly with its in-built audio coach that provides guidance on weld speed, angles, aim, contact tip to work distance, arc length and position in the weld. It’s like having a teacher’s assistant right in the booth helping to advance every student toward their career goals. These audio cues can be turned off at any time, allowing the student or prospective employee to quickly demonstrate learned behaviours.”

The result of these embedded features? Trainees receive immediate, objective, data-driven feedback. Instructors can track progress or immediately see bad habits being repeated. All of this can be done without the need for an instructor to hover over any particular student’s shoulder.

When used with advanced welding equipment like Lincoln Electric’s Power Wave C300, REALWELD exposes students to advanced manufacturing technologies used in industry today.
WTIA Training & Certification Developments

Several major WTIA training and certification projects continued throughout 2017.

In conjunction with the University of Wollongong (UOW), the WTIA completed the first of the redeveloped International Welding Engineer and International Welding Technologist courses, held at UOW. The WTIA has received very positive feedback on the revamped course content from all students.

The WTIA launched a number of new courses this year, including the Welding Inspector Grade One and Two courses, and Welding Appreciation for Technical Personnel.

In partnership with the American Welding Society (AWS), several new online courses were also introduced. These courses are available any time of day and night and are designed as self-paced modules, allowing students to complete them in their own time. The courses cover topics such as Safety in Welding, Fabrication Maths, Metallurgy, Non-Destructive Testing, the Economics of Welding, Welding Fundamentals, Welding Symbols and Welding Sales Representative.

We also facilitated an industry workshop on how to write winning tenders and proposals. Taught by Caroline Boot, Managing Director of international tender specialist companies Plan A and Clever Buying, the workshop covered topics such as bid strategy development, the evaluation process, tender templates and writing compelling executive summaries.

Welder training in line with ISO9606-1 Qualification testing of welders - Fusion welding was also a major focus this year. The WTIA conducted a two day 'Train the Trainer' course in Adelaide, which was attended by eight TAFE SA instructors.

The course focused on how to train and assess welders to meet the skill and capability requirements of the upcoming shipbuilding projects. As such, the course included an overview of how to weld in accordance with ISO qualified welding procedures that have been developed specifically for shipbuilding.

The WTIA also commenced the training of welding personnel in Australian in line with ISO 9606-1, providing tailored courses for companies such as WesTrac and WestConnex.

Further Information

If you require further information about training, please contact the WTIA on training@wtia.com.au or (02) 8748 0100, or visit www.wtia.com.au
Run on the WeldQ platform (a fully cloud-based system with a supporting mobile application), the AWCR was officially launched in March 2017.

Since March, more than 570 Australian welders and welding related personnel have registered on the AWCR. Welders have qualified via the AWCR for welding within industries as diverse as tunnel boring, transport and pressure equipment.

While some early teething problems were encountered, these were quickly resolved. In fact, according to feedback received to date, by affording independently verified welder qualifications, the AWCR can reduce both costs and risks for employers in Australian industry.

Employers can confirm the competence level of any Registered Welder against an internationally recognised standard, minimising the need for welder testing. This is particularly beneficial for employees who are required to move from site-to-site; they do not need to be re-qualified, resulting in a huge cost savings for employers.

Throughout 2017, the WTIA has given a number of presentations to industry groups, conference attendees, and WTIA state division meetings on the operation of both WeldQ and the AWCR. All feedback received has been very positive, particularly in relation to cost savings, improved record keeping and access to an unparalleled skills database, all without compromising weld quality or evidence of welder capability.

The WTIA is currently preparing to transition all their qualifications and training courses to WeldQ. For personnel who hold existing qualifications, discussions are underway to import these records directly into WeldQ in the most efficient and timely manner possible. This will allow existing qualifications to be verified by employers looking for evidence of qualifications held by prospective and existing employees.

Qualification
A number of qualification programs have been developed and published within WeldQ to suit specific industries, as well as specific roles. One such program is that for the certification of welders and welding supervisors to AS 1796. The WTIA will develop additional, tailored programs as the need arises.

The WTIA is currently preparing to transition all their qualifications and training courses to WeldQ. For personnel who hold existing qualifications, discussions are underway to import these records directly into WeldQ in the most efficient and timely manner possible. This will allow existing qualifications to be verified by employers looking for evidence of qualifications held by prospective and existing employees.

Certification
There are numerous certification programs available now within WeldQ, including those for welding inspectors, supervisors, technologists, engineers and welding practitioners. The key benefit offered by WeldQ is the ‘Work Diary’ functionality of the Professional Development tab. This allows users to log their work history, simplifying the certification application and assessment processes.

Reporting and Privacy
The WTIA is currently developing a range of reports within WeldQ that will enable companies to search for qualifications and certifications held by employees and any other person linked to their company. These independent records will simplify record keeping for quality management, particularly as auditors will be able to verify welder qualifications, for example, in real-time.

It should be noted that privacy issues were considered during the development of WeldQ and its search functionality. The private details of welders do not appear in a search. If a company wishes to contact a registered user, they must first seek the user’s permission through the WTIA.

Why the AWCR?
Benefits to Employers
• Reduced Costs: Check the competence level of any Registered Welder against an internationally recognised standard, minimising testing.
• Minimised Risk: By having a recognised and independently certificated qualification level, the risk of a welder failing a weld procedure is significantly reduced.
• Currency of Qualification: Assess welders against current, rather
than past, performance.

• Improved Record Keeping: Independent records of welder qualification simplify record keeping for quality management.
• Unparalleled Access to Skills Base: Quickly and easily identify and contact Registered Welders for employment.

Responsibilities of Employers
For the AWCR to be successful and deliver promised benefits to the Australian welding industry, it is essential that it has the support of employers who employ welders directly or indirectly. Please learn about the scheme, use the system and understand how it works. The WTIA asks all employers to:

• Encourage and incentivise all welders to join the scheme.
• Prefer the employment of Registered Welders wherever practical.
• Regularly promote the scheme internally and to service providers.
• Nominate a ‘Champion’ to ensure the register is up to date.
• Register suitably qualified staff for Approved Examiners status.

Benefits to Welders

• Improved Employability: Welders will be able to present third-party verified qualifications to prospective employers.
• International Qualification Recognition: Work overseas, with certificated ISO 9606-1 welder qualifications recognised in Australia, New Zealand, Europe and North America.
• Continuous Upskilling: In line with the AWCR’s testing framework, short training courses will be offered to upskill Registered Welders.
• Recognised Career Path: Test yourself on more complex weld procedures for more satisfying and rewarding career opportunities.

Responsibilities of Welders
Registered Welders are responsible for maintaining their qualification record. Failure to do so can lead to suspension or withdrawal of the qualification certificate. Registered Welders must ensure that:

• Their contact details, qualifications and work history (optional) are up to date.
• Details of every weld test passed are accurately entered onto the register by the Approved Examiner who conducted the test.
• A responsible person (Supervisor or Approved Examiner) provides evidence of their qualification confirmation every six months.
• The revalidation process is completed every two years.

Further Information
In establishing the Australian Welder Certification Register (AWCR), the objectives of the WTIA are to: create welding jobs by increasing the efficiency and profitability of Australian industry; and provide a framework for upskilling Australian welders and improving their employability. If you would like to become a registered welder on the AWCR, or would like access to the unparalleled skills database offered by the AWCR to employers, please visit: www.awcr.org.au.
Australian Standards are living documents. They reflect progresses in science, technology and systems. To maintain their relevancy, all Standards are periodically reviewed, with amendments and revised editions published. 2017 has been a busy year within the world of Standards. Developments have occurred across a range of industry sectors, as well as in the international sphere.

Aged Standards
A number of important welding standards (drafted by now inactive committees) were declared ‘Aged’ in 2015. These standards were allocated to Committee WD-003 and are being reconfirmed until such time as resources permit their revision.

Standards affected include AS1103.1 Graphical symbols for engineering Welding and non-destructive examination, AS2812 Welding, brazing and cutting of metals - Glossary of terms, the AS2205 series (Methods of destructive testing of welds in metal) and AS3545 Welding positions.

With most of these standards to be reconfirmed, it is anticipated that ISO6947 Welding and allied processes - Welding positions will be adopted, and AS3545 will be withdrawn once the current revision of the ISO standard is complete.

Bridges
After a number of years in development, AS5100 Bridge design was published during 2017. Modelled on AS4100 Steel structures and the latest international bridge design research, an important outcome for Australia and New Zealand was that Part 6 has made normative reference to AS/NZS ISO 3834 Quality requirements for fusion welding of metallic materials for the first time.

Whilst the standard does not require fabricators to obtain certification to AS/NZS ISO 3834 and its parts (irrespective of what quality systems the fabricator has in place), it is essential to have all elements of the welding and fabrication process under appropriate control. Whilst certification may be advantageous to
fabricators within the bridge sector, AS/NZS 5100.6 is intentionally silent on certification as it is regarded as a commercial matter for resolution between the fabricator and the principal of the works.

**Design and Fabrication**

With the publication of AS/NZS5131 *Structural steelwork – Fabrication* in 2016, Standards Australia has approved the revision of AS4100 to refer to AS/NZS5131 for the fabrication of steelwork.

As AS4100 is a primary reference within the Building Code of Australia (BCA), it is necessary to amend AS/NZS5131 so that it can be utilised as a secondary reference from within AS4100. Work has commenced on the revision of both of these standards to meet BCA requirements and both revisions should be available for public comment in early 2018.

**Pressure Equipment**

During 2017, the WTIA formed a working group of industry experts from Australia and New Zealand to commence the revision of AS3788 *Pressure equipment-In-service inspection*. The working group first met in April and the revision is well under way.

It is anticipated that the working group will prepare three documents for publication including: a new Technical Note on the repair of Pressure Equipment; a working draft of the revised AS3788 for submission to Standards Australia; and a Commentary on AS3788.

Also in the pressure equipment industry, it has been reported that AS/NZS3992:2015 *Pressure equipment - Welding and brazing qualification* requires a minor revision to clarify items within the Standard and correct known errors. A project has been approved by Standards Australia to prepare the revised text, under the direction of Committee ME-001.

**Structural Applications**

In 2016, it was found necessary to update AS/NZS1554.3 *Structural steel welding Part 3: Welding of reinforcing steel* to provide a revised text amendment to facilitate fabrication of steel reinforcement cages in particular.

This work has just been completed and the Amendment published in November 2017. At the same time, Committee WD-003 prepared correction amendments to AS/NZS1554 Parts 1, 4 and 5. The primary requirement was to correct a number of anomalies relating to high fatigue applications published in the 2014 edition of the standards. These amendments were published in 2017.

Following a review of AS2214 *Certification of welding supervisors – Structural steel welding*, a project to revise and co-join AS2214 with New Zealand has been approved by Standards Australia to update the text under the direction of WD-003.

**Welding Personnel**

With the Federal Government moving forward on the Air Warfare Destroyer project and Collins Class submarine replacement project, the need to adopt specific ISO standards relevant to these projects has been recognised. Accordingly, Australia has moved to formally adopt ISO9606-1 *Qualification testing of welders - Fusion welding: Part 1 Steels*. This standard covering the qualification of welders, has been recognised in numerous Australian and New Zealand standards for some years.

Work on the adoption is now almost complete with the balloting process having recently concluded following a period of public review. Included in this development is a revision of AS/NZS2980 *Qualification of welders for fusion welding of steels* which draws heavily upon ISO9606-1. Review of submitted public comment is currently being considered by the Committee. Longer term, it is anticipated that AS/NZS2980 will eventually be withdrawn and superseded by AS/NZS ISO9606-1.

**ISO**

During 2017, Australia attended a number of ISO meetings to present our views on the development of a number of international standards of particular interest to Australia.

Meetings attended included ISO/TC44/SC11 and ISO/TC167 where several standards were reviewed, including ISO9606-1, ISO14731 *Welding coordination – Tasks and responsibilities* and ISO/DIS17607 *Steel structures – Execution of structural steelwork*.

It has been agreed within ISO/TC44/SC11 that ISO9606-1 will be revised in early 2018, with final comment on the revision of ISO14731 to be resolved in January 2018. Work within ISO/TC167 on ISO/DIS17607 (similar to our AS/NZS5131) has been terminated and is likely to resume in 2018 with the original draft being split into core parts to address the concerns of stakeholders.

**2018**

The year ahead is likely to be busy in the world of welding standards across a range of committees. The revisions, adoptions and proposals outlined above are well underway with publication planned in most cases during 2018. Australia will also continue to support the revision to ISO standards relevant to Australia. Members will be kept informed though updates in *Australian Welding* magazine and the WTIA’s monthly newsletter, *Weld Connect*. 
SMART Industry Group Activities in 2017

The WTIA’s SMART (Save Money And Re-engineer with Technology) Industry Groups provide a forum for technology transfer and research and development, linking members with industry and research organisations. The WTIA works with SMART Group members to ensure they remain diverse and resilient in the ever-changing and increasingly challenging domestic and global markets. SMART Group members engineer innovative solutions that enhance safety, manage risk, reduce cost, and optimise operating efficiency, by: sharing the cost of implementing new technologies; developing best practices; and providing a forum to brainstorm common needs and effective solutions.

SMART Defence Industry Group

The SMART Defence Industry Group met twice in 2017; in Adelaide in April (hosted by ASC) and in Perth in October (hosted by Austal).

Attendees at these meetings included representatives from ASC, Austal, BAE Systems, Baker and Provan, Bisalloy, CDIC, DMTC, Defence West, Fincantieri, Rheinmetall, South Metro TAFE, TAFE SA, the University of Wollongong, Watkins Steel, the South Australian Department of State Development and the West Australian Department of Training and Workforce Development.

As a result of SMART Defence Industry Group discussions, the WTIA worked on several projects in 2017 designed to enhance the capability of Australian welders in delivering defence equipment. The first of these projects is the establishment of advanced welder training centres across Australia.

The second project is a steering committee for the Victorian Skills Commissioner. Chaired by Geoff Crittenden (WTIA CEO), this steering committee has been charged with developing the curriculum that will be taught at the Advanced Welder Training Centres.

Once accredited to the Victorian scheme, the curriculum can then become nationally accredited, and taught by any licensed Registered Training Organisation (RTO) in the country.

Finally, the WTIA signed two important defence industry Memorandums of Understanding this year—one with Navantia and TAFE SA, and the other with the Italian Institute of Welding. The aim of both MoUs is to upskill Australian welders and facilitate technology transfer for specific projects.

Members were treated to several informative and engaging presentations at meetings throughout the year. Emmanuel Miti (Defence West) provided an overview of the defence hubs in Western Australia, highlighting how the organisation is championing to create a globally competitive defence industry.

Paolo Campi and Greg Tunny (Fincantieri) gave an overview of Fincantieri’s operations and presented a case study outlining the company’s expansion in Western Australia, highlighting how the organisation is championing to create a globally competitive defence industry.

Rod Brown (ASC) spoke about ASC’s support of Australian submarine workforce capabilities. According to Brown, ASC’s workforce is currently around 950 in South Australia and 350 in West Australia. ASC is in the process of establishing collaborations for skilled workforce training and development of submarine skillsets.

SMART Australian Power Technology (APT) Industry Group

The SMART APT Industry Group met twice in 2017; in Brisbane in April (hosted by CS Energy) and in Sydney in November (hosted by ANSTO). Attendees included representatives from AGL Energy, Engie, Energy Australia, NRG Gladstone Power Station, Stanwell Corporation, CS Energy, Synergy, ANSTO, HRL Technology, ALS Global, Quest Integrity and Thornton Engineering.

The first meeting included a site visit to the Australian Solar Thermal Research Initiative at the University of Queensland. The presentations provided an overview of solar thermal technology, and current salt storage research. A tour was provided of the Central Analytical Research Facility (CARF), showcasing excellent facilities for analysis, characterisation and testing of most substances. Of particular interest to the SMART Group were
the laboratories specialising in physical and mechanical properties, surface science, x-ray and electron microscopy and x-ray and particle diffraction.

One of the most important areas of focus for the SMART APT Industry Group this year was the revision and update of AS/NZS3788. One of the key elements of this update is the incorporation of Risk Based Inspection (RBI), traceability and sign-off for deferred inspections, which is giving rise to issues around how to incorporate corporate governance into the update.

This becomes even more difficult given that each state has different statutory regulations. For example, Queensland requires a Registered Professional Engineer Queensland (RPEQ) to undertake inspections, while other states require only an independent inspector.

Part of the corporate governance discussion highlighted the issue around weld quality management and the need for AS/NZS ISO3834 certification. The SMART Group agreed that all APT members will work with the WTIA towards certification, which will then be rolled out to contractors working on site.

The Australian Welder Certification Register (AWCR) was also discussed. Stanwell Power Station agreed that, as part of their planned shut down, they would require all welders working onsite to be certified and qualified on the AWCR. Stanwell set up a certification centre to help achieve this goal.

CS Energy and AGL also requested further details about the AWCR, which will enable them to enter into discussions with their prime contractors, with a view to having them registered on the AWCR.

Meeting attendees were also treated to presentations and demonstrations on specialised non-destructive testing (NDT), specifically non-invasive NDT. This will continue to be a focus area for this forum to provide members with the technical information required on each proposed inspection technique, its advantages and limitations so that they can make informed decisions.

Finally, several projects progressed this year, which are outlined below.

**Replication Project (PG7):** This project was completed. This project provides the basis for assessing replica evaluators and auditing their companies for training with respect to replica evaluation.

One company has already been audited, with another undergoing an audit.

**REMLIFE:** With the purchase of REMLIFE by ALS, participating members have the option to continue with the new cloud-based version, or liaise directly with ALS for evaluations. ALS provided feedback on the progress with Enterprise, the cloud-based version, and showed how materials and code or standard information were updated to provide better assessment outcomes.

**Welding Procedure Database:** Gaps in the database were identified and members voted on priorities. These were combined into a list of eight procedures that will be completed in 2017, after which the Database will have a total of 24 procedures covering most of the creep resistant materials in use. Some innovative materials used include EPRI’s P87 welding consumable with low chromium for dissimilar metal welds and the new Super304H.

**HRL Piping Database Project:** This project was completed. The program will be limited to site only (rather than a national database), but can still be used to improve safety systems, reduce costs for inspections on high-risk piping and demonstrate effective governance of high risk assets.
SMART Road & Rail Industry Group

The SMART Road & Rail Industry Group met twice in 2017; in April and October in Sydney (hosted by Roads and Maritime Services). These meetings were attended by representatives from Roads and Maritime Services (New South Wales), VicRoads (Victoria), Transport and Main Roads (Queensland), Department of Planning, Transport and Infrastructure (South Australia), and Main Roads (Western Australia).

During the meeting in October, SMART Group Chairman, Houman Hatamian (Welding Engineer, Roads and Maritime Services) provided an overview on the progress of the Austroads Steel Fabrication Specification (ASFS).

Currently, each Australian state has its own State Road Authority (SRA), with its own technical requirements for the design, manufacture and procurement of steel structures. These state-specific requirements create a barrier to consistent manufacture of products. The aim of the ASFS is therefore to create harmonised technical specifications, shared across all SRAs. This will allow a competitive national tendering process guided by consistent national standards.

SMART Group members reviewed the ASFS and acknowledged that more work needs to be done in order to align AS/NZS 5131:2016 with the ASFS. Accordingly, Andrew Walker (Manager Construction Materials, VicRoads) has agreed to work on a document that will include the technical contents of AS/NZS 5131 in the draft ASFS.

During his presentation, Houman Hatamian stressed the importance of the certification of welders to AS/NZS ISO 3834 to meet the requirements of Construction Category Three, included within the ASFS. The corporate governance discussion that followed highlighted the issues around weld quality management and the need for AS/NZS ISO 3834 certification. The SMART Group agreed that all members will work with the WTIA towards certification, which will then be rolled out to the fabricators working on-site.

The Austroads Working Group and the Austroads Bridge Task Force acknowledged the facilitation role played by the WTIA in establishing and supporting the development of the ASFS.

Geoff Crittenden (CEO, WTIA) also spoke, highlighting the certification advantages offered by the Australian Welder Certification Register (AWCR), under which welders will be qualified to ISO 9606-1.

The AWCR offers a range of benefits that are particularly beneficial to self-employed welders, welders employed by labour hire companies, fabricators providing breakdown and maintenance services across a range of industries, as well as fabricators working on government infrastructure projects.

Fabrication and construction companies, project managers, inspection agencies and government agencies will also be able to query the AWCR to verify the status and extent of a welder’s qualifications, simplifying project management requirements and validating qualifications and experience prior
to employment. The opportunity to qualify and register as approved examiners will also be provided to welding supervisors, inspectors, trainers and welding engineers via the AWCR.

The AWCR was well received by all SMART Group members, and some discussion took place on the best way to leverage the new system moving forward.

Paul Adams (Senior Engineer, Transport and Main Roads) and Houman Hatamian also provided an overview of the newly released Roads and Maritime Services Specification B201 (Steel Work for Bridges), and provided a comparative analysis between Specification B201 and the ASFS.

Paul also raised a very important issue in relation to welding supervision, suggesting that the WTIA develop an online training course for Welding Supervisors. He emphasised that if the qualification process for Welding Supervisors becomes too difficult, industry is unlikely to invest in the new process, which could lead to the closure of many businesses in Queensland. The position of Welding Coordinator is a key element of AS/NZS ISO 3834.2. For effective implementation of this Standard, Paul suggested that Welding Coordinators should be required to have formal qualification and certification.

In his current role, Paul manages a number of sites simultaneously, and has to depend on Welding Supervisors who (although they have sufficient knowledge and experience), often have no formal qualifications.

Paul proposed that the WTIA develop a formal pathway that will enable senior, experienced welders to become Welding Supervisors, and Welding Supervisors to become Responsible Welding Coordinators.

SMART Group members also expressed the need for the development of Austroads Stainless Steel and Aluminium Fabrication Specifications. These Specifications will set out the minimum requirements for the preparation, welding, inspection, testing, and final acceptance of stainless steel and aluminium structures and components.

Finally, Kumar Ponnampalam (Senior Bridge Engineer, Roads and Maritime Services) outlined the current practice and highlighted critical infrastructure activities for the execution of steel work. He emphasised the importance of ‘Technical Capability Assessment’ (which is effectively a competency assessment), as well as product conformity assessment based on:

- Materials: Australian Technical Infrastructure Committee Scheme 10 / ACRS
- Welding: AS/NZS ISO 3834.2 Certification
- Fabrication: Australian Technical Infrastructure Committee Scheme 22
- Bolting: Australian Technical Infrastructure Committee Scheme 21 and AS/NZS ISO17065
- Protective Coating: PCCP / By CSIRO APAS
- Erection: Australian Technical Infrastructure Committee Scheme 22
Industry Outlook: 2018 and Beyond

According to the Advanced Manufacturing Growth Centre, manufacturing is undergoing a historic transformation across the industrialised world. Firms are creatively diversifying their focus across different stages of the manufacturing process, both before and after goods are produced. As low cost production activities are gradually being outsourced to developing countries offering cheap labour, more Australian manufacturers are recognising the need to compete on value rather than cost. Most commonly, this involves contributing innovative products, components or services within global supply chains. It is against this backdrop that we take a look at what lies ahead in 2018 and beyond.

“Every single manufacturer in Australia has the potential to be advanced.”

~ Advanced Manufacturing Growth Centre
According to a report commissioned by the Advanced Manufacturing Growth Centre (AMGC), the Australian manufacturing industry is larger and more dynamic than currently estimated.

*Advanced Manufacturing: A New Definition for a New Era*, analyses more than 3,000 global manufacturers to provide substantiated clarity to an industry undergoing unprecedented change, while also outlining key opportunities for local manufacturers.

The AMGC report also reveals that only 5% of firms drive 99% of total manufacturing exports, 94% of capital spending and 54% of the sector’s entire research and development. Meanwhile, 80% of Australian manufacturers could become more advanced by collaborating with researchers, increasing their information and communication technology (ICT) spend, introducing a new product-related service or by using patents to protect their ideas.

“Our research shows that almost half of all manufacturing jobs are in non-production based roles. Being a successful advanced manufacturer is no longer just about what you make but how you make it and the way you run your business,” said Goennemann.

“Manufacturing is transforming, so we need a new definition to accurately measure who we are and where we need to go. Our research presents a real opportunity for Australian manufacturers. It shows that we have huge growth potential if we can emulate and adopt the advanced manufacturing characteristics unveiled in this report,” said Dr Jens Goennemann (Managing Director, AMGC).

“Australia’s manufacturing exports generate close to $9 billion every month so just imagine what the possibilities could be if we increased the number of firms contributing to economic output by even 5% or 10%,” said Goennemann.

Redefining Manufacturing
The AMGC has called for a new definition of advanced manufacturing to incorporate the entire manufacturing value chain including higher value pre-production and post-production.

In May 2017, the Australian Bureau of Statistics recorded 905,000 direct jobs in Australia’s manufacturing sector. Under the new definition this would rise to almost 1.3 million if indirect workers that supply inputs and services to manufacturing are included, for example, workers exclusively delivering research and development, design, logistics or services to manufacturers.

“Our research shows that almost half of all manufacturing jobs are in non-production based roles. Being a successful advanced manufacturer is no longer just about what you make but how you make it and the way you run your business,” said Goennemann.

“Manufacturing is more than production. Manufacturing comprises of research and development (R&D), design, supply chain and logistics, mass customised goods, post-sales support and services.”

The traditional assembly line is becoming disaggregated as global systems integrators outsource key functions and individual firms move to specialise along different parts of the manufacturing process.

In this fast changing landscape, the key opportunity for manufacturers is to offer differentiated value propositions both before and after goods are produced – and to feed distinctive products, components and services into global supply chains.

Digital innovations such as 3D printing, which allows goods to be produced anywhere at any time, overlay the new manufacturing value chain and are accelerating the reinvention of the assembly line.

Industry 4.0 technologies denote a broader paradigm shift in which intelligence and machine learning are embedded across the entire manufacturing cycle.

In the pre-production stages, manufacturers can add more value through R&D or complex planning and design work. In the
post-production phase, they can contribute value-adding services that support or complement products and help establish long-term relationships with customers. This shift to ‘manufacturing as a service’ involves focusing on customer needs, potentially by providing a capability or solution rather than just selling physical goods.

For example, General Electric (GE) uses a software platform to collect real-time data from aeroplane engines. This helps pilots maximise fuel efficiency based on insights from sensors that log vast quantities of data on every flight.

Several industrialised, higher-wage economies such as Germany, Japan and South Korea have made the leap to becoming advanced manufacturing nations that do not simply rely on mass production. Within these countries, 85% to 90% of total national R&D funding by all businesses in their economy is spent within the manufacturing sector. No longer as competitive at hiring low-skill labour, these countries have shifted to using a higher skilled workforce and more efficient technologies.

The challenge for Australia, where manufacturers only funded about 27% of total national R&D investment in 2013–2014, is to replicate this success in 2018 and beyond. This will be achieved by transitioning from a cost-based model of competitiveness to one that seeks to differentiate on value.

According to Goennemann, “The biggest opportunity for Australian manufacturers is to compete on value—do something better than everyone else, rather than trying to compete on cost. When you provide something that no one else can, you can then reach out beyond the domestic market and become globally competitive. This gives you a market opportunity far beyond our population of 24 million in Australia. Your potential market becomes the seven billion customers worldwide. Compete on value, not on cost. Be a technology leader or a servitisation leader – offer something unique to your customers.”

When it comes to opportunities for Australia’s welding industry, Goennemann believes that, “The massive onshore shipbuilding opportunities will be a huge source of business for welders, not only in build but in sustainment.”

“The idea of ‘it’s not what you make, but how you make it’ applies to welding too. Welding might be perceived as a traditional process, but it’s about how you turn this traditional process into an advanced process by incorporating technology. By using technology like robotics, the traditional yet skill-intensive trade becomes more innovative,” said Goennemann.

Recommendations for Government

It is vital that Australia moves boldly into a future typified by sustainable, high-value-added manufacturing. The nation must also accurately monitor the impact of manufacturing activities on other industries in an increasingly service-based economy. AMGC recommends three urgent actions.

Developing a New Statistical Tool to Track whether Australian Manufacturers are Advancing

Alongside traditional metrics such as output, jobs and exports, this tool would monitor short and medium term changes in the prevalence of key advanced characteristics among Australian firms, such as R&D intensity, patent use, collaboration, relative wage levels, ICT expenditure, capital intensity, new goods or services, new marketing or operational processes, and trade intensity.

Changing How Australia’s Manufacturing Output and Jobs Growth are Reported

Official data on Australian manufacturing should fully capture all activities linked to the sector, instead of disaggregating the value chain and counting ancillary functions as part of ‘services’. The

“Being an advanced manufacturer is not what a manufacturer makes but how.”

~ Advanced Manufacturing Growth Centre
United States Bureau of Labor Statistics, which constructs annual employment tables for 168 sub-industries, provides an example of how to measure manufacturing jobs and output that are created both directly and indirectly.

**Better Target Industry Assistance**
Governments should ensure that business capability-building initiatives are designed to increase the prevalence of traits associated with more advanced and successful companies. Evaluation criteria should be adjusted accordingly for programs offering financial incentives or support.

Initiatives that could be better targeted include the Entrepreneurs’ Programme; Industry Skills Fund; Education and Training Advisors; Innovation Connections; the R&D Tax Incentive; the Cooperative Research Centres Program; the Tradex Scheme; venture capital programs; and state-based industry assistance funds.

**Recommendations for Companies**
According to Goennemann, there are three key characteristics of advanced manufacturers, which can be used as a blueprint for local organisations in the industry to emulate.

**Advanced Knowledge**
Innovation leaders that score highly on measures such as:
- Higher spending on R&D
- Higher ICT intensity
- Larger patent portfolio
- More collaboration with research institutions and other companies
- Higher relative salaries
- Better qualified employees
- More staff with STEM skills

**Advanced Processes**
Process winners that make smarter use of technology, scoring highly on:
- Greater capital intensity
- Newer equipment
- More automation
- Smarter inventory management
- Better energy and water efficiency

**Advanced Business Models**
Act as niche market players, scoring highly on measures such as:
- Higher product value density (by weight)
- Higher marketing expenditure
- Higher trade intensity (exports)
- More extensive backward links
- Larger geographical reach
- Greater share of services in total revenue

"Currently, just 5% of firms drive 94% of the sector’s entire capital spending and 54% of its entire R&D spending.”

~ Advanced Manufacturing Growth Centre

**About the Advanced Manufacturing Growth Centre**
The Advanced Manufacturing Growth Centre is an industry-led organisation established through the Australian Government’s Industry Growth Centres initiative. The purpose of the Advanced Manufacturing Growth Centre is to transform Australian Manufacturing to be more globally competitive and generate the demand for jobs. For more information, visit: www.amgc.org.au.
Australian Manufacturing: 
A Moment of Opportunity

Australian manufacturing endured a devastating retrenchment in the years following the Global Financial Crisis. The industry’s output, employment, investment, and exports were damaged by the combined impacts of weak global demand conditions, a substantially overvalued Australian currency and an ambiguous and inconsistent domestic policy context. Since 2008, the sector’s output has declined by 13%, and employment by a similar proportion. Despite this painful contraction, the industry has subsequently stabilised and remains one of Australia’s most important industries. Accounting for close to one million jobs, $100 billion per year in value-added, and $100 billion per year in exports, the industry’s contribution to the national economy should not be taken for granted.

According to The Australia Institute, Australia’s manufacturing industry has survived a difficult period, in the face of daunting domestic and global challenges. Other seemingly more vibrant sectors such as resource extraction, financial services, or property development capture considerable attention from the media and policy makers.

In contrast, manufacturing attracts relatively little attention in current economic reporting or policy making – and much of the attention it does receive focuses on announcements of financial losses, factory closures, and redundancies. Australians would be forgiven for concluding that manufacturing has generally dim prospects on this continent.

However, according to Jim Stanford (Economist and Director, Centre for Future Work at the Australia Institute), “Those who have ‘written off’ manufacturing as a sector that could add to Australia’s future growth and prosperity, are missing promising signs that the industry could be poised for a recovery.”

“Several economic indicators suggest a more positive future for the industry in Australia. Contrary to past trends, manufacturing employment has actually increased in the past year, exports and profits have expanded, and business confidence is very positive.”

“Moreover, despite the challenges of the past decade, manufacturing retains a strategic importance in the national economy that is disproportionate to its share of direct employment or output. Its innovation record is second to none among Australian industries, it makes an outsized contribution to exports, and its long and complex supply chain generates extensive spill-over benefits for all regions and sectors of the national economy,” said Stanford.

In fact, the most recent data from The Australia Institute indicates that the sector allocates almost 5% of its sector value-added to new R&D expenditure, more than any other sector – more even than the scientific and professional services sector. Manufacturing is inherently more reliant on innovation activity, in both product and process, because of the natural applicability of automation in manufacturing processes. Moreover, applied innovation in other sectors almost universally requires the application of advanced machinery, equipment, and other manufactured products. For both reasons—the demand for innovation, and the supply of innovation promoting outputs—a strong, healthy manufacturing sector is a prerequisite for successful, economy-wide innovation.

“All of these trends suggest that manufacturing activity has stabilised after a very challenging decade, and now shows a greater potential for expansion than at any time in many years. To be sure, the industry still faces challenges - not least the cessation of mass motor vehicle assembly, volatile energy markets, and continuing large trade imbalances. But the overall improvement in business conditions suggests that, with appropriate actions by all stakeholders, the sector could have a much brighter future in Australia than has been commonly assumed.”

These business improvements can be seen across markers such as improved employment figures, profits and exports. Trend employment data published by the Australian Bureau of Statistics (ABS) indicates an increase of 40,000 in manufacturing
employment over the last year. Quarterly gross operating profits in manufacturing reached close to $8 billion in the March 2017 quarter, the highest in several years. From a low of $80 billion in 2009, the value of Australian-made manufactures sold to international markets has grown by 25%, reaching an all-time high of over $100 billion in the last 12 months.

New national polling by the Centre for Future Work and the Australia Institute, conducted in April and May 2017, confirms that Australians continue to see the success of manufacturing as critical to national economic prosperity. Perhaps influenced by the negative tone of much recent reportage and commentary, Australians consistently underestimate the importance of manufacturing in Australia’s economy, relative to other industries, and very few are aware of the improving economic conditions in the sector (such as the job-creation that has been registered over the past year).

However, despite this underestimation of manufacturing’s continuing footprint, Australians nevertheless express remarkably strong agreement that manufacturing is vital to Australia’s economic success. These polling results confirm Australians’ conviction that manufacturing is crucial for quality jobs, success in international trade, and national prosperity. Most importantly, an overwhelming majority of Australians express support for pro-active, targeted policy measures to sustain and support manufacturing.

“But they endorse by overwhelming margins – five to one in some cases – targeted policies to support manufacturing investment in Australian research, capital assets, and exports. Support for active manufacturing policy is strong across all age and voting groups. These results suggest an important political opening for political leaders from all parties to recommit to manufacturing, and grant the sector greater priority in economic policy making,” said Stanford.

“The combination of more amenable macroeconomic conditions and continuing public support, presents a potent and promising opportunity for all manufacturing stakeholders. There is more economic space than at any time in recent years to expand investment, production, and employment in value-added manufacturing. And the public will support active measures that are consistent with this goal.”

For more information, or to download a copy of The Australia Institute’s recent report, Manufacturing: A Moment of Opportunity, visit: www.futurework.org.au
Industry Outlook: WTIA Member Survey

In August 2017, the WTIA surveyed over 100 of its Corporate Members, and more than 120 of its Individual Members. With a focus on the future of the welding industry in Australia, survey questions explored everything from member investment plans and workforce management resources, through to existing concerns and hopes for the industry over the next five years. Here is what we learned.

When asked where they see their business five years from now, an overwhelming majority of 67% of Corporate Members said they see their business growing (as per Figure One below). Another 18% said that they believe their business will remain the same.

These figures are quite interesting, particularly given that 48% of both Corporate and Individual Members stated that they would sum up their current feeling about the future of welding in Australia as cautious (as per Figure Two below). Just 38% of members were positive about the future of the welding industry, while 14% were negative. Clearly, although there are some concerns about the future of the welding industry as a whole, Corporate Members are quite confident in their company's abilities to remain successful.

This confidence may derive from Corporate Members’ plans to target various industries in order to diversify their businesses. The most popular of these target industries was the mining machinery and equipment industry, with 49% of respondents indicating their interest in this industry. This was followed by the oil and gas industry (43%), power generation (41%), construction (35%) and defence (35%).

When it comes to specific concerns, Corporate Members confirmed that the following issues keep them awake at night (as per Figure Five opposite):
- Rising costs (51%)
- Lack of skilled workers (42%)
- Increased customer expectations (31%)
- Ensuring and maintaining compliance (31%)
- Increased competition (29%)
- Workplace health and safety (24%)

For Individual Members, the issues that keep them awake at night (as per Figure Five opposite) include:
- Lack of employment opportunities (27%)
- Rising costs (23%)
- Income security (22%)
- Workplace health and safety (11%)
- Increased competition (9%)

It is interesting to note that while Individual Members are concerned about a lack of employment opportunities, Corporate Members are concerned about a lack of skilled workers. A recent Australian employment outlook survey confirms Corporate Members’ concern over a lack of skilled workers, with 38% of Australian employers admitting that filling job vacancies is increasingly difficult, largely due to lack of experience (23%), a shortage of applicants (21%) and a lack of skills (2%).

The welding industry is further affected due to the fact that 32.9% of Australia’s existing welding workforce is aged over 45 years. The projected increased demand for welders in growth industries means that a large proportion of current welders will leave a gaping hole in the workforce on retirement—an issue likely to be faced in all industrial sectors.

The Australian Government has projected that the number of job openings for structural steel and welding trades will...
be above average until November 2019. An employment growth rate of 7.2% is expected over the next five years for structural steel and welding trade workers.

Not surprisingly then, Corporate Members indicate that, in terms of workforce management over the next five years, they expect to focus major resources on retaining skilled workers (65%), upskilling existing workers to use new technologies (65%) and finding new skilled workers (39%).

When it comes to more general resources, 28% of WTIA Corporate Members plan to invest in research and development. However, it seems that the introduction of advanced manufacturing techniques and technology is not a priority over the next five years. Just 24% of Corporate Members plan to devote resources to automation, 15% to robotics and 4% to 3D printing (as per Figure Four above). This profile is consistent with the industry at large: while the potential benefits offered by robotics in welding are enormous, adoption rates are quite low. It also offers WTIA members a means by which to gain a competitive advantage. While it is nearly impossible for Australian manufacturers to compete with low cost imports (particularly those from China where the hourly wage for a welder is just $1.50), Australian welders can compete on quality and efficiency. The introduction of automation and robotics to welding can play a major role in process, quality and efficiency improvements.

Similarly, Individual Members may wish to consider investing in training or upskilling in robotics and automation. Currently, just 7% of Individual Members are likely to invest in training in automation, and only 2% in robotics training (as per Figure Three above).
The WTIA’s 2018-2022 Strategic Plan

The WTIA recently finalised its 2018-2022 Strategic Plan. This is an ambitious plan designed to generate consistent growth to ensure that the WTIA is sustainable and to allow the WTIA to reinvest in the welding industry in Australia. The plan is based on the WTIA’s value proposition, as well as its mission to represent the interests of members and safeguard the public by ensuring the integrity of in-service welds. The plan will also promote the use of advanced technologies, and best practice quality and certification systems.

Certification

A major focus of the WTIA’s 2018-2022 Strategic Plan is company certification to AS/NZS ISO3834 and individual welder certification to ISO9606. Both of these types of certification are essential to securing the future of welding in Australia.

Many companies have achieved certification to ISO9001 for their quality management systems. But where a special process like welding is used, this certification simply cannot demonstrate the capability of a company to manufacture products of the required quality.

AS/NZS ISO3834 overcomes this shortfall, boosting a company’s ability to sell its products in domestic and overseas markets. And yet, Australian welding companies have so far been reluctant to adopt AS/NZS ISO3834 certification.

AS/NZS ISO3834 is the minimum benchmark for welding quality globally. As more companies become certified to the Standard, those companies without certification will find it harder to win work from local and international suppliers alike, particularly international Defence prime contractors (like Rheinmetall, Navantia), who simply expect this certification as standard.

Similarly, individual welders can expect to gain myriad benefits from ISO9606 certification, including international recognition of skills and training, through to improved employability and earning potential.

Given the importance of these certifications, the WTIA will develop and implement a number of programs to maximise certification numbers nationwide, from establishing Advanced Welder Trainer Centres through to developing new blended, e-learning training courses.

Advocacy

The WTIA has a responsibility to advocate to all levels of government and other peak industry bodies on behalf of all members.

Over the next five years, some of the issues on which the WTIA plans to concentrate include:

- Maintaining Australian market share of the total global steel fabrication market at rates above 75% (1.5Mt)
- Government funding for a national network of Advanced Welder Training Centres
- Regulations or legislation that forces compliance to Australian Standards through a properly established third-party certification scheme
- Government incentives for the introduction of welding technology associated with Industry 4.0 and contribution towards both individual and company certification costs
- A forum for the exchange of ideas and the sharing of resources
- A voice to promote the interests of the welding community and shape the market for welding services
- A pathway for learning and career development and the opportunity to benchmark against world’s best practice

Member Services

The WTIA will continue to provide high quality member services and advice. We will continue to bring individual and company members together into a collaborative community to deliver:

- Advanced Technologies

Also high on the WTIA’s priority list is new joining processes, technologies and materials.

It is through the adoption of new technologies (such as robotics and augmented reality), and new ways of performing traditional processes (such as Industry 4.0 and Advanced Manufacturing) that the Australian welding industry will be able to compete on a global scale.

In industries such as defence, aerospace and infrastructure, advanced technologies will take on even greater importance in the coming years.
DOES YOUR BUSINESS USE WELDING?

JOIN THE WTIA

The Welding Technology Institute of Australia (WTIA) is committed to supporting and advocating for Australian industry. We are dedicated to providing members with a competitive advantage through access to industry, research, education, government, and the wider industrial community.

HOW THE WTIA CAN HELP YOU

Remain diverse and resilient in ever changing and increasingly challenging domestic and global markets.

Share resources for engineering innovative solutions to enhance safety, manage risk, reduce cost, and optimise operating efficiency.

Access the WTIA’s expert advisory services, delivered by a team of highly qualified welding engineers and materials specialists. Our advice can help you increase the operational life of plant and equipment, significantly reducing maintenance and repair overheads.

Receive substantial discounts on WTIA events, seminars, training courses, certification and advisory services.

If your company is already a WTIA member, feel free to contact us to confirm that you’re an individual Associate—that way, you can take full advantage of all the benefits on offer.

NOW’S THE TIME TO INVEST IN THE FUTURE OF YOUR BUSINESS

www.wtia.com.au/membership | membership@wtia.com.au | +61 (0)2 8748 0100
Grant Ryan, Managing Director, A&B Welding

“A&B Welding was the first company in Australia to gain accreditation to ISO 3834.2. The WTIA helped us through the accreditation process quite a bit. Their technical help was essential. As a result of gaining this accreditation, we were able to target specific types of clients, such as ConocoPhillips whom we continue to supply both their onshore and offshore assets. Accreditation to ISO 3834.2 is what sets us apart from other welding companies.”

“The WTIA also brings the whole welding industry together, whether you work in the oil and gas, mining, or construction sector. They give welders a national identity.”

“Being located in Darwin can be quite isolating. For instance, we don’t get a lot of training courses in Darwin. But, the WTIA is doing its best to bring the whole country together—it has created a Northern Territory Division Committee that I am involved in, and WTIA representatives regularly try to get out and visit members in all states and territories.”

“The WTIA has adopted a new approach over the last few years, one which is definitely heading in the right direction for Australia’s welding industry.”

Louis Victor Blain, Lead Welding Engineer, Bombardier

“The WTIA supported Bombardier in developing our welding training centre. It allowed Bombardier Transportation Australia to become an accredited training centre. This support from WTIA allows us to ensure that our welders are qualified in a controlled manner to meet the ISO standard requirements.”

“Bombardier’s corporate WTIA membership offers many benefits. As a start, WTIA membership allows all of our staff to become associate members. This is great for us since it helps to develop a strong welding culture inside the company. In addition, being a corporate member allows us to use the AWCR to manage our welder certifications, and to keep an eye out for recruiting welders on the AWCR. Being a corporate member of the WTIA also allows Bombardier’s capabilities to be recognised industry wide.”

“The events organised by the WTIA are great occasions for learning and networking. Also, the magazine is a great reference to keep up with the welding industry in Australia.”

“I believe that one of the strongest roles the WTIA is fulfilling across the industry is one of mentorship and ongoing support. This applies to not only fabrication companies, but to the education system, regulations and standards.”

What Members Have to Say About the WTIA

A Snapshot: Welding Technology Institute of Australia (WTIA) Member Testimonials 2017

The WTIA’s members are made up of individual welding professionals, as well as companies of all sizes. In fact, WTIA members are involved almost every facet of Australian industry and make a significant contribution to the nation’s economy. We recently spoke with a number of our members, eliciting their feedback on our activities, services and membership benefits. This is what they had to say.

WTIA membership gives your company instant brand recognition—it demonstrates that you are a high quality supplier, which holds you in good stead throughout all industrial sectors. You definitely get broader industry recognition as a WTIA member, rather than trying to forge ahead on your own.”
“It is targeting industry needs by providing a platform for skills enhancement and knowledge sharing that ultimately provides a competitive edge to local manufacturers competing against overseas markets forces and players.”

Adam Furphy, Managing Director, Furphy Engineering

“The WTIA has been Furphy Engineering’s ‘go-to’ source for technical matters for many years. The WTIA has provided us with a range of technical advice on the interpretation of codes, standards and general compliance matters. This is particularly important for us because we manufacture a bespoke range of stainless steel tanks and associated products.”

“This means that we are usually working to one or more codes or standards, some of which have very specific requirements for welding, while others are more general in nature. There is always a correct path to take, and the WTIA has helped us determine which path that is. We also have several employees who are WTIA qualified welding supervisors. With the benefit of the WTIA accreditation, we have been able to manage most of our code requirements and welding approvals process in-house, delivering a range of benefits for both our employees and Furphy Engineering as a whole.”

More broadly, I think the WTIA plays a vital role in advocating for the manufacturing industry, as well as the fabrication and welding industry.

“Every industry needs strong and effective institutions and lobby groups that can advocate on its behalf from an objective point of view. For our industry, that is the Welding Technology Institute of Australia.”

WTIA Membership Types

- **Individual Membership**: Individual membership is open to apprentices, tradesmen, inspectors, supervisors, technologists, engineers, academics and others with an interest in welding.
- **Corporate Membership**: Corporate membership is open to all companies associated with welding or related activities.
- **SMART Industry Groups Membership**: SMART (Save Money And Re-engineer with Technology) Industry Groups identify and meet the critical welding needs of key Australian markets, such as mining, power, construction, defence, and oil and gas.
- **Free Apprentice Membership**: As part of our ongoing commitment to nurturing the next generation of skilled welders in Australia, the WTIA is pleased to offer apprentice welders free membership.
- **Free TAFE Membership**: The WTIA is proud to support, and encourage development of, Australian TAFEs and their teachers, which is why we are pleased to offer free membership to both.
“The WTIA demonstrates the benefits that the Australian manufacturing and welding industry delivers, particularly in light of compliance issues that regularly arise due to imported steel products. The WTIA’s public position on these compliance issues has been very strong, and really positive. The WTIA plays an active role in helping shape rules and regulations for Australia’s industrial sector, and calling out the issues and impacts that non-compliance can have. Their advocacy activities deliver value for everyone.”

“The entire Furphy team was very proud to be awarded the WTIA 2017 Fabricator of the Year Award. It was fantastic to receive public recognition from a body like the WTIA—a highly technical body that is very well regarded within our industry. This recognition was particularly pleasing given that our award submission focused on our recent investment in positioning the company for the coming ten to 20 years.”

Andrew Barnes, Retail Manager, Supagas

“I have been a Private Member of the WTIA for over 30 years now. Throughout this time, I have used the WTIA’s technical hotline for advice and assistance—which has always been fantastic—and I look forward to receiving the Australian Welding journal each quarter. It provides a great overview of what’s going on in the welding industry.”

“As a corporate member (in my role as Retail Manager for Supagas), one of the main benefits we have capitalised on is access to the WTIA’s online courses. The WTIA provides a range of online courses (at a discounted rate for corporate members) that Supagas sales representatives can complete.”

“These courses ensure our sales reps have the technical knowledge of welding processes and procedures that they need to better perform their roles. Other than going to the American Welding Society, there is no other way to access this type of information in Australia – the courses are very handy.”

“WTIA corporate membership also helps us better connect with our customers. Through our shared WTIA membership, Supagas and its customers often find a common ground.”

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“WTIA corporate membership also helps us better connect with our customers. Through our shared WTIA membership, Supagas and its customers often find a common ground.”

“Over the years, the WTIA has played a vital role in the nationalisation and internationalisation of Australian standards by promoting the adoption of ISO Standards and becoming an active member of the International Institute of Welding (IIW). These measures have ensured that Australia is not an isolated nation, but a player within the global welding industry.”

“More recently, the WTIA has been very vocal in supporting and advocating for the welding and steel industry, putting our case...”
directly before Government, particularly in relation to poor quality imported steel. The WTIA’s efforts in this area really have been phenomenal. Whenever I ask fabricators and other WTIA members what they get out of WTIA membership, they all mention technical advice but more often these days they are talking about how good it is that we belong to an industry body with political representation.”

Gary Lantzke, CEO, Callidus Welding Solutions

“Up until a couple of years ago, I didn’t see any value in WTIA membership. Callidus was a WTIA member, but we were not utilising our membership at all—it was just one of those things you had to do.”

Then some changes started to occur. Geoff Crittenden came on-board as the new WTIA CEO, and Louise Petrick was appointed in Western Australia. Louise understands Australia’s industrial landscape and her way of thinking is aligned with where industry needs to go for future prosperity.”

“Callidus also had a TWI industrial membership that we were not utilising at all. The time difference between Australia and the UK made accessing TWI’s resources and technical assistance too difficult. So, I approached Louise to see what the WTIA might be able offer to replace our TWI membership.”

“Not only was Louise able to tailor us a premium WTIA support package, she has been instrumental in ensuring that Callidus utilises this package to its full extent. Louise is now familiar with all our senior welding inspectors and senior managers, regularly dealing directly with them.”

“Our team is able to reach out to the WTIA’s technical representatives when we are not sure of the next step, or to reaffirm the next step. We now have a team of impartial experts on-hand to back up our own technical depth of knowledge.

“Louise and several other senior WTIA managers have also visited our facility, which is located just outside Perth. In doing so, they have been impressed with our operations, and then gone above and beyond to help promote our capabilities.”

“For instance, Geoff Crittenden commissioned an article in the Australian Welding magazine detailing our team and our operations. In addition, a couple of WTIA managers have recommended Callidus, and the quality of the work we produce, to oil and gas companies.”

“The WTIA certainly goes above and beyond in terms of looking after its members. WTIA membership used to be ‘nice to have’. It is now a vital part of our everyday operations.”
Member Directory

The WTIA is dedicated to providing members with a competitive advantage through access to industry, research, education, government, and the wider welding community. When you join the WTIA you become part of a network of engaged companies and individuals, with whom you can share technology transfer, best practices, and professional opportunities. For further information, please contact membership@wtia.com.au or 02 8748 0100.

SMART (Save Money And Re-engineer with Technology) Industry Group Members

WTIA hosts and administers the SMART (Save Money And Re-engineer with Technology) Industry Groups, providing a forum for technology transfer and R&D, linking members with industry and research organisations. The SMART groups: represent a source of vital technical welding information; optimise welding practices through standard development and tools; and assist members to prepare specifications.

AGL Energy
www.agl.com.au
131 245
customer.solutions@agl.com.au

ANSTO
www.ansto.gov.au
+61 2 9717 3111
enquiries@ansto.gov.au

ASC
www.asc.com.au
+61 8 8348 7000
David.Price@asc.com.au

Ausgrid
www.ausgrid.com.au
+61 2 4951 9555
cchiodi@ausgrid.com.au

Newcrest Mining
www.newcrest.com.au
+61 3 9522 5333
corporateaffairs@newcrest.com.au

NRG Gladstone Operating Service
www.nrggos.com.au
+61 7 4976 5211
cmcguinn@nrggos.com.au

Stanwell Corporation
www.stanwell.com
1800 300 351
www.stanwell.com/contact-us

Synergy
www.synergy.net.au
+61 8 9781 6720
Doug.Harman@synergy.net.au

Thales Australia
www.thalesgroup.com
+61 2 8037 6000
MaritimeBusinessSupport@thalesgroup.com.au

Transport for NSW
www.transport.nsw.gov.au
+62 2 8202 2200
stakeholder.relations@transport.nsw.gov.au

Vales Point Power Station (Delta)
www.de.com.au
+61 2 4352 6111
info@de.com.au

VicRoads
www.vicroads.vic.gov.au
+61 3 8391 3216
vicroadstechnicalservices@roads.vic.gov.au

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www.gdfsuezau.com
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www.gdfsuezau.com/contact-us/Contacts

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www.gdfsuezau.com/contact-us/Contacts

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+61 7 3066 6358
TMRStructuralMaterials@tmr.qld.gov.au

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Wayne.Hill@energyaustraliasw.com.au

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www.energyaustralia.com.au
133 466
Wayne.Hill@energyaustraliasw.com.au

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capital@onesteel.com

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+61 8 9410 1111
info@austal.com

BlueScope Steel
www.bluescopesteel.com.au
1800 800 789
steeldirect@bluescopesteel.com

BOC
www.boc-limited.com.au
+61 2 8874 4400
contact@boc.com

Callidus Welding Solutions
http://callidusgroup.com.au
+61 8 6241 0799
info@callidusgroup.com.au

CIGWELD
www.cigweld.com.au
1300 654 674
enquiries@cigweld.com.au

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http://coregas.com.au
+61 2 9794 2222
info@coregas.com

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www.hardchrome.com.au
+61 3 9561 9555
office@hardchrome.com.au

HERA
www.hera.org.nz
+64 9 262 2885
admin@hera.org.nz

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+61 2 8844 9100
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HRL Technology Group
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1800 475 832
info@hrl.com.au

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138 138
enquiries@mainroads.wa.gov.au

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+61 8 8116 5000
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+61 2 8925 8925
uglinfo@ugllimited.com

Water Corporation of WA
www.watercorporation.com.au
+61 8 9423 7777
darren.vile@watercorporation.com.au

Welding Industries of Australia (WIA)
www.welding.com.au
1300 300 884
info@welding.com.au

Wilmar Sugar
www.wilmarsugarmills.com.au
+61 7 4722 1972
info@wilmar.com.au

Welding Technology Institute of Australia
Welding Technology Institute of Australia
02 8748 0100 l info@wtia.com.au l www.wtia.com.au
### Corporate Members

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<td>industry.nsw.gov.au</td>
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<td>walzgroup.biz</td>
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<td>Welding Guns of Australia</td>
<td>unimig.com.au</td>
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Upcoming Events

Whether you need to brush up on skills learnt years ago, want to try your hand at something new, or crave some networking opportunities, there is an industry event for you. For further information on any of the events listed below, or any WTIA events, please email events@wtia.com.au or phone +61 2 8748 0100.

**February 2018**
The 9th International Conference on the Behaviour of Steel Structures in Seismic Areas
14 to 17 February, Christchurch
www.scnz.org

**April 2018**
EECON: National Electric Energy Conference 2018
5 to 6 April, Brisbane
www.eecon2018.com.au

NASCC: The Steel Conference
13 to 18 April, Baltimore
www.aisc.org/nascc

International Brazing and Soldering Conference (IBSC) 2018
15 to 18 April, New Orleans
www.aws.org

Structures Congress 2018
19 to 21 April, Fort Worth
www.structurescongress.org

Systems Engineering and Test Evaluation Conference
30 April to 2 May, Sydney
www.sete2018.com.au

**May 2018**
FABTECH Mexico 2018
2 to 4 May, Mexico City
www.mexico.fabtechexpo.com

National Manufacturing Week
9 to 11 May, Sydney
nationalmanufacturingweek.com.au

ICSSC 2018: 20th International Conference on Steel Structures and Constructions
10 to 11 May, Naarden
www.waset.org

**June 2018**
FABTECH Canada 2018
12 to 14 June, Toronto
www.fabtechcanada.com

XIV International Conference on Nanostructured Materials
24 to 29 June, Hong Kong
www.nano2018.org

**July 2018**
The 71st IIW Annual Assembly & International Conference
15 to 20 July, Bali
www.iiw2018.com

**September 2018**
The Australian Engineering Conference
17 to 19 September, Sydney
www.ausengcon.com.au

Australasian Structural Engineering Conference
25 to 28 September, Adelaide
www.aseconference.org.au

**November 2018**
The World Engineers Convention
18 to 24 November, Melbourne
www.wec2019.org.au

**WTIA & IIW Exam Dates 2018**
IWI B and IWI S
19 and 20 April

IWS and WTIA Welding Supervisor (AS 1796 Cert 10 and AS 2214)
13 and 14 June

For further information about IIW and WTIA exams, qualification and certification, please contact qnc@wtia.com.au.
The WTIA delivers a comprehensive range of training and certification services, all of which are designed to help Australian welders and fabrication companies achieve and maintain a competitive advantage. As the premier welding certification body in Australia, an International Institute of Welding (IIW) Authorised Nominated Body (ANB) and an Authorised Training Body (ATB), the WTIA offers a range of individual certifications, including: Welding Inspector, Welding Specialist, Welding Technologist, Welding Engineer, AS1796 Welding Supervisor Certificate 10, and AS2214 Welding Supervisor.

### 2018 WTIA Training Calendar

The practical and theoretical knowledge of the trainers was excellent, the opportunity to draw on their knowledge was fantastic.

#### International Welding Inspector - Basic

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adelaide</td>
<td>30 Apr – 4 May 2018</td>
</tr>
<tr>
<td>Brisbane</td>
<td>19 – 23 Mar 2018</td>
</tr>
<tr>
<td>Mackay</td>
<td>9 – 13 Apr 2018</td>
</tr>
<tr>
<td>Melbourne</td>
<td>18 – 22 Jun 2018</td>
</tr>
<tr>
<td>Perth</td>
<td>19 – 23 Feb 2018</td>
</tr>
<tr>
<td>Sydney</td>
<td>12 – 16 Feb 2018</td>
</tr>
</tbody>
</table>

#### International Welding Inspector - Standard

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
</table>
| Brisbane | IWI-S Part 1 – (9 – 13 Apr 2018)  
IWI-S Part 2 – (30 Apr – 2 May 2018) |
| Mackay   | IWI-S Part 1 – (21 – 25 May 2018)  
IWI-S Part 2 – (28 – 30 May 2018) |
| Perth    | IWI-S Part 1 – (2 – 6 Jul 2018)  
IWI-S Part 2 – (16 – 18 Jul 2018) |
IWI-S Part 2 – (9 – 11 Jul 2018) |

#### International Welding Specialist

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
</table>
| Brisbane | Week 1 - (18 - 22 Jun 2018)  
Week 2 - (16 - 20 Jul 2018)  
Week 3 - (20 - 24 Aug 2018)  
Week 4 - (17 - 21 Sep 2018)  
Week 5 - (15 - 19 Oct 2018) |
| Mackay   | Week 1 - (21 - 25 May 2018)  
Week 2 - (28 - 30 May 2018) |
| Melbourne| Week 1 - (16 - 20 Jul 2018)  
Week 2 - (31 Jul – 2 Aug 2018) |
| Perth    | Week 1 - (12 - 16 Feb 2018)  
Week 2 - (12 - 16 Mar 2018)  
Week 3 - (16 - 20 Apr 2018)  
Week 4 - (14 - 18 May 2018)  
Week 5 - (11 - 15 Jun 2018) |
| Sydney   | Week 1 - (5 - 9 Feb 2018)  
Week 2 - (5 - 9 Mar 2018)  
Week 3 - (9 - 13 Apr 2018)  
Week 4 - (7 - 11 May 2018)  
Week 5 - (4 - 08 Jun 2018) |

#### Welding Technology Appreciation for Engineers

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane</td>
<td>13 – 15 Jun 2018</td>
</tr>
<tr>
<td>Melbourne</td>
<td>29 – 31 May 2018</td>
</tr>
<tr>
<td>Perth</td>
<td>21 – 23 May 2018</td>
</tr>
<tr>
<td>Sydney</td>
<td>19 – 21 Mar 2018</td>
</tr>
</tbody>
</table>

#### Quality Control Welding Coordinator

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sydney</td>
<td>13 – 17 Aug 2018</td>
</tr>
</tbody>
</table>
INSIDE THE WTIA: 2018 TRAINING CALENDAR

Reinforcing Steel Welding Coordinator

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brisbane</td>
<td>14 – 18 May 2018</td>
</tr>
<tr>
<td>Melbourne</td>
<td>20 – 24 Aug 2018</td>
</tr>
<tr>
<td>Perth</td>
<td>13 – 17 Aug 2018</td>
</tr>
<tr>
<td>Sydney</td>
<td>16 – 20 Apr 2018</td>
</tr>
</tbody>
</table>

International Welding Engineer

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates (To Be Confirmed)</th>
</tr>
</thead>
</table>
| Wollongong | IWE Module 1 – (24 – 28 September 2018)  
|           | IWE Practical – (3 – 7 December 2018)  
|           | IWE Module 2 – (10 – 14 December 2018)  
|           | IWE Module 3 – (18 – 22 February 2019)  
|           | IWE Module 4 – (13 – 17 May 2019)  |

International Welding Technologist

<table>
<thead>
<tr>
<th>Location</th>
<th>Dates (To Be Confirmed)</th>
</tr>
</thead>
</table>
| Wollongong | IWT Module 1 – (24 – 28 September 2018)  
|           | IWT Practical – (3 – 7 December 2018)  
|           | IWT Module 2 – (10 – 14 December 2018)  
|           | IWT Module 3 – (18 – 22 February 2019)  
|           | IWT Module 4 - (13 – 17 May 2019)  |

The Benefits of WTIA Training and Qualification

WTIA training and certification is a strong addition to your career portfolio—it demonstrates to employers that you possess advanced welding knowledge, essential to ensuring the highest levels of workmanship. Qualification demonstrates to employers that you are dedicated to continually learning and growing in your field—qualities that are essential for success in team leadership roles, or for more complex projects.

Designed to provide an interesting and stimulating industrial perspective, all our courses is supported by a broad range of major industry groups and hundreds of Australian companies. Plus, our presenters are all International Welding Engineers or Technologists with extensive industry experience.

Further Information

For further information, or to enrol in a WTIA training course today, please contact: training@wtia.com.au or +61 2 8748 0100, or visit www.wtia.com.au.

The WTIA reserves the right to cancel or change dates of any training course due to insufficient registrations or other reasons beyond its control, and also reserves the right to refuse enrolments.

In-House Training: Have the WTIA Come To You

The WTIA can present any of its courses to your employees in-house at the location of your choosing. We can also tailor training courses specifically for your company and employees. Contact us for details.

“This is the second IWI course I have taken and on both accounts I have been very impressed with the presenters. The level of knowledge from all the teachers is impressive.”
OUR AREAS OF EXPERTISE

• Welding procedure development
• Welding coordination and management systems
• Material performance and weldability
• Welding processes and related equipment
• Welding health and safety
• Failure investigation
• Expert witness in welding and related matters
• On-site welding technology assistance
• On-site auditing of welding quality systems
• Welding codes and standards
• Inspection and testing
• Non-destructive testing
• Mechanical testing

• Heat treatment in welding
• Welding quality management to ISO 3834
• Welding specialists (IWE, IWT, IWS) for site work
• Pipelines-in-service welding, repairs and hot tapping
• Specialised welding and associated technologies (laser, ultrasonic peening and underwater welding)
• R&D and application of technology
• Engineering critical assessment fracture mechanics
• Structural and pressure equipment design
• Finite element analysis
• Weld cost estimating
• Life estimation

The WTIA has a team of highly qualified welding engineers and materials specialists available to provide expert advisory services on all welding and materials related matters. With expertise in a wide range of industries, from manufacturing to composites we have a unique capability to solve your joining problems. Our advice can help you substantially increase the operational life of your plant and equipment, thereby reducing your maintenance and repair overheads.

WTIA’S EXPERT ADVISORY SERVICES AND TECHNICAL SUPPORT: INDEPENDENT ADVICE YOU CAN TRUST

RESOURCES
INFRASTRUCTURE
POWER GENERATION
MANUFACTURING
DEFENCE

HELPING SECURE THE FUTURE OF AUSTRALIA’S WELDING INDUSTRY.

02 8748 0100  |  info@wtia.com.au  |  www.wtia.com.au  |  Building 3, Level 3, 20 Bridge Street, Pymble, NSW 2073