About the 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).

Cover Shot

FCT Flame’s Burning Sun: the centrepiece of the Pan American Games opening ceremony in Rio de Janeiro, Brazil. Construction of the Burning Sun included stainless steel sheets and a raging furnace at its core, hovering above a water-filled lake. For more information, see the article FCT Flames: The Future Burns Bright on page 30.

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From the WTIA CEO

Since last I wrote for Australian Welding magazine, advocacy has remained high on my agenda. I have tabled a supplementary submission to the Senate Inquiry into the Future of the Australian Steel Industry; briefed Federal and State Ministers on the importance of compliance to Australian Standards to ensure the safety of the Australian public; and presented a submission to the Joint Select Committee on the Federal Government’s procurement practices in relation to fabricated steel.

The consistent theme of the WTIA’s advocacy strategy is based around three fundamental goals:

1. To ensure the integrity of all welding in Australia, through the certification of fabricated steel to Australian Standards, to preserve public safety.

2. To drastically improve the practical training of our welders to ensure that Australia’s welders are certified and qualified according to world’s best practice standards.

3. To assist Australia’s welding industry to be internationally competitive by providing access to the latest technology and training.

To ensure the integrity of welding in Australia, the WTIA is advocating for regulation or legislation that forces compliance to Australian Standards through a properly established third-party certification scheme.

Whilst we are not suggesting that Australia adopts the fully regulated systems in place in Europe, the totally deregulated environment in which we work poses a significant risk to the public.

Our condemnation of bridges which do not comply to Australian Standards and are therefore deemed unsafe has been widely publicised.

However, we have also recently been made aware of manufacturing operations that are fabricating trailer and vehicle chassis without any welding quality or management systems. There is, therefore, a significant risk that there are thousands of trailers on our roads which are fundamentally structurally unsafe.

Over 30% of all fabricated steel entering service in Australia is imported. The impact this has had on welding has been nothing short of disastrous. Not only have many well-established businesses ceased to exist, but only the very largest of fabricators are employing apprentices. As a result, welding course numbers have been reduced by up to 70%. This has driven training organisations to cut costs in terms of course delivery and training staff. The combination of lack of trade opportunity and reduced hands-on welding training has lowered the overall capability of the welding community.

In addition to our efforts to drive up the quality of fabricated steel, we have also introduced the Australian Welder Certification Register (AWCR) to give our welders the opportunity for further practical training and to be able to demonstrate their competence to international standards (ISO9606-1).

Without the security of a reasonable pipeline of work, Australian companies have felt that the risk of investing in the latest technology is too great. Whilst understandable, this strategy is doomed to failure—it emphasises our competitive weaknesses in relation to the cost of labour inputs. Australia is a global leader in robotic software and some of our fabrication shops are the most advanced in the world. To become internationally competitive, as I know we can, we must invest in the latest technology. To that end, the WTIA has partnered with RTA and BOC to deliver robotic training for welders. Courses will commence in Melbourne and Brisbane in mid-2017.

I hope I have not crossed that fine line between reality and despondence; there are certainly many reasons to be positive about the future of welding in Australia. As I travel around the country meeting members, I have been impressed by the determination and ingenuity they display to adapt to the current commercial climate.

Furthermore, there is growing awareness amongst asset owners of the cost benefit of focusing on quality over price. I feel confident in saying that we are coming out of the current cycle and that the future is looking considerably better. The challenge for the WTIA is to shape the market so as to make a sustainable positive change for members.
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Officially opened during a three day onsite event in November 2016, the Applications Technology Centre contains the latest generation digital welding equipment, GMAW and GTAW arc projectors, and a Kawasaki RA 10L robot equipped with a Servo Robot PowerCam laser vision camera and EWM alpha Q 352 welding package (built by BOC’s automation partner Robot Technologies-Systems Australia).

BOC Technical Manager Peter Kuebler explained the investment will benefit both customers and BOC’s technical specialists across the nation, with the hope that it will contribute to advancements in the metal fabrication industry.

“Productivity is really important as cost pressures increase in our global economy. To assist with this, BOC and RTA have developed world leading robotic applications in Australia and are now starting to see more businesses use automation as an essential vehicle to remain competitive. Smaller customers are upgrading to digital welding machines capable of sophisticated arc characteristics and utilising innovative shielding gas mixtures.”

During the three day showcase, BOC hosted one-on-one tours, live demonstrations and consultations for customers who travelled from across Brisbane and as far as Townsville — a great start for the entire centre which aims to foster better collaboration between BOC, its partners and customers.

Located in Brisbane, the new BOC Applications Technology Centre is leading the way in industry technical expertise - igniting the future of the welding industry with state of the art training and research.
“Productivity is really important as cost pressures increase in our global economy.”

“We had a great mix of businesses attend, which shows the diversity of the metal fabrication industry — from aluminium road tankers and meat processing, to the academic and research side. They were joined by many BOC Application Specialists who were on hand to demonstrate best practice welding procedures and welding quality management.”

Several new processes attracted plenty of interest from attending guests including a special welding process developed by partner EWM for high productivity MIG welding of pipes, along with digitally modified metal transfer GMAW such as coldArc and forceArc as well as hot wire TIG.

“Our team had lively discussions with visitors around the forceArc process for high productivity MIG welding of the thick steel sections — typically this can provide productivity savings of 30% to 40%. The TIG projector, which has a brand-new compact design, proved to be a great education tool to demonstrate shielding gases on the behaviour of the arc.”

Kuebler explained the centre will also be a place where BOC can train its own technical specialists across the South Pacific in new welding and cutting applications. Training organisations will also be offered the opportunity to bring teachers and students in to see the latest technology and products being used in real applications.

With a global network of Application Technology Centres already established across the Linde Group, BOC is keen to contribute to global research and development initiatives, by using the Rocklea facility to evaluate new products and applications, and share local learnings and innovative solutions.

“Our technical experts want to encourage and support new ideas and concepts with our customers, partners and industry — a meaningful way for BOC to advance our industry and profession as a whole and to keep jobs in Australia,” said Kuebler.

Since the opening in November last year, the Rocklea Applications Technology Centre has been used extensively to develop welding procedures, train customers and staff, conduct robot demonstrations and test new products.
Inside the Industry:

Breaking News

**Ultra Electronics Secures $1.7 Million Defence Contract**

Adelaide-based defence and aerospace company, Ultra Electronics Avalon Systems, has received government funding of $1.7 million to develop and demonstrate an innovative technology to enhance Defence capability. Ultra Electronics regional director for Australia and NZ, Bernard Mills, said the funding will provide Australia with sovereign capability development and Australian workers with better skills.

“[The funding] enhances in-country skills at the high-value/high-tech end of the capability spectrum, and [the project] can be leveraged as a potential common system across a variety of current and future naval platforms,” Mr Mills said.

Minister for Defence Industry, the Hon Christopher Pyne MP said this innovation project would develop techniques to provide naval ships with early warning of incoming low flying air threats, such as anti-ship missiles. “We are determined to use the defence dollar to drive a higher technology, advanced manufacturing future. We need to ensure that we maximise opportunities for Australian industry to contribute to meeting our capability needs,” Pyne said.

**Monadelphous Secures New Contracts**

Engineering company Monadelphous has recently secured a number of contracts. In joint venture with Jacobs Engineering, Monadelphous will enter into a five year contract for engineering, procurement and construction services on Oil Search’s oil and gas production facilities in Papua New Guinea, valued at US$50 million per annum.

Monadelphous signed two new contracts with subsidiaries of Fortescue Metals, including: a three year contract for fixed plant maintenance crane services and shutdown crane services at the Solomon Hub site in the Pilbara; and a contract to provide abrasive blasting, cleaning and relining of up to 900 carbon steel ore wagons in Port Hedland.

Monadelphous also won the upgrade of the Water Treatment Plant at BHP Billiton Western Australia Iron Ore’s Mining Area C operation; a contract for the supply, fabrication, pre-assembly and delivery of structural steel, conveyers and plate work with Brolton Group at the Hanson Bass Point Quarry Expansion Project in Shellharbour, NSW; and an order to provide facilities maintenance services at the Wheatstone LNG Project for 12 months under an existing agreement with Chevron.

**Austral Delivers Pacific Patrol Boats Design Review**

Austral's Detailed Design Review (DDR) for the A$306 million Pacific Patrol Boat Replacement (PPB-R) Project has been successfully completed, formally signifying the end of the design phase and the commencement of the production phase.

A key element of the Commonwealth’s continuous naval shipbuilding strategy, the PPB-R Project is contributing to the growth of Australia’s sovereign shipbuilding capability in the lead up to the Offshore Patrol Vessel and Future Frigate programs for the Royal Australian Navy, due to commence in 2018 and 2020, respectively.

The PPB-R Project comprises the design, construction, delivery, training and sustainment of nineteen 40m patrol boats - to be gifted by the Commonwealth of Australia - to twelve Pacific Island nations as part of Australia’s new Pacific Maritime Security Program. Construction of the patrol boats will commence in Western Australia in April 2017, with deliveries from 2018 to 2023. Sustainment of the new fleet of vessels will be carried out by Austral in Cairns, Queensland.
Wood Group Launches Next Phase of Industry Collaboration into Subsea Equipment Reliability

Wood Group recently announced that it is commencing the next phase of a collaborative industry effort to develop a better understanding of the reliability of subsea equipment for use in offshore Australia.

The Subsea Equipment Australian Reliability Joint Industry Project (SEAR JIP) is an initiative led by Wood Group and supported by a group of operators including Shell, Woodside, INPEX and PTTEP. Now entering Phase IV, the project is focused on collaboration and knowledge sharing in order to improve subsea equipment design and reduce the requirement for costly and time consuming interventions in Australia’s challenging offshore warm water environment.

This latest phase of the SEAR JIP will:

- Facilitate a ‘lessons learned’ forum, where operators will share experience about equipment performance.
- Deliver a cloud-based reliability database to permit the assessment of operators’ equipment performance and comparison of vendors’ performance for equipment installed in Australian waters.
- Deliver a testing program with two streams which will benchmark the ability of different subsea electrical cable designs to block gas permeation and migration, and test new technologies to identify its effectiveness to prevent marine fouling.

Bob MacDonald, CEO of Wood Group’s Specialist Technical Solutions business said, “Wood Group has been leading the SEAR JIP since 2014. We are proud to be driving this project which is delivering a tangible step-change through strong industry collaboration, bringing together the broad expertise and experience of subsea operators, vendors and Australian research institutions to stimulate new solutions for the sector’s reliability challenges. In addition, our subsea business is using our data analytics capabilities to help improve reliability, and we hope to be able to combine these learnings with the SEAR program.”

Adriana Botto, Wood Group’s SEAR JIP project manager said, “Our focus is on generating significant cost savings by improving subsea equipment reliability through collaboration and knowledge sharing. The initial phase of the SEAR JIP underlined how important the issue of subsea reliability is and that significant cost savings could be made by mitigating issues with subsea equipment and reducing the requirement for intervention campaigns.”

Federal Government to Support Australian Automotive Industry

The Australian Government has pledged to support automotive manufacturing workers and supply chains through this transition period. The Australian Government has invested $101 million into the $155 million Growth Fund to reskill workers, diversify supply chains, and transition regions into new areas of the economy, particularly in Victoria and South Australia.

To support employees, the Australian Government committed $15 million to extend the Automotive Industry Structural Adjustment Program, which is helping automotive workers find new jobs, into 2018.

To support the automotive supply chain, the Australian Government has contributed to the $20 million Automotive Diversification Program. Designed to help firms enter new markets, this program has generated $51 million in private sector investment. The Government has also contributed to the $90 million Next Generation Manufacturing Investment Program, which is accelerating private sector investment in high value manufacturing sectors in Victoria and South Australia. It has generated over $283 million in investment.
Inside the Industry: Breaking News

**Ichthys Completes Subsea Installation**

INPEX has announced the successful installation of the complex network of subsea infrastructure and equipment required to safely and efficiently extract gas and condensate from the Ichthys Field for the world-leading Ichthys LNG Project.

The final laying of 49km of umbilicals and flying leads marked the last placement of an intricate subsea network, spread across a 400 square kilometre area of the Ichthys Field, in the Browse Basin, about 220km off Western Australia.

Included in the extensive subsea gathering system is a 110m high riser support structure, five manifolds, 139km of flowlines, 2,640 tonnes of production and MEG spools, five subsea distribution units and a subsea distribution hub. Once all commissioning activities in the South Korean shipyards are finished, the offshore facilities will be towed to the Ichthys Field and moored for their 40 year operational life by 40,000 tonnes of chain secured to more than 25,000 tonnes of foundation piles.

**Rheinmetall Shortlists Queensland and Victoria for Military Vehicle Centre of Excellence**

Rheinmetall Defence Australia has shortlisted Queensland and Victoria as potential locations for its Military Vehicle Centre of Excellence (MILVEHCOE) after receiving a first and final round of bids from state governments to secure the project.

Rheinmetall is seeking to establish a sovereign industrial capability for military vehicles in Australia to underpin an enduring strategic relationship between the Commonwealth of Australia, the Australian Army and defence industry. This capability forms part of the company’s Land 400 Phase 2 offer to the Commonwealth of Australia and is currently under consideration.

Currently the largest supplier of military vehicles to the Australian Defence Force, Rheinmetall’s MILVEHCOE will focus on the continuous design, build and support for up to 10,000 military vehicles in the Asia Pacific region, drawing on a supply network across Australia to deliver products and services locally and into Rheinmetall’s Global Supply Chain.

**Steel Sector Welcomes Industry Advocate Bill**

The Australian Steel Institute (ASI) has welcomed the South Australian Government’s plans to introduce a new Bill into Parliament later this year enshrining the role of Industry Advocate into law. ASI Chief Executive, Tony Dixon, said the Bill clearly demonstrates the South Australian Government’s continued commitment to maximising opportunities for local industry. “The planned Bill to formally recognise the Industry Advocate role will help to reinforce the Government’s appreciation of the value-add delivered by the Advocate engaging closely with local industry to generate job opportunities and support valuable skills retention,” Mr Dixon said.
INSIDE THE INDUSTRY: BREAKING NEWS

New NSW Defence Industry Strategy Launched

The New South Wales Government has launched the Strong, Smart and Connected strategy to further support Australia’s defence needs. The strategy will: foster stronger relationships across the NSW defence industry at a state and regional level; leverage the state’s strengths in critical capability areas to grow existing work and create new defence industry activity; and increase innovation, commercialisation and research.

It includes the establishment of a new central coordination body – Defence NSW. Based in western Sydney, Defence NSW will target the delivery of major projects including the Joint Strike Fighter and Combat Reconnaissance Vehicles (LAND400). The strategy will also focus on major maritime programs such as Future Submarines, Offshore Patrol Vessels, and Future Frigate maintenance services at the Wheatstone LNG Project for 12 months under an existing agreement with Chevron.

Australian Manufacturing Industry Records Strongest Performance Since 2002

A key industry report shows activity in Australia’s manufacturing sector has surged to its highest level in 15 years. The Australian Industry Group Australian Performance of Manufacturing Index (Australian PMI®) increased by 8.1 points to 59.3 in February 2017, recording a fifth consecutive month of expansion and its strongest result since May 2002.

Ai Group Chief Executive, Innes Willox said, “With manufacturing production, employment, sales and exports all growing at a healthy pace, the Australian PMI® rose to its highest level in nearly fifteen years in February. The period since 2002 has been particularly difficult for Australia’s manufacturers in the face of the phenomenal expansion of China’s manufacturing sector, extended periods of domestic currency strength and volatility in global confidence, activity and trade. So it’s great that Australia is making again."

“The surge in February builds on a recovery from the sluggish performance in the third quarter of last year and marks a fifth month of expansion. However, substantial challenges remain with further growth constrained by the lack of business investment in recent years and renewed fears about energy security and energy prices now top-of-mind, particularly for our more energy-intensive manufacturers,” Willox said.

Techstars Launches First Asia-Pacific Accelerator

Techstars has launched its first Asia-Pacific based accelerator in Australia – Techstars Adelaide.

Techstars Adelaide will support early-stage companies advancing applications in Internet of Things (IoT), big data, sensors and robotics, with potential to develop and commercialise technologies related to the defence and security sectors.

The program will connect 10 startups from all over the world to an established Techstars network of community leaders, founders, mentors, investors and corporate partners including seven of the world’s best companies: BAE, Thales, Austal, SAAB, ASC, Rheinmetall and DCNS.

Companies selected for the program will gain access to some of the most advanced technologies and research. They will also collaborate with accomplished leaders working to advance the capabilities of a host of technologies being developed by the defence and security industries.

Adelaide is poised to become a global centre of excellence for the defence sector with over $100 billion worth of major industry projects in the pipeline. Recent investment in innovation in South Australia includes a $230 million Centre for Defence Industry Capability backed by the Australian Federal Government.

ACAM 9 Call for Abstracts Now Open

The 9th Australasian Congress on Applied Mechanics (ACAM 9) will be at the University of New South Wales from 27 to 29 November 2017. The Congress aims to provide an international forum for researchers, industry practitioners, engineers and postgraduate scholars to promote, exchange and disseminate recent findings on contemporary and wide-ranging topics in Applied Mechanics.

The call for abstracts is now open, with the organisers looking for papers under a number of technical streams, including: advanced materials and structures; automated composites; bio-mechanics; bio-sustainable composites; computational mechanics; dynamics and vibration; fatigue, fracture and failure analysis of structures; fibre reinforced composites; micro and nano-mechanics; multi-functional structures and materials; and structural health monitors and structural optimisation. For more information, visit: www.engineersaustralia.org.au
Civmec Unveils Plans for Shipbuilding Facility

Through its wholly owned subsidiary Forgacs Marine and Defence, Civmec has unveiled plans for its new state-of-the-art shipbuilding facility, which will be primarily targeted at Naval Defence projects. The heavy engineering specialist is positioning itself for participation in Australia’s $89 billion naval ship and submarine upgrading program, which forms part of the Australian government’s projected $195 billion overall defence investment.

The new facility in Henderson, Western Australia will rival the best shipyards in the world and is part of Forgacs goal to enhance Australia’s profile as a globally efficient naval ship builder.

The facility will be able to house ship construction and ongoing maintenance under cover in a conducive and efficient environment close to Fleet Base West – the home of Australia’s submarine force and half of its naval surface fleet. It will be the only facility with this capacity in Australia.

With a suite of core competencies in heavy engineering, Civmec believes that these in-house capabilities, its dedicated shipbuilding facility and its securing of the strong Forgacs credibility will position the company as a force to be reckoned with for the Commonwealth Government’s upgrade and expansion programs.

Civmec anticipates an overall investment in the region of A$80 million to develop the entire facility over the coming years. Design and planning have already commenced with a more detailed focus on engineering and geotechnical analysis also underway.

The new facility will be situated on approximately seven hectares (70,000 square metres) of land adjoining the south side of the group’s existing facility at the Australian Marine Complex in Henderson. When operating at capacity, the facility is expected to provide additional jobs for up to 1,000 workers, as well as up to 100 additional apprenticeships and graduate positions.

West Australian Premier Colin Barnett congratulated Civmec on its investment, “The significant capital investment by Civmec to develop these facilities is an example of the confidence local industry has in Western Australia’s future,” Barnett said. “The Liberal National Government is supporting WA businesses to secure defence industry work and is committed to further growing the industry and securing local jobs for decades to come.”

Civmec’s Chief Executive Officer, Patrick Tallon, said, “The planning for the development of further significant facilities is all about strategically positioning the company to participate in the upcoming Naval acquisition program, the largest of its kind in Australian history, and in turn will play a major role in the company’s long-term future. We feel a standalone facility, operated by Forgacs Marine and Defence, is required to ensure there is absolutely no adverse effect to our present valuable clients that we deliver for in our other operating sectors.”

“This diversification is a natural extension of our core capabilities. The new shipbuilding and maintenance facility in Henderson will be a significant piece of industrial infrastructure, adding a new resource to the Australian maritime landscape,” he added.
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Are your tenders one step ahead of the rest? Does your team write winning tenders and proposals? Or do you need some coaching? Perhaps a little help to lift your tender writing game? With our 'Lift Your Game' tender and proposal writing workshop, you’ll be well on your way to winning new work, and getting through the selection process with flying colours. You’ll better understand what tender evaluators are looking for, and how they grade. Our practical tips and tools on writing winning bids will help you get ahead of the pack.

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1. What evaluators look for.
2. Evaluation processes and scoring systems.
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4. Bid strategy development.
5. Writing compelling executive summaries.
6. Tender templates and document presentation.
7. Developing content that differentiates your bid.
8. Writing styles, formatting, proofing and editing.
9. Getting the most out of your tender reviews.
10. Dealing with tight deadlines.

FEEDBACK FOR LIFT YOUR GAME

“The course was very informative and applicable. I will recommend this course to anyone that is involved with tendering, especially on how to structure a tender submission from start to finish. The trainer was very good and knowledgeable.”

“Great course, a well-structured course that takes you through the whole tender process in good detail. It is also interesting to see how / what the tender evaluators look out for in the industry at the present.”

“Honestly, I don’t think I have been to a better run or better presented course in all of my very long career. 10/10.”

ABOUT THE PRESENTER

Caroline Boot, MBA(Hons) BSc. Dip Tchg.Dip Math Ed.MNZIM.
Caroline is the founder and Managing Director of international tender specialist companies Plan A and Clever Buying. She is an engaging and interactive presenter and coach, giving workshop participants opportunities to consolidate the theory learned in practical, memorable and interesting ways. Caroline developed her tender training using a variety of sources, including: a track record of writing thousands of winning tenders since 1998; consultation with hundreds of tender evaluators, government, councils and consultants; and international best practice.

WORKSHOP DETAILS

Sydney 8 May 2017
Melbourne 10 May 2017

Registration Fees
• $750 (excl. GST) for WTIA members
• $850 (excl. GST) for non-members

Registration fee includes morning and afternoon tea, lunch, and all workshop materials.

To register, visit: https://net.wtia.com.au/Events
2017 National Manufacturing Week

National Manufacturing Week (9 to 12 May 2017) returns to Melbourne as Australia’s largest gathering of manufacturing industry decision-makers under one roof. Held at the Melbourne Convention and Exhibition Centre, the four day event will feature more than 50 speakers, more than 230 exhibitors and a number of networking opportunities for those working along the manufacturing value chain.

Admission to National Manufacturing Week and the Safety First Conference & Expo is free of charge for anyone with a professional or commercial interest in manufacturing and safety. To register, all you have to do is visit: www.nationalmanufacturingweek.com.au
Engineering—there are many methodologies out there that manufacturers can call upon to strategically improve their processes and productivity. These leading case studies and interactive sessions will highlight process improvement approaches in manufacturing which deliver practical increases to manufacturers’ operational efficiency and effectiveness.

Speaker Highlights

Scaling Up Australian Manufacturing – What Will it Take?
John Pollaers, Australian Advanced Manufacturing Council Chairman

Multinational enterprise coordinated global value chains make up over 80% of global trade, and the latest UN Conference on Trade and Development shows our local Australian participation rate in these global value chains is lower than 22 out of the top 25 largest exporting countries. In his keynote address, John Pollaers will explore key characteristics of successful prime and SME manufacturers, emerging market opportunities, workforce development needs and recommended government actions to grow the scale of Australian manufacturing.

A Road Map for Unlocking Future Growth Opportunities for Australia
Dr Keith McLean, CSIRO Manufacturing Director

With the world in the midst of a fourth industrial revolution, local manufacturers must adapt to a rapid pace of technological change, an increasingly international global value chain, and the changing nature of manufactured product and service opportunities. This keynote address will explore the CSIRO’s road map for transforming Australia’s manufacturing industries into a highly integrated, collaborative and export-focused ecosystem that provides high-value customised solutions within global value chains.

Australian Manufacturing Growth Centre’s Sector Competitiveness Plan
Dr Jens Goennemann, Australian Manufacturing Growth Centre Managing Director

Australia’s manufacturing sector is operating in an increasingly globalised and competitive market. Tackling the challenge of how to position ourselves well in light of this, the Advanced Manufacturing Growth Centre has released its first Sector Competitiveness Plan. Dr Jens Goennemann, will offer NMW delegates with an overview of details how the Australian manufacturing sector and its supported industries could be well positioned to add up to $36 billion to the national economy over the next ten years.

Safety First Conference and Expo

Australia’s industrial safety event, the Safety First Conference & Expo, will also be co-located with National Manufacturing Week. Themed ‘Building a safety leadership culture from the ground up’, the 2017 event will provide delegates with the latest policy and regulation overviews, practical expert advisory sessions, industry case studies, interactive workshops and live demonstrations catered to safety practitioners in manufacturing, mining and resources, construction, bulk handling and energy generation. Attendees will have the opportunity to meet a range of exhibitors, including A-Safe, JTA Health Safety & Noise Specialists, Safety Mate, Axelent, Poster Faktory and UVEX.
Introducing the 2017 Welding Technology Product Zone

Supported by the Welding Technology Institute of Australia, National Manufacturing Week’s Welding Technology Product Zone will provide a dynamic environment of live demonstrations of welding, heat-treating, joining and associated products and technologies. Read on for a list of some of the companies exhibiting in 2017.

BOC Limited, Stand 1740
For more than a century, BOC Limited’s gases and expertise have contributed to advances in industry and everyday life, including steelmaking, refining, chemical processing, environmental protection, wastewater treatment, welding and cutting, food processing and distribution, glass production, electronics and health care.

Supagas, Stand 1138
Supagas is a born and bred Australian company that has been providing gas services since 1997. They provide an extensive range of gases, including: domestic gas, HeatagasTM, helium, hospitality gas, industrial gas, LPG, specialty gas and welding gas.

Austedan Fabrications, Stand 2350
Austedan Fabrications’ passion is to design, fabricate, supply and install full turnkey dust, fume and pollutant filtration systems with exceptional results. They offer “tailor-made systems” produced in their Newcastle factory and “off the shelf” kit systems produced by the world renowned experts - Camfil Farr.

Lincoln Electric, Stand 1546
Lincoln Electric is a global manufacturer and one of the best in producing the highest quality welding, cutting and joining products. Their new world class customer experience centre and applications lab are staffed with a team of engineers, metallurgists, and technicians.

Gulco, Stand 1646
Gulco excels in the design and manufacture of Extrusion Tooling for multiple-layer applications for Medical, Automotive and Industrial tube and hose products. With nearly a half century of experience producing Extrusion Tooling for plastic and rubber in the USA, Gulco has developed a number of patented and proprietary tooling features leading to unique solutions for the extrusion process.

Saint-Gobain Speciality Firms, Stand 1930
Saint-Gobain Specialty Firms has over 40 years expertise offering the broadest line of high-performance polymeric films, membranes, coatings and laminations worldwide. Their custom solutions deliver the optimal combination of temperature, chemical, release, friction, purity, and dielectric performance in a variety of applications and markets.

Busicom Solutions, Stand 1140
The Busicom Group provides a comprehensive solution for welding quality assurance and trade resourcing needs. These include supply and maintenance of trade skilled and semi-skilled labourers, qualified welding crews, verification of competencies through workplace assessment, third party welding inspection of welded fabricated items and a Customised Welding Quality Assurance Program.

Inductotherm, Stand 1436
Bringing together 40 companies with 38 manufacturing facilities located in 19 countries, Inductotherm Group delivers innovative products throughout the world. They design and manufacture the most advanced induction melting furnaces for induction melting, holding and pouring for virtually all metal and material processing including iron, steel, copper, aluminium, zinc, and reactive and precious metals.
TeSuCo, Stand 1426

TeSuCo, (Technical Supplies Company) is a privately owned Australian company based in Sydney since 1988. TeSuCo supplies a wide range of gas equipment to the industrial, plumbing, HVAC, scientific, medical and beverage industries. The range includes regulators, manifolds and gas welding, cutting and heating equipment, disposable gas cylinders for welding, oxygen and nitrogen.

Klingspor Australia, Stand 1530

Based in Germany, Klingspor has been manufacturing high-quality abrasive technologies since 1893, and is the inventor of the flap disc and the cutting and grinding disc. With 11 highly skilled field sales staff in Australia, Klingspor are at the forefront of abrasive technology when it comes to cutting, grinding and surface finishing, all provided with exceptional levels of customer service and support.

Metal Science Technologies, Stand 1736

Metal Science Technologies has a range of weld cleaning machines, which suite any type of stainless fabrication. Their machines and processes have been evaluated by the University of Newcastle and the University of Wollongong, and tested by Sandvik Material Testing. Their stainless steel cleaning units deliver the highest corrosion resistance benefits possible compared to mechanical finishing, pickling paste and AC cleaning.

Magnet Sales Australia, Stand 1836

Magnet Sales Australia are experienced manufacturers and suppliers of industrial magnets for welding and lifting applications. The MSA stand will hold a vast range of magnetic solutions featuring safety in the workplace, including Magswitch products, the cable safety range, a mini demo-sized overbelt separator and magnetic brooms.

Ensitech, Stand 1930

Ensitech is an Australian-owned manufacturing company based in Western Sydney. It is the award-winning developer of the TIG Brush® Stainless Steel Weld Cleaning System, a comprehensive range of products for the pre-weld preparation, post-weld cleaning and surface finishing of fabricated stainless steel products. The TIG Brush cleans and passivates stainless steel welds without the need for dangerous chemicals, such as pickling paste.

Coral Group, Stand 1236

For over 50 years, Coral Group has been a leader in the design and construction of air filtering systems and plants for welding fume extraction. Coral Group currently comprises 23 companies, which specialise in a range of air extraction and filtration, air purification and noise treatments engineered specifically for industrial purposes.

Welding Technology Institute of Australia, Stand 1642

The WTIA will be manning an exhibition stand throughout NMW. Be sure to visit us at Stand 1642 to discover how we can help you substantially increase the operational life of your plant and equipment thereby reducing maintenance and repair overheads.

Controlling Costs in Welded Fabrication

In civil structures, fabricated steel is losing ground to concrete, a problem that is exacerbated by the fact that Australian fabrication is losing ground to imported fabricated steel. These changes are due, in part, to the high cost of domestic fabricated steel products, with Australia’s expensive raw materials, and higher local wages and overheads. However, there are some costs that welders can control during the fabrication of metal structures, the most important of which is re-work.

There are many cost elements associated with welded fabrication – some under the control of the client (the purchaser or operator of the fabrication) and some under control of the fabricator.

Purchase of Metals

The purchase of metal (particularly as the cost of steel and aluminum continues to rise), is the chief cost that must be controlled by the fabricator. Three options to control material costs are:

- Have the client purchase the steel. This is a win-win situation: the client will have better purchasing power than the fabricator and should be able to secure a reduced cost.
- Create a payment schedule that ensures that the materials are paid for by the client as soon as they arrive with the fabricator.
- Negotiate a deferred payment plan with the metal supplier so that the material is paid for once it has been fabricated and shipped to the client. Steel suppliers are usually willing to comply—they understand the importance of a robust fabrication industry if the steel supply industry is to survive.

Specifications

Fabricators should rely on national standards (such as AS1554.1 for steel structures or A 1665 for aluminum structures) to guide the fabrication process, rather than relying on or produce new client-specific welding procedures. The time it takes to understand and tailor client-specific procedures will add considerable time to the job and increase the likelihood of non-compliance. The return on investment is not usually worthwhile for a ‘one-off’ circumstance.

Design

Designs should be based on standard truck loads (20 tonne lots), with the structure able to fit inside standardised truck load dimensions. These loads will make for ease of shipment and prevent problems related to wide load permits. Make sure that each shipment is fully self-contained, with all the required brackets, fasteners in the one shipment.

“Design with ease of fabrication and erection in mind to make the fabrication process much more cost effective. Create joints that can be made in the flat position and use simple, standardised connections wherever possible.

Don’t optimise designs to minimise weight, as this often creates unnecessary complications. An example of such complications is the inclusion of different sized plates, webs and flanges. Including these elements can often lead to an increase in the amount of stiffeners required, as well as an increase in the number of feed plates and joint configurations. This can lead to non-conformities in the fabrication and increase the number of plates and welding procedures that are required to complete the fabrication.

Fabrication Drawings

High productivity welding generally requires that welds are made in the Flat 1G or 1F welding position. It is also necessary to determine a welding sequence to control weld distortion, so fabricators should keep the following in mind:

- Weld placement
- Reducing the quantity of weld metal required: narrow gap welding and high penetration welding techniques
- Reducing welding runs
- Sequencing and balancing the welding control distortion

Cutting and Stripping

Wherever possible, minimise cutting and stripping, and contract these activities out. Specialist providers use CAD/CAM in their laser and plasma cutting operations, which enables:

- Cost effective nesting of parts, to enhance material utilisation
- High accuracy in cutting, for good fit up
- Laser marking of cut pieces, for enhanced traceability

Preparation Schedule and Critical Path Analysis

Fabricator initiated delays due to poor scheduling or the inability to recognise the critical path delivery is disastrous for two reasons. The overrun will eliminate profits (as the project is likely to have been costed based on a specific delivery timeframe) and, the reputation of the
fabricator can be tarnished. Production plans must be made for every project, with all major purchases identified, delivery dates noted, and all marking, cutting, jiggling, fabrication, testing and delivery activities outlined. Once production plans are in place, critical path activity(s) should be identified, with contingency plans created to ensure the project remains on track.

**Welders**

The relatively high labour rates in Australia compared with neighbouring countries in South East Asia essentially require Australian welders to be twice as productive as their foreign counterparts to remain competitive. The following can assist in improving welder productivity:

- Ensure all welders maintain their qualification status by using their qualified welding processes regularly.
- Avoid having to qualify welders prior to each job – welders should be continuously qualified.
- Train all welders how to perform macro examinations so that AS1554 welding procedure and welder qualification can be carried out in-house.
- Avoid using outside laboratories for welder qualification tests.
- Introduce an incentive payment scheme based on the amount of code compliant welding produced by each welder.
- Monitor welders performance and establish quality benchmarks.
- Train all welders in welding inspection (leg length, undercut etc) so they can self inspect to identify and rectify flaws.
- Train all welders in the operation of their specific welding machines so they can perform routine troubleshooting and maintenance activities.

**Productivity**

Consider the following factors to improve productivity:

- Review the drawings carefully and identify areas where welding will be difficult – negotiate with the designer or client to determine if alternative weld designs are possible.
- Rotate all fabrication so that down hand welding is possible.
- Use Submerged Arc Welding when possible.
- Eliminate back-gouging and back-grinding from the production activities – it is a sure sign that welding procedures have not been developed properly.
- Avoid manual metal arc welding – the productivity of MMAW is so low that this is in fact a very expensive process.
- Utilise narrow gap welding bevels to minimise distortion and maximise productivity.
- Submerged Arc and Gas Metal Arc welding can be adapted for narrow gap welding.
- Use the correct welding consumable diameter for the right application.
- Avoid re-work: ensure welding procedures have been adequately tested. Avoid qualifying the welding procedure under ideal conditions with the ‘best’ welder – be realistic.

For more hints, refer to the WTIA’s Technical Guidance Note Four: Controlling Costs in Welded Fabrication, available via www.wtia.com.au
What Is a Confined Space?
Confined spaces present a unique health and safety problem because the hazards contained within may not be readily apparent. Confined spaces usually have poor ventilation, and with their small volume hazardous atmospheres accumulate quickly. Work in confined spaces can increase the risk of injury or death by requiring that welders work closer to hazards than they would normally, or by creating additional hazards such as engulfment.

In the welding and fabricating industry, the majority of confined space work occurs when a plant is in a turn-around, shutdown or outage situation. Some common tasks include vessel repairs, welding pipelines or tank seams, and the cutting and removal of unused tanks.

The Major Dangers and How to Control Them
The dangers of welding in confined spaces are very similar to those that apply to welding in any time or space, only heightened. Some hazards become more intense and require more attention, particularly ventilation, the maintenance of a safe working atmosphere, falls and entrapment, electric shock, fire or explosion, and radiation or heat problems.

Asphyxiation
Confined spaces are often poorly ventilated. Fumes and gases can build up, reducing oxygen supply and eventually causing asphyxiation. This is one of the hardest dangers to detect as the presence of flammable, toxic, explosive and inert gases can often go unnoticed. Welders will assume the area is safe and not notice anything until it is too late.

Confined spaces must always be tested before they are entered. A person’s senses should never be used to determine if the air in a confined space is safe. Many toxic and flammable gases cannot be seen or smelt and the level of oxygen in the air cannot be determined using one’s senses.

Instead, initial testing should be completed from outside the confined space by inserting a sample probe at appropriately selected access holes, nozzles and openings. As it is possible for contaminants to settle at different levels, the top, middle and bottom of the space should be tested. For example, some gases (such as hydrogen sulfide) are heavier than air and in unventilated areas will settle to the bottom of the space, while other gases (such as methane) are lighter than air and will collect at the top of the space. Tests need to be made at a sufficient number of points to accurately reflect areas of the space that are likely to be accessed. For a confined space to be fit for entry it must have 21% oxygen and contain no explosive, flammable or toxic gases or vapours.

Poor Exit and Entry Points
Dangers of falling and becoming trapped are heightened in confined spaces. Welders need to pay extra attention to their footing and the condition of the entry and exit points in confined spaces. Floors also need to be dry and clear of grease and oil.

Electrical Shock
If the confined space is constructed from metal, then it will be part of the welding circuit—some parts may even be electrified. As such,
it is essential that adequate planning is undertaken. The welder must know which parts of the vessel are electrically safe. In addition, the welder should be insulated from the workpiece and dry-grounded.

**Heat and Radiation**
Heat and radiation can be issues when welding in reflective alloy or metal spaces. The intensification of UV rays heightens the possibility of arc flash and burns. It’s important that radiation and heat shields are used, and that welders carry extra fluids to prevent dehydration.

**Fire**
As vapours and gas build up in confined spaces the risk of fire and explosion becomes a very real possibility, particularly when combined with the sparks caused by welding and cutting. Welders need to check all equipment for leaks and make sure that any sources of gas or vapour have been switched off before they start welding and cutting. Most importantly, oxygen should never be used to enrich an atmosphere, as it is a severe fire hazard.

**Creating a System To Keep Your Welders Safe**
Under the *Occupational Health and Safety Act 2004*, every employer has a responsibility to keep their employees safe. While specific OH&S regulations differ from state-to-state, they all have one thing in common: an emphasis on risk management. All welders working in confined spaces must follow a documented welding procedure that measures and mitigates potential risks. It should include questions such as:

- What is the space used for?
- Will extra ventilation be necessary to cope with insufficient air flow?
- Are there physical hazards that need to be cleared or chemical hazards that need to be removed?

OH&S regulations also state that documented emergency procedures must be in place, and every welder entering a confined space must know exactly what to do in an emergency situation. Equipment must be maintained to the highest standards, and welders should not work in confined spaces alone. Every welder should have a ‘buddy’ to work alongside.

For further information, refer to AS 2865-2009: *Confined spaces*. This Standard sets out the requirements and risk control measures for ensuring the safety of those who must enter or carry out tasks associated with a confined space. It includes planning and implementing entry to a confined space, as well as guidance for training, risk assessment, and atmospheric monitoring.
The Changing Face of Australian Standards

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. The last few months have seen a variety of reviews take place, particularly in relation to Standards that pertain to structural steel welding, fusion welding of steel, welding of boilers and pressure vessels, and pressure equipment.

Structural Standards

Recent meetings of the Standards Australia Structural Steel Committee WD-003 have resolved to prepare a minor text amendment to AS/NZS 1554.3 Structural steel welding – Welding of reinforcing steels. The draft amendments are currently being prepared and will be released for public comment shortly. The Committee has also resolved to prepare correction amendments to parts 4 and 5 of AS/NZS 1554, primarily in section 6 of both standards. Other items that require correction will also be addressed at the same time.

More recently, WD-003 has resolved to revise AS/NZS 2980 Qualification of welders for fusion welding of steel in conjunction with the planned adoption of ISO 9606-1 Qualification testing of welders - Fusion welding - Part 1: Steels.

It is likely that AS/NZS 2980 will refer to the Australian edition of ISO 9606-1 for test methods and application requirements, with items relevant to specific Australian and New Zealand requirements retained within AS/NZS 2980.

Longer term, it is anticipated that AS/NZS 2980 will be superseded by ISO 9606-1, particularly given the recognition of the latter in...
As WTIA members would be aware, in 2016 a call for volunteers was made by the WTIA to revise this standard. As a result, a working group has been formed and work has commenced. The interim reconfirmation of AS 3788 affirms the importance of this document to the pressure equipment industry. It will also allow the working group to prepare a working draft for review and publication in due course.

ISO Standards

In compliance with standard ISO practices, ISO 9606-1 Qualification testing of welders - Fusion welding - Part 1: Steels is currently undergoing the requisite five year review. The outcome of the review will either see the standard reconfirmed, or will result in the initiation of a revision. In the interim, Australia will adopt ISO 9606-1 as an Australian Standard, and discussions are underway regarding collaboration with New Zealand on an AS/NZS ISO document. ISO 9606-1 is currently referenced in a number of Australian standards, including the AS/NZS 1554 series and AS/NZS 3992. It has been recognised within ASME IX since 2012.

ISO 14731 Welding coordination – Tasks and responsibilities is currently being revised by ISO and the DIS (draft) edition was circulated in late 2016. Comments are currently being compiled and will be reviewed by the drafting committee, most likely in May. Whilst there were some significant changes from the previous edition, in line with ISO policies, the overall principles of the standard will remain unchanged.

The WTIA is maintaining a watching brief on a number of other ISO standards, given the direction of the Australian Government in considering tenders for the Navy frigate program. The three tenderers are all European based, as is the successful tenderer for the submarine program. As such, it is likely that Australian fabricators bidding for work on these projects will need to comply with either ISO or EN/ISO standards.

Aged Standards Review

Standards Australia has resolved to reconfirm many of the aged standards commonly used by Australian industry including the series of standards within AS 2205 Method for destructive testing of welds in metal. In the coming months though, a small number of the reconfirmed standards are likely to be reviewed, with the intent being to assess their suitability for replacement by their ISO equivalents in some form.

WTIA Technical Note 11: Commentary on AS/NZS 1554 (2016 Revision)

A reminder that the technical revision of WTIA Technical Note 11 Commentary on the Structural Steel Welding Standard AS/NZS 1554 is complete. The new, revised version of the Technical Note is now available for purchase via the WTIA’s online shop (via www.wtia.com.au).

The Technical Note complements AS/NZS 1554, presenting background information which could not be included in the Standard. It discusses the requirements of the Standard, particularly new and revised clauses, and emphasises the need to rely on the Standard to achieve satisfactory weld quality.
Leading the Charge in Welding Robotics

Robot Technologies Australia (RTA) has been the leading robotics systems integrator in Australia for over 30 years. Since its inception, RTA has found ways to help enterprises reduce costs, save time and increase safety by automating time-consuming and repetitive manual tasks. Partnering with leading robotics brands such as robotics brands such as Nitta, Kyokutoh, Sick, Staublie and Kawasaki, RTA has made their name on the back of their ability to deliver key efficiencies to companies across a myriad of industries.

The Story of RTA

"Robot Technologies was established by my father in 1986. In the beginning, we primarily had an automotive base but over the last five years, with the closure of much of Australia’s automotive industry, we have diversified into the food and beverage industry, as well as small manufacturing,” said Trinton Smith, RTA’s General Manager.

“We buy robots from companies like Kawasaki. Then, when a client wants it integrated into their operations, we customise a package for them—we adapt the robot to perform the specific tasks required by the client."

“The thing is, about 70% of the time, our clients don’t know exactly what it is that they want. All they know is that they’ve looked at their process, and they know that it can benefit from a robot. So, we undertake an in-depth feasibility study on their behalf. We determine whether a robot is going to give the client bang for their buck. We work out whether a robot is capable of performing the job, and what processes the client might need to change to suit robotic technology,” said Smith.

Robotics Innovation

While Australia might not be a leader in the global robotics industry, it has contributed some innovative, world-leading applications. RTA and BOC are responsible for one of these applications, creating a robot welding system that relies on intelligent laser vision.

The robot is capable of making adaptive maintenance welds on heavy mining trucks and dump truck bodies. The robot is portable and uses a laser camera to make multi-pass weldings and cope with complex weld joint geometry, delivering significant improvements in quality, productivity and safety.

This project is enormously important for the mining industry. After the record-breaking boom, iron ore and coal prices have sharply declined placing enormous pressure on the mining industry and its ability to generate profits. In order to cope with this, the mining industry has reached out to robotics as a way to deliver the types of efficiencies that can create profit during difficult economic contexts. The importance of RTA and BOC’s contribution cannot be undersold. The cost of labour and the downtime associated with having vital vehicles out of action has been addressed by this incredible piece of technology.

Advanced laser seam tracking has evolved into intelligent laser vision. The camera requires just three calculations to recalculate the welding trajectory in 3D or 6D, allowing seam-finding to occur in a matter of seconds. As Smith puts it, “Robots are deaf, dumb and blind. Laser vision gives robots eyes to see”.

“Robotics are only useful if they can mimic and improve upon the work that human beings can do. If it takes a robot longer to complete a weld, then it doesn’t create the efficiencies that it was designed for. The laser vision provides the eyes and the software and algorithms provide the mind that is necessary for robots to be useful,” said Smith.

“It is the repeatability and the ability of intelligent robotics to move closer to perfection—through the removal of human error—that makes robotics truly useful.”
If the algorithms have been set up properly a robot will complete a task in the exact same way each time. No matter how highly trained or skilled there will always be differences when human beings complete the same task a number of times.

Smith also points out that by employing robotics, there are less occupational health and safety issues, with people redeployed into areas that are less strenuous and carry less risk.

This is an important point to make, with the rise of robotics often tied to the loss of jobs. Welders previously charged with maintenance work can now be deployed in more technical areas where robotics simply can’t replace the eye of a craftsman.

**The Future of RTA**

According to Smith, the greatest challenge lies in “getting the owner or the production manager to share the vision of automation. If they don’t have that vision, it doesn’t matter how many benefits you list or how quick the return on investment is—it will simply never happen. Welding automation has to be joint venture”.

For Smith, the future of the robotics industry is heading towards a space in which robots and humans work together. “Robots are getting smarter. They are constantly evolving and the last ten years they have evolved at a rate that we’ve never seen before,” said Smith.

With technological advancements such as laser vision being integrated into welding robotics, the benefits of automation are clear. Welding operators need to understand that their experts can make even greater contributions to productivity and profitability if they aren’t confined to performing repetitive, strenuous and, at times, high-risk tasks.

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**Global Trends: Robots Transforming Productive Processes**

In 2015, robot sales increased by 15% to 253,748 units—by far the highest level ever recorded for one year. The main driver of this growth was general industry, with an increase of 33% compared to 2014. By 2019, some 2.6 million robot units will be working around the world. That’s another 1.4 million new industrial robots on today’s figures, according to the latest forecast from the International Federation of Robotics (World Robotics 2016 Industrial Robots Report). Nearly three quarters (70%) are in the automotive, electrical, electronics and metal and machinery sectors.

Australia and New Zealand have immaculate pedigrees in the highly competitive food and beverage industries, which are continuing to invest heavily in robotics automation to increase efficiencies, productivity and product quality. While packaging and materials handling has traditionally been the focus for robotics applications within the food and beverage and pharmaceutical industries, the development of food-grade articulated robots that are able to handle raw food in processing applications have seen increasing investment in this area.
SMW Group Introduces Robot Welding System

The Challenge
A downturn in profitability across the mining sector caused by decreasing iron ore and coal prices has placed increasing pressure on suppliers like SMW Group to reduce costs for mining and haulage equipment maintenance, repair and remanufacturing.

This was a challenge for SMW, as the maintenance and repair of buckets and truck trays required significant welding hours due to large quantities of weld metal and pre-heat temperatures of over 200°C.

Safety measures to prevent operator injury, fatigue and heat stress also contributed substantial time and cost. With all this, it was not uncommon for a single dragline bucket repair to take upwards of 2,000 man hours of welding.

Automation of repair welding had not been considered feasible due to the size and geometry of the equipment, as well as the damage, distortion and uneven wear of components.

“It wasn’t until we met with BOC and RTA that we were able to find a solution that could meet the demanding welding procedures required for this type of work,” said Jack Trenaman, SMW Group Managing Director.

The Solution
To kick off one of the most complex automation projects they had worked on to date, RTA and BOC conducted in-depth feasibility trials followed by an extensive research and development process – crucial to the ability to deliver a unique customised robotic system that suited SMW’s welding procedures.

Utilising advanced laser seam tracking, adaptive welding software, a new generation welding system and a modular robot configuration, BOC and RTA built and installed the robot welding package and provided training for all SMW operators.

The portable robot cell is the most versatile multi-process welding robot in the world – comprised of a Kawasaki RA 15X robot equipped with a Servo Robot PowerCam laser camera and an EWM Phoenix 552 welding package, supplied exclusively by BOC. SMW’s robot is supplied Argoshield from a BOC CRYOSPEED Mix Onsite system.

Built on a modular base, the robot can be positioned on, beside or beneath the component being welded, and utilises real-time laser seam tracking to enable multi-pass welding and to cope with complex weld joint geometry. The welding solution and integrated software enable live monitoring and real-time analysis of welding procedures and data storage.

To minimise programming time, RTA developed world-leading technology to convert encoded data from a DXF file into data that allows the robot to scan and weld any type of weld geometry. The SMW operator only needs to ‘teach’ the robot where the piece was located in space; the robot then uses the laser camera to scan the part and build weld paths based on data in the DXF file.

The Benefits
Since installing the welding robot, SMW has reduced its welding time by between 70% and 90%. It has also reduced overall production costs, improved safety, quality and reporting, and broadened its scope of work capabilities.

“We noticed the benefits straight away – our team can now complete a specific welding task in just 30 hours, made up of 20 hours of robot welding and 10 hours of man labour. That same task previously took 120 hours of man-only weld time,” said Trenaman.

“Our welding robot has dramatically increased our production capabilities, improved safety and quality, and reduced costs. BOC and RTA have helped set us apart from our competitors – no one else is doing this type of work with robots in Australia.”
INSIDE THE INDUSTRY: PROJECT SPOTLIGHT

RTA’s robot system for adaptive maintenance welding at SMW Group.

“The real standout for our customers has been the consistently top quality of the weld – and greater quality assurance documentation. We can now access live detailed reports on temperature, gas flow, voltage and amps at any point in the welding process – all by logging in from a mobile device.”

The robot has also eliminated the risks of fatigue, heat stress and working height restrictions, minimising risk of human injury and the need for ergonomic access planning. Commercially, it has boosted overall productivity, while reducing labour and associated personal protective equipment (PPE) costs.

“Everyone at SMW has witnessed the robot’s potential and we’re fully invested in setting it up for continuous success.”

About Servicing, Maintenance and Welding (SMW) Group

SMW Group has been a proud Central Queensland provider of field servicing, maintenance, and emergency repair and rebuild services for over ten years. The company provides complete plant and equipment management for projects large and small. SMW’s management team has more than 60 years of combined industry experience and is recognised for efficient and quality service in servicing, maintenance and welding projects. The company supports this service by delivering a range of mine site compliance activities and providing experienced on-site and project based staff. SMW makes industry move. For information, visit: www.smwgroup.com.au

About BOC

BOC is a member of The Linde Group which supplies compressed and bulk gases, chemicals and equipment around the globe. The company develops safe, sustainable and innovative solutions for customers in many specialty sectors, heavy industry and medical environments. For more than a century the company’s gases and expertise have contributed to advances in industry and everyday life, including steelmaking, refining, chemical processing, environmental protection, wastewater treatment, welding and cutting, electronics and health care. For further information, visit: www.boc-limited.com.au
Stainless Steel Electropolishing: Saving Time & Money

When it comes to restoring the corrosion resistance of stainless steels, there are many methods available, from pickling and passivation right through to mechanical abrasion. However, developments in electropolishing have led to a safer and more time efficient method for cleaning and matching stainless steel finishes.

The excellent corrosion resistance of stainless steel can only be achieved if proper cleaning and finishing operations are carried out after any fabrication process as there will have been damage to the surface condition.

A means by which to undertake this finishing of stainless steel, electropolishing is an electrochemical process that increases density of the chromium throughout the treated area and therefore the ability to create an oxide film. The corrosion resistance of stainless steel arises from a chromium oxide film that forms a protective layer naturally on the surface of the steel.

The high temperature of welding results in severe chromium depletion not only at the weld surface but throughout the heat affected area. Removing surface material such as oxide film is therefore only half the job as the weld area is still chromium depleted relative to the parent stainless steel. critically, when the weld is depleted of chromium its corrosion resistance is severely reduced and the weld may also lose its reflectivity and cosmetic appeal.

Electropolishing selectively dissolves the microscopic high points of the stainless and selectively removes iron so increases the chromium density and creates a microscopically smoother surface on which bacteria contaminants cannot bind or hide.

The traditional and widely used process of pickling will typically take more time than DC electropolishing machines.

Pickling is the process of removing weld scale from the surface of a finished weld by cutting away some of the layers that have been affected by the weld through the use of acid concentrations.

Acid pickling is a hazardous procedure with both human health and environmental issues to be considered due to the toxic acids used in the various processes. If not carefully controlled, acid cleaning can also cause damage to the surface of the welded object, and may result in further contamination on the treated areas. Acid concentrations, temperatures and contact times must therefore be closely monitored and controlled in relation to the treated alloy.

When following health and safety regulations, the setup, use and disposal of all pickling pastes becomes a costly exercise, both in terms of time and money. And, although pickling removes the oxide scale, the weld area is still chromium depleted when compared to that of the parent metal.

Research completed by the Intelligent Polymer Research Institute (at the University of Wollongong) shows that welds cleaned with direct current electrochemical brushes, like the EASYkleen, have significantly better corrosion resistance than pickling paste, or an electrochemical cleaning brush using alternating current. According to the Intelligent Polymer Research Institute, “Welds cleaned with an EASYkleen Plus using DC have significantly better corrosion resistance due to reduced micro scale and removal of large grain boundaries which lead to pitting (corrosion) than Pickling Paste and an electrochemical Cleaning Brush using Alternating Current AC. AC also show signs of contamination”.

This increased corrosion resistance is due to reduced micro scale and removal of large grain boundaries which lead to pitting (corrosion) on the steel surface. Electropolishing machines have been designed in response to these studies, and when used correctly result in a cleaner weld finish. By using DC, the machines selectively dissolve the microscopic high points of the stainless and selectively remove iron.
Studies have also found that DC electropolishing improves the chromium density at the welded area beyond that of the parent metal. This means that the days of the ‘tea stain’ weld zone are over.

According to Dr Ian Ward, Technical Manager at Sandvik Materials Technology, “The largest improvement in corrosion resistance was demonstrated by the mepBLITz with the carbon fibre brush, which exceeded the performance of the pickling paste and returned the overall corrosion resistance of the entire weldment close to and in some areas exceeding that of the parent metal.”

This DC technology uses food grade acid, which means that any fumes produced are innocuous. These machines are also highly mobile and need little preparation time.

About Metal Science Technologies
Metal Science Technologies offers a range of weld cleaning machines and associated products, all of which have been designed with university collaboration to produce the most corrosion resistant finish possible.

In the past, electropolishing could only be performed by the immersion of the work piece in electrolyte solution, which wasn’t always possible, practical or cost effective.

With the EASYkleen line from Metal Science Technologies, it is now possible to weld on-site or in the workshop and only seconds later finish the weld with an amazing chromium dense mirror-like sheen. The machines require minimal labor time and thus yield faster production than other cleaning processes.

The process uses a food grade acid that combines a citric and phosphoric acid with several sequestering agents to deliver a dramatic improvement in operator safety.

The EASYkleen machines return the characteristic properties of stainless steel to maximum effect leaving it chromium rich, metallically clean and free from stress, smoother with reduced microscopic cracks, minimum absolute surface area, and chemically passive.

Cross-section of an untreated stainless steel weld.

Weld treated by electro-polishing.  Weld treated with pickling paste.
FCT Flames: The Future Burns Bright

It’s a relatively little-known fact, but since the Sydney Games in 2000, many of the Olympics torches and cauldrons have been designed and constructed by Adelaide company, FCT Flames. World leading flame technology specialists, FCT Flames dominates the ceremonial flame market, and has provided torches, cauldrons and spectacular flame displays for almost every major games in the world, including the Athens, Beijing, London and Rio Olympic Games, the Toronto Pan American Games in 2015, the South East Asian Games in Singapore, and the First European Games in Baku in 2015.

The 2000 Sydney Olympics

Sports fans from all around the world remember when Australian Cathy Freeman lit the Olympic cauldron in Sydney. But no one remembers this moment more clearly than the team at FCT Flames. This was a game-changing moment for the Adelaide company, which has gone on to design the flames equipment for the Games since 2000, including the Rio Summer Olympics in 2016.

According to David Retallack, Chief Executive Officer of FCT Flames, they never set out to corner the ceremonial flame market.

“When we started in 2000 with the Sydney Olympics and Cathy Freeman lighting the cauldron, I don’t think we ever dreamt that we’d be in this position 17 years later as the preeminent supplier of cauldrons at major sporting events.”

“It was our first event, our biggest event in terms of exposure to the world. Billions of people watching. Everyone was so proud, and relieved that everything had gone to plan,” said Retallack.

FCT was commissioned by the Sydney Organising Committee for the Olympic Games (SOCOG) to develop a combustion system for the Games Relay Torch and worked with research partner, the University of Adelaide, to meet the challenge.

According to Retallack, the specifications for the torch were quite extensive, “It had to stay alight in winds up to 100km per hour, stay alight in rain up to 2 inches per hour, and had to be able to run for up to 15 minutes.”

SOCOG’s design specifications also required that the flame was highly visible to spectators and the media; had low environmental impact through minimum fuel usage, the use of readily available fuels and materials, and no toxic emissions; was safe for athletes and surroundings; and was simple and low cost to manufacture.

These specifications, particularly the environmental criteria, were significantly stricter than for previous torch designs. FCT and the University of Adelaide therefore conducted an extensive research and development program to develop a unique fuel and combustion system that performed

Following the completion of the Sydney 2000 Olympic and Para-Olympic Games, the main stadium cauldron was relocated to Overflow Park, adjacent to the stadium. FCT assisted in moving the cauldron and burner cartridge, and redesigning the burner control system and valve train to cater for the permanent nature of the installation.
to SOCOG’s expectations. This program resulted in the development of a liquid draw fuel system and the patented crinkle burner combustor.

“We were given quite a sleek design. There was not much space in that design to fit a burner and a fuel system. So it was quite a challenge, with our research partner at Adelaide University, to design that burner system. That was our first foray into the Olympics, which lead onto designing the cauldron as well,” said Retallack.

FCT went on to supply the burner system, valve train and control system for the Sydney Olympic Stadium Main Flame. Work began with the construction of a scale model of the Main Stadium that mimicked the aerodynamics of the structure, in order to test the effects of prevailing winds on the cauldron flame.

The modelling data formed the basis of a combustion system design that produced a highly visible flame that was reliable and safe in a range of environmental conditions.

FCT’s engineering team ran pilot scale tests and technical evaluations to ensure that the design met the requirements of SOCOG. The design allowed for multiple redundancies to cover all contingencies. The cauldron operated perfectly during the opening ceremony and throughout the Games, with the FCT Flames team in support.

The 2004 Athens Olympics

The ‘Olympic Rings of Fire’ was an iconic moment from the Athens 2004 Olympic Games opening ceremony. It was viewed live by 4.5 billion people, more than any previous Olympic Games ceremony. FCT was presented with the artistic concept of the ‘Olympic Rings of Fire’ and requested to deliver a design that would bring it to life.

The concept of using fire to create the Olympic Rings symbol in the middle of an immense body of water, which would then be drained for use during the Olympic competition, posed a unique set of problems.

According to Mark Ryan, FCT’s General Manager Business Development, creating these Olympic Rings was no mean feat, “Working with some of the best creative minds in the world is very challenging. Creatives are always very innovative and they want their designs to beat the previous Olympic Games.”

“In Athens, we had flames bubbling out of water in a stadium filled with water. How do you empty that? How do you get the flames to evolve out of the water? It was quite an incredible feat. It was a massive project. In many ways, it was the making of the company,” said Ryan.

FCT’s engineering team devised and tested several original and ingenious burner designs, and developed unique technology to produce the final effect. Safety was a key consideration as approximately 50MW of natural gas was released in a short period of time when the Rings of Fire effect was fully ignited.

Furthermore, considerable amounts of ignition and control equipment had to operate flawlessly while fully submerged in water for extended periods of time. A key aspect of ensuring complete reliability was recognising the importance of the flame ignition systems. All of the ignition systems were specifically developed or adapted for the Rings of Fire. The control system design considered many contingencies to eliminate possible failures.

FCT supervised the installation of the equipment on site in Athens and performed all commissioning of the effect. The Rings of Fire worked on the first attempted firing during the official commissioning of the project and performed perfectly on the night of the Opening Ceremony.

FCT was also awarded the contract to engineer and manufacture 15,000 Olympic torches for the Athens 2004 Olympic Games Torch Relay. This was the first ever truly global torch relay, which visited every city that had previously hosted an Olympic Games, as well as many other significant cities around the world.

FCT worked with its partners to manufacture a torch that was true to the Organising Committee’s artistic design. The shape and
boxes by the competing athletes. So the cauldron was designed with quite a small flame in comparison to other recent Olympic events,” said Retallack.

“The smaller flame was then amplified by placing a moving sculpture behind it. The sculpture reflected the flame, making it look much bigger. Our challenge was to create a flame the size and colour that the artistic director was looking for.”

FCT’s research and development expertise and patented burner technology, together with its unique experience and the knowledge gained on the Sydney 2000 Torch Relay, was invaluable in the production of an Athens Relay Torch that functioned perfectly with minimal adjustment to the original artistic design. The final torch, including fuel canister, weighed only 700gms.

**The 2015 First European Games**

FCT ranks the ‘Burning Man’ created for the opening ceremony of the European Games in Baku in 2015 as its most challenging project yet.

FCT supplied more than 600m of custom designed burner to depict the ‘Burning Man’ flame effect, which was one of the highlights of the Opening Ceremony. The project required extensive research and development to design a burner that would be ‘invisible’ on the stage prior to operation, yet would produce the required flame height and visibility, while lighting reliably in a prescribed sequence—the fire had to start from the heart, and spread out along the man’s arteries.

“We had to make sure that the flame height looked right and the colour was good. We also had to make sure we didn’t set the timber stage on fire,” said Mr Retallack.

More than 250 individual burners, distributed on a stage 60m long and 30m wide were controlled individually from a PLC installed under-stage, together with the natural gas valve trains, gas manifolds, sub-manifolds and individual ignition systems. This effect was installed over a six week period, was rehearsed many times, and worked perfectly on the night.

**The 2016 Rio Summer Olympics**

Most recently, FCT was involved in the cauldron design for the 2016 Rio Summer Olympics.

“Rio wanted to be seen as a green Olympics. There were elements of this in opening ceremony, with seeds carried in and planted in planter boxes by the competing athletes. So the cauldron was designed with quite a small flame in comparison to other recent Olympic events,” said Retallack.

“The smaller flame was then amplified by placing a moving sculpture behind it. The sculpture reflected the flame, making it look much bigger. Our challenge was to create a flame the size and colour that the artistic director was looking for.”

The metal sculpture was made up of hundreds of reflective spheres and plates organised concentrically around the cauldron and supported by a metal ring. Each piece was designed to rotate independently around the ring, creating a pulsating movement and millions of reflections from the cauldron’s flame. The sculpture weighed 1,815kg and measured over 12.2m in diameter.

““The welded structures we produce need to withstand significant temperatures, hence we often use stainless steel to handle both temperature and corrosion,” said Retallack.
"We are ISO90001 accredited and use fabrication workshops that are as well. We always require welding plans, weld quality testing plans, and welders certificates. We take our welded products seriously. They are vital to the way we deliver our projects, as well as to our reputation. We can’t have a weld fail, when it’s two minutes to the opening of the Olympics – weld quality has to be the best," said Retallack.

The Future Burns Bright

With 90% of its work coming from overseas in an exporting capacity, FCT Flames is continuing to diversify its offering, as well as promote its capabilities to new markets and industry sectors.

"FCT has always been known to the Olympic Games and the elite games ceremonial teams, and we were generally contacted when needed. Moving forward, we will now target and market to specific regions in the world where a significant opportunity may exist for flame work," Mr Retallack said

And as far as running the highly innovative and dynamic business out of South Australia?

"The world is much closer these days with relatively fast international travel. The Games business, which has been the mainstay of our company, jumps from country to country so I think it wouldn’t matter where we were based in the world as we would still have to follow the Games programs and then target other markets perceived to be growth flames markets."

Welding in FCT Flames Projects

"While FCT engineers burner system, gas valve trains, supporting structures, and pipework in-house, the welding, non-destructive testing and pressure testing is all sub-contracted to local fabrication shops," said Retallack.

"We’re dealing with high-pressure gas, so the pipework associated with our projects undergoes extensive pressure testing, as do all welds, particularly those on flanges to pipes. All critical welds are subjected to non-destructive testing, using die-pen testing for quality control. In addition, when it comes to the gas pipework, all sections are pressure tested prior to assembly. We regularly prefer to use certified welders for our work."

"All our cauldrons are all stainless steel, from piping and frames, right through to sheetings. This means our sub-contractors are welding stainless steel sheeting together, including gauges of varying thickness. Distortion and exterior finish is critical—distortion levels must be kept low at all times."

"For instance, for the 2016 Rio Olympic Games, the cauldron featured a 1.2m diameter fibreglass sphere. Testing showed that flames would damage the sphere, so we designed stainless steel cladding to protect the sphere. This cladding was completely on show to the public—it was highly visible. As such, it was very important that the stainless steel was welded, grinded and passivated so that all welds were invisible. The cauldron also featured high-end decorative finishes in stainless steel, requiring specialist welding techniques in finishing."

"Similarly, at the 2015 First European Games in Baku, we created the ‘Eclipse of the Sun’, which was effectively a thin stainless steel disc with a raging flame around the circumference. Obviously, factors such as distortion and expansion had to be considered. It is very easy to weld something sitting at ambient conditions. But when the material is heated up, it is a different story. Materials cannot start distorting or welds start popping in the middle of an international spectacle."

"We’re currently engaged on a project which required the welding of a 4m stainless steel collar to the top of a decorative u-shaped surface, almost like a flying saucer. This was being assembled in Turkmenistan, so it was manufactured in four parts to enable shipping. Assembly once on-site required very long welds in very thin stainless steel, which mean that, again, distortion had to be considered. With the proper, careful welding technique, we were able to minimise distortion at assembly," said Retallack."
In 2012, responding to the Department of Defence’s Global Supply Chain initiative, BAE Systems created the Global Access Program. This program is committed to ensuring that Australian companies have access to worldwide business opportunities.

The program provides local suppliers an entry point into BAE System’s global supply chain.

BAE Systems searches across its international supply chains and the supply chains of its partners to find opportunities for Australian businesses to compete to provide products and services to a diverse range of systems and equipment in the air, land, sea and electronic domains.

In addition to providing access to business opportunities, the Global Access Program team offers advice and practical assistance to support SMEs to present themselves as attractive suppliers and help them meet key decision makers in other parts of BAE Systems.

Ian Smith, Head of BAE Systems Global Access Program said, “The Global Access Program provides an open door to companies looking to export their specialist products and services.”

“Connecting suppliers with defence companies that are looking for that niche capability that will improve their competitive position is just the first step on the road to success,” said Smith.

**Domestic Supply Chains**

The Australian defence market is made up of a broad industry base dominated by global defence companies known as ‘prime’ contractors and their extensive supply chains.

There are opportunities for Australian businesses to supply a prime contractor, or one of their sub-contractors, within the Australian market. There are many tiers in a domestic supply chain, creating a network of sub-contractors and their associated supply chains.

The potential for Australian companies to enter a domestic supply chain may be impacted by a number of factors which can include: • Capability • Value proposition • Global competitiveness • Preference for Original Equipment Manufacturer (OEM) components • Risk profile (history of supply, capacity to deliver).

**Working with Defence**

Working with defence can be complex and the defence market can be difficult and costly to enter. To work with Defence, companies often need:

- An appropriate quality assurance program (such as ISO9001 certification)
- A history of supply performance (on schedule, on budget and to specifications)
- A broad customer base which demonstrates supply capacity
- A broad supplier base to ensure supply continuity
- Ownership of Intellectual Property or authorised re-seller rights with authority to offer Original Equipment Manufacturers warranty
- Compliance with necessary security requirements
- Compliance with relevant legislation and codes of conduct.

**Working with BAE Systems**

BAE Systems Approved Suppliers are those who have been assessed under our supplier evaluation and approval process, after successfully bidding and winning business with us. Once a Supplier is added to BAE System’s Approved Suppliers List, they participate in biennial reviews to ensure performance is acceptable and the contract is still valid.

For more information, visit www.baesystems.com or contact our team at au.globalaccessprogram@baesystems.com.

**Sources:**

www.business.gov.au
www.airforce.gov.au
Case Study: F-35A Lightning II

F-35 is the world’s largest defence program. Led by the US, with participation from the UK, Italy, Netherlands, Australia, Canada, Denmark, Norway and Turkey, it is a truly collaborative program aimed at delivering a stealthy, multi-role attack aircraft capable of operating from land and sea.

The F-35A Lightning II will provide for Australia’s future air combat and strike needs. Australia has committed to 72 F-35A aircraft for three operational squadrons at RAAF Base Williamtown and RAAF Base Tindal, and a training squadron at RAAF Base Williamtown. In the future, a fourth operational squadron will be considered for RAAF Base Amberley, for a total of 100 F-35As.

The first F-35A aircraft is scheduled to be accepted into Australian service in 2018 and the first squadron, Number 3 Squadron, will be operational in 2021. All 72 aircraft are expected to be fully operational by 2023.

The F-35A will provide Australia with a fifth generation aircraft at the forefront of air combat technology, to provide a networked force-multiplier effect in terms of situational awareness and combat effectiveness. Capable of supersonic flight whilst retaining stealth, the F-35A has extraordinary acceleration, agility and 9G maneuverability. The F-35A is the most suitable aircraft to replace the aging F/A-18A/B Hornets.

The F-35A is characterised by a low profile design; internal weapons and fuel carriage; advanced radar; electro-optical and infrared sensors with advanced voice and data link communications; and the ability to employ a wide range of air-to-surface and air-to-air weapons.

BAE Systems Australia produces advanced manufactured titanium components for the vertical tails of the F-35A Lightning II (Joint Strike Fighter).

Through BAE’s Global Access Program, the F-35 program is presenting major opportunities for Australian industry, helping South Australia to transition out of automotive manufacturing and create high technology jobs in other sectors.

Adelaide company Axiom is a key part of the BAE Systems supply chain for F-35 vertical tail work.

F-35 opportunities have resulted in Axiom transforming from a mostly automotive component supplier to a high-end precision machining and manufacturing company.

According to Ian Smith, “As well as securing a manufacturing contract with BAE Systems, Axiom has put in the hard yards to gain certification standards that are recognised across the global defence market.”

“Axiom is now well positioned to secure more work with BAE Systems in the US,” said Smith.

About BAE Systems

BAE Systems provides some of the world’s most advanced, technology-led defence, aerospace and security solutions and employ a skilled workforce of some 82,500 people in over 40 countries. Working with customers and local partners, BAE Systems develops, engineers, manufactures and supports products and systems that deliver military capability, protect national security and people, and keep critical information and infrastructure secure.
The Advanced Manufacturing Growth Centre (AMGC) has released its first Sector Competitiveness Plan detailing how the Australian manufacturing sector along with its supported industries can add up to $36 billion to the national economy over the next ten years. The AMGC’s Sector Competitiveness Plan (SCP) provides extensive new analysis of Australia’s manufacturing landscape and where opportunities lie to boost companies’ global competitiveness.

It includes specific actions for industry and government, and identifies knowledge priorities that help inform companies and the research community on business improvement and R&D efforts.

Findings from the SCP reveal that the biggest opportunity for Australian manufacturing companies to increase their competitiveness is to compete on value, not on cost. When Australian manufacturing firms succeed in global markets it is usually not because they are the lowest cost, but rather because they offer innovative products or value-adding services.

A greater composition of high-skill manufacturing workers is required to meet market expectations of high value products and services.

Supporting this analysis, the SCP demonstrates that by employing more high-skill labour delivers Australia a wage cost advantage over most developed manufacturing nations. The AMGC’s research shows that in the medical devices and aerospace industries, management and professional wages are between 38% and 40% lower in Australia than in the United States.

Dr Jens Goennemann, AMGC’s Managing Director, points out that, “We need to take note that manufacturing includes the full spectrum of making things starting from the ideas stage all the way through to the final good or service. Hiring more highly skilled labour will help us to innovate faster and to offer the technical and service edge global customers demand.”

“The days of competing solely on cost are long gone. We cannot compete against low-cost production nations and expect a sustainable manufacturing industry.”

Additional competitive advantages lie in Australia’s potential to collaborate. The SCP shows that Australia has a market dominated by small companies relative to the United States particularly in the two sub-sectors the Centre investigated. To overcome economies of scale challenges, the AMGC stresses the importance of manufacturing companies and research institutions to forge partnerships amongst each other and with commercial outcomes in mind.

A key recommendation for the government outlined in the SCP, is to change the way manufacturing is measured in the economy, and to recognise that manufacturing triggers additional jobs in associated industries that rely on manufacturing. New metrics are needed to measure the impact of indirect employment beyond manufacturing.

Other specific actions for governments include smarter procurement programs to aid in technology capability transfer within and between industries, and to better direct current R&D tax incentive programs to support higher-risk and longer-term R&D investments.

The AMGC insists that while lifting Australia’s manufacturing competitiveness requires a synchronised effort from all stakeholders, it is manufacturing companies that must lead the charge.

“"The SCP is the catalyst to change the conversation about Australian manufacturing. It sets AMGC’s direction for the course of Australian manufacturing and reveals how to translate insights from our SCP into action. We will do this by working closely with our stakeholders, and investing in growth projects and collaboration hubs that will connect more Australian manufacturers with each other, with researchers and into global supply chains,” said Goennemann.

Dr Alan Finkel, Australia’s Chief Scientist has supported the AMGC’s efforts by adding, ‘The Advanced Manufacturing Growth Centre’s Sector Competitiveness Plan is an insightful report that will help boost capability, whilst developing global opportunities for Australia’s manufacturing industry.’

To download a copy of the 2017 Sector Competitiveness Plan, please visit www.amgc.org.au.
**About the Advanced Manufacturing Growth Centre**

The AMGC is a membership-based, not-for-profit organisation which supports the development of a world-leading advanced manufacturing sector in Australia. Connected by a nationwide network of research and development hubs, AMGC’s role is to unlock new commercial opportunities and drive innovation in Australian manufacturing by fostering collaboration between industry enterprises and the scientific and research community.

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**Quickstep Secures AMGC Grant**

Manufacturer of advanced carbon fibre composites, Quickstep recently secured an AMGC grant of $250,000 for a project to develop a ‘Low cost carbon composite fender for the European automotive market’, with the potential to generate export revenue of $25 million.

Carbon fibre composites provide significant reduction in weight, improved mechanical performance, and excellent corrosion resistance. However, the high production cost has been the main obstacle limiting the adoption rate of composite materials in the automotive industry. This is particularly the case for geometrically complex parts such as fenders. Currently, carbon fibre fenders are produced using a labour-intensive process where the layup is carried out manually due to the complexity of the design. In addition, the long cure cycle required to cure parts inside the autoclave contributes to the high cost of these parts. Phase one of the AMGC project will run for a period of six months in cooperation with Deakin University’s Carbon Nexus Research Centre.

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**About the Australian Manufacturing Industry**

The Australian manufacturing industry contributed $101.7 billion gross value added in 2015-2016, approximately 6% of Australia’s Gross Domestic Product (GDP). This makes manufacturing one of the highest revenue generating sectors in the Australian economy.

In addition, manufacturing is growing. It now employs over 902,000 people across the country representing 7.6% of the Australian workforce. There are approximately 83,000 manufacturing businesses in Australia, and 19,000 advanced manufacturing businesses. According to Deloitte’s Global Manufacturing Competitiveness Index 2016 Australia ranks 21st.

The recovery in employment coupled with strong revenue indicates a positive sentiment toward investing in Australian manufacturing. This is further evidenced by increases in the Australian Industry Group Australian Performance of Manufacturing Index (Australian PMI®). In February 2017, the PMI rose by 8.1 points to 59.3, recording a fifth consecutive month of expansion and its strongest result since May 2002.
State Focus: Northern Territory

In late 2016, Chief Minister of the Northern Territory, Michael Gunner, announced a $5 million package aimed at providing work for the Territory’s struggling steel industry. This $5 million boost to the steel industry is part of the Northern Territory Government’s $22 million Immediate Works Stimulus Package, which is designed to drive smaller infrastructure projects across the Territory (in turn supporting smaller tradesmen) until several bigger projects kick off during the second half of 2017.

Industry Capability Network Gateway

Any tradesmen in the Northern Territory interested in tendering for Government projects should register via the Industry Capability Network (ICN) Gateway. We identify, develop and match opportunities to Northern Territory, Australian and New Zealand businesses. We help those wanting to buy goods services and equipment to find competitive local suppliers. Linking to a national database and other ICN offices through Australia and New Zealand we give Northern Territory businesses access to opportunities in industry, government and major projects. For further details, please visit: www.icn.org.au/nt_home
Chief Minister of the Northern Territory, Michael Gunner said, “I am releasing $5 million of works to take effect from February [2017]. This is part of the Territory Labor Government’s plan to get money flowing in the community and to create certainty and confidence for business.”

“ Territory steel fabricators and manufacturers are going through a tough time. This has been the case for more than 12 months. Previously, despite their pleas, no specific plan was put into place to support this industry. That has now changed.”

The recent announcement forms an integral part of the NT Government’s $22 million Immediate Works Stimulus Package to support local jobs as part of an infrastructure plan.

It comes off the back of the 37 new and fast-tracked infrastructure projects worth $120 million announced in November 2016. The $22 million Immediate Works Stimulus Package is designed to drive smaller infrastructure projects across the Territory – which in turn supports smaller tradesmen – until larger projects commence in the second half of 2017.

It includes $10 million to be available to all Territory community and not-for-profit groups to upgrade facilities and undertake repairs, plus $5 million for repairs and maintenance to urban public housing stock.

The $5 million for the local steel industry will be spent on:

- Bringing forward more bus shelters: $1.2 million
- Crocodile traps: $300,000
- Shade Structures for parks across the Territory: $1.2 million
- Shade structures for sport and recreation: $1.25 million
- Shade shelters for the Larapinta Trail: $400,000
- Picnic Tables for parks: $300,000
- Park BBQs: $60,000
- Bike Racks: $20,000
- Equipment shelter: $200,000
- Bollards: $8,000
- Fabricated fencing (not off the shelf): $100,000

“ These works are steel focused and will provide work for the steel industry,” Mr Gunner said.

“ To ensure that local companies get the best possible opportunity to get this work, the Government will release the work in smaller packages. This will also mean more businesses should get some of the work rather than concentrating on a few.”

“We will require all tenders where the supply, fabrication or galvanising of steel is specified, to include a price for these components from local Northern Territory businesses.”

Treasurer Nicole Manison said the $22 million in Immediate Works is designed to keep work flowing until the recently announced $120 million in new and ‘fast-tracked’ projects kicks in across the Territory in the middle of 2017.

“The $22 million package includes four targeted programs and will support smaller infrastructure projects across the Territory, which in turn supports the smaller tradies, until the bigger projects ramp up in the second half of 2017,” Ms Manison said.

“Our stimulus package will support tradies and provide community assets — there will be something for all Territorians to see and benefit from. The first program is a package of $10 million available to all Territory community and not-for-profit groups, for grants up to the value of $100,000 for much-needed repairs and upgrades to facilities and existing assets.

“Beyond the $100,000 grant, the Northern Territory Government will match ‘dollar-for-dollar’ up to another $100,000 to help fund even bigger improvements. All Territory community and not-for-profit groups, including sport and recreation, arts and multicultural groups are encouraged to apply for the $10 million available funding.”

NT Master Builders said there is a compelling reason for Government to act with an immediate stimulus package. “Committing to projects is a sure-fire way to get money circulating quickly through the economy and the linkages our industry has with other industries will see that money flow quickly through those as well,” NT Master Builders CEO David Malone said.

“We all know that it is not Government’s job to put food on the table of business in the Territory, but having said that, it is Government’s job to manage the economy. As an emerging regional economy, the impacts of slowdowns like we are witnessing are different to major urban communities. People tend to leave when opportunities disappear, so we lose people, skills, demand and capacity with each of those decisions.”

The Immediate $22 million Immediate Works Stimulus Package breakdown is:

- $10 million for upgrades to community groups facilities
- $5 million will go towards public housing repairs
- $5 million for steel fabricators
- $2 million for repairs to remote health clinics

Source:
www.ntnews.com.au
The Anti-Dumping Commission Explained

By Dale Seymour, Commissioner of the Anti-Dumping Commission

Last year, an Anti-Dumping Commission report found significant distortions to global steel and aluminium markets caused by widespread government interventions and trade restrictions. The nature and extent of these interventions has been a major cause of continuing global overcapacity, excess production and depressed world prices for steel and aluminium.

These distortions often result in unfair trading behaviours, like dumping and subsidisation. Unfair trading behaviours in global steel markets can lead to distortions in the markets for steel fabricated products.

Recently, the Commission started a study of how the prevailing conditions in global steel markets are affecting the growth and profitability of steel fabrication markets in Australia. The study will also improve our understanding of how Australian steel fabricators are affected by dumping and subsidisation.

The primary steel and steel fabrication industries are an important part of the Australian economy. While Australia is a comparatively small producer of steel and steel products compared to other countries, Australian businesses are important suppliers of steel products for domestic use. The demand for steel and steel fabricated products is largely driven by the construction, heavy engineering and manufacturing industries.

For Australian businesses to continue to grow and succeed, it is vital they have access to open markets and trading opportunities. Free trade opens up opportunities for Australia. It gives consumers and businesses a greater choice of products, increases competition and provides access to new technologies. But trade has to be fair, otherwise Australians won’t see the full benefits.

Australia’s anti-dumping and countervailing (anti-subsidy) system plays an integral role in helping businesses, including those in the steel fabrication industry, compete on a level playing field with imported products. Dumping occurs when exporters in overseas markets sell products in Australia at less than the price they would sell them at home.

Subsidisation occurs when imported goods benefit from government assistance in the country of export. Behaviour like this can hurt Australian businesses. As the Anti-Dumping Commissioner, I am responsible for administering the anti-dumping and countervailing system.

“I am committed to a strong and robust system. It is recognised globally as a progressive and transparent regime that is evidence based, independent and fair to all parties.”

The Commission undertakes factual, evidence-based investigations into whether dumped or subsidised imports are harming (‘injuring’) Australian businesses. I make recommendations to the Government on whether duties should be imposed on goods that are dumped or subsidised.

The Government will only impose duties on imported goods where there is evidence that dumping or subsidisation is occurring and that this is causing material injury to Australian businesses.

The system is open and transparent; all key documents are published on the Commission’s website. Affected
parties have the opportunity to present evidence and arguments and participate in the Commission’s processes.

Most of the Commission’s current workload is focused on steel products. In fact, the Commission has undertaken a record number of investigations into dumping and subsidisation of steel imports in recent years.

Globally, there are concerns about excess production in global steel markets. The OECD has highlighted that excess capacity in one region can displace production in other regions, harming producers in those markets, including through unfair trading practices like dumping. The G20 countries have encouraged steel producing countries to work together to address the causes of the overcapacity, including inefficient government interventions in markets.

The Commission’s August 2016 report on global steel and aluminium markets reached similar conclusions on the negative effects of market interventions and trade restrictions which distort the market behaviours and commercial decisions of steel producers in global markets.

Our market analysis of the steel fabrication industry follows on from our report on primary steel markets.

It will inform me and the Australian community about:
- The economic significance and diversity of the steel fabrication industry
- How developments in global steel markets and trading behaviours like dumping and subsidisation are affecting the growth and profitability of the industry, and
- Experiences of Australian steel fabrication businesses with the anti-dumping and countervailing system, including their ability to access the system and how they are affected by anti-dumping measures.

The Anti-Dumping Commission: A Snapshot

- Free trade opens up opportunities for Australia. But Australians only get the full benefits from these opportunities when trade is fair.
- Australia’s anti-dumping system helps to ensure that Australian businesses, including steel fabricating businesses, can compete on a level playing field with imported products.
- The Anti-Dumping Commission undertakes factual, evidence-based investigations into whether dumped or subsidised imports are causing injury to Australian businesses.
- Australia’s system is recognised globally as evidence based, independent, transparent and fair to all parties.
- The Commission is currently studying how the steel fabrication industry is being impacted by events in global steel markets, including dumping and overseas subsidisation of steel and steel fabricated products.
The Commission is actively engaging with steel fabrication businesses and industry associations to ensure the findings from the study are based on a good understanding of the industry and the issues for steel fabrication businesses. I very much appreciate the willingness of people within the industry to assist the Commission in this way.

Australian businesses will only succeed when they are competitive. The anti-dumping and countervailing system does not shield businesses from vigorous competition. It is an effective, robust and evidence based system that supports genuine free and fair trade.

Help for Small and Medium Enterprises

The Australian Government provides advice and assistance through the International Trade Remedies Advisory Service (ITRA Service) to help Australian small and medium-sized enterprises (SMEs) access Australia’s anti-dumping system.

The ITRA Service can be accessed by all eligible Australian SMEs impacted by the anti-dumping system, including producers and manufacturers who may be being injured by dumped and subsidised imports, as well as importers and end users who may be affected by anti-dumping measures.

The ITRA Service helps SMEs by:
• Raising awareness of how the anti-dumping system works
• Giving advice on anti-dumping and countervailing matters, including options for businesses to participate in the anti-dumping system
• Assisting with preparing applications for investigations and all other case types (e.g. reviews, duty assessments and exemptions)
• Assisting with making submissions to the Commission
• Facilitating cooperation between SMEs to ensure applications have the required level of support.

Email itra@industry.gov.au or phone (02) 6213 7267 for more information.

Dale Seymour, Commissioner of the Anti-Dumping Commission

Mr Seymour commenced as Commissioner in 2013, and is an independent statutory office holder under the Customs Act 1901. He has worked as a senior executive in both the public and private sectors. Prior to his appointment as Commissioner, he was a Director of Deloitte Access Economics and President of Wormser Energy (USA). Mr Seymour has held a range of senior executive roles in the public sector including as Deputy Secretary of the Victorian Departments of Primary Industries, Natural Resources and Environment and State and Regional Development. He was also the Chief Commission Officer (statutory) of the Employee Relations Commission of Victoria (ERCV). As Australia’s Anti-Dumping Commissioner, Mr Seymour is responsible for leading and directing the work program for the Anti-Dumping Commission, and exercising the powers of the Commissioner under the Act.
The Global Market for Steel and Aluminium

Steel and aluminium markets have undergone substantial change over the past decade. In the lead up to the Global Financial Crisis (GFC), demand for steel and aluminium products reached unprecedented levels, supported by rapid investment in new infrastructure in China.

The resulting high prices and margins for steel and aluminium products prompted large investments in increasing production capacity in steelmaking and both aluminium smelting and extrusions.

In some countries, government market interventions added to commercial investment incentives and led to substantial capacity increases, including projects that are still in the pipeline.

As a result of the GFC, a subsequent slowdown in global economic activity and an acceleration of China's economic transition (from investment-led growth to being more consumption-based), demand for steel and aluminium products has slowed significantly.

While global steel and aluminium production has also fallen, the slowdown has been less than for demand, resulting in excess production, lower prices and large stockpiles. Aluminium demand has recently shown signs of recovery.

Excess capacity—a problem that afflicts the steel industry during every downturn in the business cycle—is also a significant issue for the sector.

The growing gap between global steelmaking capacity and demand has led to deterioration in the financial situation of steelmakers, and raised concerns about the longer-term economic viability and efficiency of the industry.

Despite this, new investment projects continue in many parts of the world. Australia’s experience has been similar to the rest of the world. High demand from the Australian construction and heavy manufacturing sectors resulted in demand for steel and aluminium in the lead up to the GFC, but this growth has slowed considerably.

The Australian industries are facing considerable competition from overseas markets. Australian producers are generally higher cost by global standards. The new global capacity that has recently been developed uses progressively more efficient production processes, and the cost of producing steel has decreased in real terms over the last decade.

Market-distorting Government Interventions and Trading Practices in Steel and Aluminium Markets

Global steel and aluminium industries commonly experience economic cycles and over-shooting of production capacity as a result of general business cycles. However, the Commission’s analysis supports a finding that economically inefficient market interventions have amplified, and are likely to have extended the duration of, the current cyclical downturn.

Analysis from the Organisation for Economic Co-operation and Development (OECD) has found that a major factor contributing to capacity imbalances in the steel industry, in addition to market downturns, are inefficient government interventions and other market-distorting practices.

Government interventions in aluminium and steel manufacturing industries have occurred, to varying degrees, at various times in many countries, including Australia.

Reasons for these interventions often include encouraging investment, self-sufficiency and local employment opportunities.

More recently, interventions have increasingly been directed at pursuing environmental objectives and structural adjustment policies.

Asian governments are not unusual in intervening in steel and aluminium markets. However, the nature and extent of previous and, in some cases, continuing Asian government interventions, and the relative magnitude of Chinese production, has meant that these interventions have been major contributing factors—although not the only contributors—to sustained global overcapacity, ongoing excess production, the build-up of large stockpiles (especially of aluminium), and depressed world prices.

Many of the policies adopted by Asian governments, particularly in China, would meet the OECD’s definition of being market distorting in that they have the effect of sustaining ongoing overcapacity by supporting the building of new capacity or keeping inefficient facilities in operation.

Bringing global capacity into balance with demand is unlikely to occur in the near-term, in part because government interventions continue to support new capacity investments and delay the closure of inefficient plants.

The OECD considers that the outlook for the steel industry has weakened significantly and that adjustment pressures are growing. It has cautioned that government interventions that lead to more market distortions would eventually create even more severe adjustment challenges in the longer term.

Source
Analysis of Steel and Aluminium Markets Report to the Commissioner of the Anti-Dumping Commission, August 2016.
Advanced Subsea Pipeline Protection

Monitoring the impact of corrosion on subsea pipelines and offshore structures is a critical aspect of ensuring pipeline integrity. A key way of minimising corrosion is to employ the most appropriate technologies and prevention techniques. Owners of high-value infrastructure assets such as pipelines and production platforms must understand the cost implications of ignoring the effects of corrosion. There are many advantages of planning for corrosion control and mitigation, including extending the life of the asset while reducing maintenance time and costs.

Pipeline infrastructure is also aging and with the price of oil remaining low, corrosion prevention has to be as cost effective as practical. Companies servicing the oil and gas industry are being challenged to find better ways to maintain the integrity of subsea structures. Some of the factors that need to be considered include how long the system has to remain in operation and would a shorter life extension be acceptable if the asset owner is willing to repeat the process more frequently.

Two leading companies that are developing and implementing a range of innovative technologies and processes that support pipeline operations are Deepwater Australasia (DWA) and Corrosion Control Engineering (CCE).

According to David Flanery, Business Development Manager at DWA, the method of corrosion protection selected for offshore infrastructure depends on the construction material used. Pipelines are often epoxy or concrete encased whereas a platform usually has large amounts of exposed steel. Subsea assets often require protective systems that include special coatings with a long design life in conjunction with cathodic protection systems.

John Grapiglia, CCE’s Western Australian Manager, added another change that has occurred is that the ‘design life’ of a pipeline is now expected to be significantly longer in duration. “Historically, pipelines were designed for 20 to 25 years, following which time they underwent a ‘life extension’,” he said. “These days the design life is set at 50 years for some projects.”

Around the world, there are thousands of kilometres of pipelines—on and offshore—connecting drilling rigs and production platforms to wellheads and other facilities. This infrastructure represents billions of dollars of investment by companies over many years. Corrosive fluids flow inside the pipelines and on the outside they are exposed to a range of harsh physical, climatic and chemical effects that can cause corrosion and degradation.

Deep ocean, coastal and onshore environments present very different operating conditions for infrastructure. In tropical regions, surface water might be as warm as 20°C and at one atmosphere of pressure, compared to the deep ocean where the temperature at depths of thousands of metres drops to around 2°C and the pressure increases to more than 1700 psi. (At sea level, the atmospheric pressure is approximately 14 psi.)

Oil from deep wells can be as hot as 176°C. As the hot oil comes up from the well it travels through the much colder pipeline and the fluid in the pipe can quickly cool down. At approximately 21°C, the water and gas mixtures in the pipe can form gas hydrates or paraffins. If the build-up of paraffins is too great, it can ultimately block the pipeline. Such blockages can be extremely costly to clear and, if a pipeline ruptures, can cause catastrophic damage to equipment and the environment. In order to prevent catastrophic failures, there is ongoing research into new insulation materials and their application procedures. “Unfortunately, some of these new materials have not been in use for very long and thus their long term performance is unpredictable,” Grapiglia stated.

Maintenance and corrosion prevention come together to ensure Subsea Flow Assurance. These are the processes that ensure subsea pipelines and equipment maintain oil flow. “Appropriate insulating materials must be applied to infrastructure in order to maintain or at least slow down the heat loss from the fluids being transported,” Flanery said. Manufacturers of surface coatings have worked to develop suitable materials to handle the extreme conditions of deep water activities.

One corrosion control method used on pipelines is cathodic protection (CP). This is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected to a more easily corroded “sacrificial metal” to act as the anode. The sacrificial metal then corrodes instead of the protected metal.
“An offshore production field is a very complex system,” Flanery said. “Ideally, all the different components and their separate corrosion protection needs should be carefully planned at the design stage.”

For example, oil and gas flows from the reservoir, through the subsea tree and, typically, to a manifold or pipeline end termination (PLET) via a jumper pipe. Fluids pass along the pipelines to a production platform for processing before being sent to a tanker or onshore facility for further processing.

“You cannot just look at a pipeline in isolation,” Flanery added. “It is always part of a much larger system.” It is important to ensure there are no design gaps between the corrosion protection systems of two adjacent assets, such as a flowline and a manifold.

Both Flanery and Grapiglia commented that segments of a production system are often designed in isolation, with little or no consideration being given to how they might be integrated. Different contracts cover supply and installation with operation often covered by yet another contract.

The consequence of this disjointed and ad hoc design and installation is that after just a few years of operation, ‘new’ fields are showing signs of early failure of some of the CP systems protecting the equipment. “A lot of companies think that the protection system is fairly straight forward and they can save money by undertaking basic text book designs,” Grapiglia said. “It is better to invest a little extra at the start and avoid massive costs later to replace the whole protection system.”

One area that has been neglected in the past is the interface between onshore and offshore pipelines. Traditionally the offshore pipelines are designed to one standard and the onshore to a different one. The “shore crossing” has been a ‘no man’s land’. Research is currently under way in Australia to assess the best way to deal with this section, as well as develop best practices which can be used for future projects.

Another aspect that makes the interface difficult is that the crossing is often through an environmentally sensitive area. For example, on Australia’s North West coast, the shore crossing for one offshore field is on Barrow Island, where there are strictly enforced quarantine restrictions. The requirement to strip down all equipment and vehicles for cleaning prior to them being shipped to the island increases the cost and time taken to service the pipelines there. Additionally once the shore crossing is completed, the installation is to have minimal environmental impact.

This Australian research has generated considerable interest overseas as it has never been properly addressed previously. Major international certification organisations such as Det Norske Veritas (DNV) have looked at adopting the findings of this Australian research to address the current gap in industry.

The most common CP systems for subsea pipelines use sacrificial bracelet anodes that are clamped onto the pipeline approximately every 10 joints, or 120 metres. The anode is bonded to the pipeline via small wires, or bonding straps, fastened to studs welded directly to the pipeline.

Flanery stated that the latest CP systems used to replace those on ageing structures are orders of magnitude improvements on earlier systems. “On an ageing North Sea production platform, there were originally 900 sacrificial anodes for the CP system,” he stated. “We had...
to extend the life of the platform so designed a replacement system that used only eight impressed current anode sleds that were positioned on the sea bed around the platform.” According to Flanery, this design avoided the logistical problems of transporting more than 600 tonnes of replacement anodes by boat to the structure out into the ocean.

How CP systems are powered is a vital consideration for offshore structures. There is little spare space on a production platform so any equipment added to an existing structure must have a minimal footprint. Flanery stated that for the North Sea project, the power and control systems were contained inside a standard shipping container.

“There have been a number of advances that allow significant improvement in the monitoring and control of CP systems particularly when it comes to onshore pipelines,” Grapiglia said. Technology recently introduced into Australia now allows owners and operators of pipelines to easily upgrade old protection systems to allow for control as well as ongoing monitoring without having to replace the entire controllers. Flanery concurred, stating “Cost saving is one of the biggest drivers of innovation, especially in the large-scale, challenging projects.”

To ensure that there is no danger of a pipeline rupturing, most countries require regular inspections of any company operating both onshore and offshore fields and they must be able to certify compliance.

One method of monitoring a pipeline’s CP system in the case of offshore pipelines is called Electrode Field Gradient (EFG) measurement where a Remotely Operated Vehicle (ROV) or diver swims along the entire length of a pipeline to record the field gradient of the pipeline’s CP system. Field gradient can be used as an indication of cathodic protection activity. The field gradient strength is a function of the distance between the reference electrode array and the pipeline. However, all pipeline surveys must include periodic ‘stabs’ along its length to recalibrate the EFG readings.

One of the latest methods for surveying pipelines is to install CP test stations at a regular, calculated interval, similar to those for onshore buried pipelines. Monitoring of the test stations requires minimal survey equipment aboard a survey vessel. A ROV or diver is required to take contact readings at these test stations using a special probe. Next, a nearby anode can be located and stabbed. During both contact measurements the voltage gradient is recorded.

Unfortunately, in practice, these surveys are sometimes not conducted correctly leading to inaccurate information that is used to assess the performance of the system. One reason for this is that some companies use staff that have not been adequately trained in CP or they use inspectors that have undertaken very basic training to carry out the assessments.

From these readings, the survey crew can use pipeline CP attenuation modelling to determine the next appropriate survey site and report on what actions may need to be taken immediately or planned to maintain optimal operations.
The WTIA is pleased to announce the launch of the Australian Welder Certification Register (AWCR). The AWCR provides a national framework for qualifying and testing welders to International Standard ISO9606-1. It allows qualified and certified Registered Welders (RW) to work on any site without further testing, resulting in a significant cost saving to industry, and it provides industry with access to a database of welders with up-to-date certification, as well as details of their career history. The AWCR will also generate data for skills gap analysis enabling the development of a detailed suite of training initiatives to upskill the workforce.

Benefits to Employers
- Reduced Costs: Check the competence level of any Registered Welder against an internationally recognised standard, minimising welder testing.
- Minimised Risk: By having a recognised and certified competency level, the risk of a welder failing a weld procedure is significantly reduced.
- 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 an AWCR ‘Champion’ to ensure the register is kept up to date.
- Register suitably qualified staff for Approved Examiners status.
- Use the system to certify against your own weld procedures.

Benefits to Welders
- Improved Employability: Welders will be able to present third-party verified qualifications to prospective employers.
- International Qualification Recognition: Work overseas, with ISO 9606-1 certification recognised in Australia, 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 certification record on the system; failure to do so could lead to certification being suspended or withdrawn. 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 certification confirmation every 6 months, and this information is entered onto the WeldQ system.
- The revalidation process is completed every two years.

The Welder Certification Process
The WTIA has worked hard to make the welder certification process as easy as possible. To begin, a welder registers on the WeldQ system at no charge. They select either an industry specific or a generic weld test program, and then review the welding procedures required for the program.

The welder then registers for the program and pays an application fee. Once paid, a Testing Centre or Approved Examiner contacts the welder to arrange a weld test.

Once qualified, the test results are entered onto the WeldQ system by the examiner. The WeldQ system generates an online certificate covering details of process. Certification is valid for up to two years, subject to six monthly confirmations by a responsible person.
Meet the WTIA Team

The WTIA is managed by a team of experienced industry professionals, all of whom are experts in their field. Our primary goal is to ensure that the Australian welding industry remains locally and globally competitive, both now and into the future. As such, all our team members are dedicated to providing members with the best possible service and outcome. To help you ‘put a face to the name’, you’ll find a brief introduction on each of the WTIA’s team members below. If you have a general inquiry, please feel free to contact the friendly WTIA team on 02 8748 0100 or info@wtia.com.au, or visit our offices in Pymble, Sydney.

Geoff Crittenden, Chief Executive Officer
Geoff is a chartered engineer with over 30 years’ experience and a diverse background that includes CEO and senior leadership roles in the not-for-profit, consulting, engineering and healthcare industries. He has led multi-disciplinary teams in highly technical and complex environments, and has developed and implemented long-term business strategies that have led to strong growth. Geoff started his career as an engineer in the British Army, serving in Northern Ireland, Cyprus and Germany for over 15 years. Following the fall of the Soviet Union, Geoff decided upon a career change and, with his family, immigrated to Australia. Geoff's first role in Australia was CEO of the Association of Consulting Engineers, after which he held senior leadership positions with Transfield Worley, Cynergy Group, Tianda Pharma and the Risk Management Institute. In conjunction with the Board, Geoff is responsible for the continued success of the WTIA. He is accountable for delivering on the WTIA's Mission, serving its members, and overseeing all day-to-day operations of the WTIA.

Bruce Ham
Chief Technology Officer
Bruce joined the WTIA in 2014, and manages the delivery of all WTIA services. Bruce began his career at the State Electricity Commission of Victoria, and has experience in Plant assessment; Fitness for Service; Run, Repair, Replace decision making and execution; Visual and Non Destructive Inspection; and welding technology in many industries including power, alumina, and mining, oil and gas.

Alistair Forbes
Technology Operations Manager
Prior to joining the WTIA, Alistair was a Product Manager at BOC, responsible for the management of the welding consumables and industrial chemicals product portfolio. Alistair was previously employed at the WTIA, managing our technical panels. With over 30 years experience, Alistair brings a wealth of knowledge to his role at the WTIA.

Donna South
Membership Manager
Donna heads up the WTIA's Member services, ensuring that the WTIA is promoting the interests of its members. She has worked in a variety of industries and roles intersecting with the industrial sectors that make up the WTIA's member base. Before joining the WTIA, Donna worked in recruitment for the construction, civil, mining and engineering industries, as well as at Ausco Modular.
Annette Dickerson, Qualification and Certification Manager

Annette joined the WTIA in 2009, bringing over 20 years’ experience in engineering-related industries including manufacturing, ship building, rail, aviation and aerospace sectors. Annette manages delivery of qualification and certification programs including those for welders, supervisors, technologists, engineers and inspectors, as well as the AWCR.

Rebecca Hansen
Membership Coordinator

Rebecca joined the WTIA in 2016 with a wealth of experience in member services within the not-for-profit sector. Rebecca previously worked at APRA AMCOS (a music industry membership association) for over 20 years, where she was the first point of contact for members, and undertook event planning, research and licensing.

Edwina Mills
Office Administrator

Edwina joined the WTIA in 2016 as the joint Member Services and Office Administration with the Australian Steel Institute. After six months as part of the team, Edwina is now working as our Office Administrator. Edwina’s extensive administration experience, gained at The University of Sydney and Johnson & Johnson Research is a great asset to the WTIA.

Anna Zervas
Accounts Assistant

One of our longest serving employees, Anna joined the WTIA in 1995. As a result, Anna has an exceptionally thorough knowledge of the WTIA’s processes and policies. As our Accounts Assistant, Anna provides support for the operational needs of the business and takes great pride in assisting with member, client and staff inquiries. Anna holds a Certificate in Commerce.

Paolo Corronca
Technology Manager

Paolo is a mechanical engineer with over ten years’ experience in EPC and EPCM projects (valued up to US$20 million), particularly in the oil and gas industry. Paolo joined the WTIA in mid-2014 as the SMART Industry Groups Manager and in 2015, Paolo moved into the role of Technology Manager. Before joining the WTIA, Paolo was a Mechanical Engineer at Remosa SpA in Italy.

Sasanka Sinha
Technology Manager

Sasanka joined the WTIA in 1998 and holds IWE, two Masters in Materials Welding and Production Engineering. He is also a Chartered Professional Engineer and Registered Professional Engineer of Queensland. He has extensive experience in fabrication and welding, particularly in the fields of ship building, railway wagons, pressure vessels, construction and mining equipment.

Annette Dickerson, Qualification and Certification Manager

Rebecca Hansen
Membership Coordinator

Edwina Mills
Office Administrator

Anna Zervas
Accounts Assistant

Paolo Corronca
Technology Manager

Sasanka Sinha
Technology Manager
**Bruce Cannon**
**Technical Publications Manager**

With 40 years experience, Bruce joined the WTIA in 2016. Prior to this, he worked at BlueScope Steel in areas such as resistance seam welding, flash butt welding, welding monitoring systems. He also spent many years at BHP in the fields of delayed hydrogen cracking, special testing of steels, weld repair, and welding of coated steels and quenched and tempered steels.

**Louise Petrick**
**Technology Manager**

Louise has held a range of welding and materials engineering roles over the last 13 years. She is an International Welding Engineer, with a MSc in Metallurgy and a MEng in Welding Engineering. She has worked in power generation, doing research and providing plant support. In 2014, Louise moved to Australia and joined Synergy, before joining WTIA in 2015.

**Anabel Cantero**
**Qualification and Certification Coordinator**

Anabel joined the WTIA in 1990 and since 2000 has been an integral member of the Qualification and Certification team. Anabel is responsible for processing applications, communicating with both applicants and examiners, and organising qualification renewals, and coordinating the IWS, Welding Supervisor and Welding Inspector examinations.

**Kevin Bohne**
**Technology Manager**

Joining the WTIA in 2011, Kevin has experience in the power generation, oil and gas, mining, construction, and pressure vessel industries. He is well-versed in welding procedure specifications, qualification of welders, and welding safety, supervision, inspection, engineering, design, failure investigation and auditing. Kevin holds a Masters of Welding Engineering.

**Paul James**
**Training Manager**

Joining the WTIA in 2016, Paul is an expert training professional, with extensive experience developing learning solutions and strategies in multiple industries. Paul held training and development management roles at various leading Australian organisations, including the Department of Defence, Downer EDI, Thales and the Commonwealth Bank.

**WTIA Advisory Services & Technical Support**

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 and composites through to infrastructure and defence, we have the 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.

For more information, please visit: www.wtia.com.au
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 (0)2 8748 0100.

May 2017

FABTECH Mexico
2 to 4 May, Monterrey, Mexico
www.mexico.fabtechexpo.com

International Conference on Joining Materials
7 to 10 May, Helsingør, Denmark
www.iiwelding.org

National Manufacturing Week
9 to 12 May, Melbourne, Australia
nationalmanufacturingweek.com.au

Stainless 2017: 9th International Stainless Steel Exhibition
17 to 18 May, Brno, Czech Republic
www.stainless2017.com

ICWAM 2017: International Congress on Welding, Additive Manufacturing and Non-Destructive Testing
17 to 19 May, Metz, France
www.icwam.com

June 2017

Welding and Related Technologies of Young Scientists Conference
23 to 26 June, Kiev, Ukraine
www.wrtys.com.ua

70th IIW Annual Assembly and International Conference
25 to 30 June, Shanghai, China
www.iiw2017.com

July 2017

Royal Australian Chemical Institute 100th Anniversary Congress
23 to 28 July, Melbourne, Australia
www.racicongress.com

WeldTech Vietnam
4 to 7 July, Ho Chi Minh, Vietnam
www.mtavietnam.com

August 2017

YPIC 2017: Young Welding Professionals International Conference
17 to 18 August, Halle, Germany
www.slv-halle.de

September 2017

Eurosteel 2017
13 to 15 September, Copenhagen, Denmark
www.eurosteel2017.dk

October 2017

Welding Additive Manufacturing Conference
10 to 11 October, New York, USA
www.aws.org

November 2017

The Stainless Steel World Conference & Exhibition 2017
28 to 30 November, Netherlands
www.stainless-steel-world.net

WTIA & IIW EXAM DATES

IWS and WTIA Welding Supervisor
• 14 and 15 June 2017
• 9 and 10 November 2017

IWI-B and IWI-S
• 6 and 7 April 2017
• 31 August and 1 September 2017 (depending on numbers)
• 2 and 3 November 2017

For further information, please contact qnc@wtia.com.au.

Event Spotlight: National Manufacturing Week 2017
9 to 12 May, Melbourne, Australia

With manufacturing more competitive than ever, process improvements that enhance efficiency and boost profitability are all-important. With over 200 suppliers on-hand, National Manufacturing Week (NMW) will enable all manufacturing companies and professionals to source the latest products and services, in one place at one time. With dedicated zones for welding, digital manufacturing, and sustainable manufacturing and engineering, there really will be something for everyone. For further information, visit: www.nationalmanufacturingweek.com.au
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.