

Fusion

Newsletter of the Southern African
Institute of Welding

November 2019



SAIW
Southern African Institute of Welding



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John Tarboton at the helm of the SAIW

The Southern African Institute of Welding (SAIW) is pleased to announce the appointment of industry veteran, John Tarboton, as the association's Executive Director. Leveraging many years of experience in the stainless steel industry, Tarboton is responsible for driving the association's vision of promoting world-class excellence in welding.

In his new role, Tarboton is responsible for the day to day administration of the SAIW, leading the people, as well as maintaining and developing the SAIW as the leading national body for welding.

Tarboton takes over from Jim Guild, who occupied the position for the past few months on an interim basis after Sean Blake, executive director for the past four years, had left the institute a few months ago to further his own interests.

IN THE LONG TERM, WE NEED TO INCREASE OUR MEMBERSHIP AND DEVELOP AN ENGAGED MEMBERSHIP.

An experienced metallurgical and materials engineer, specialising in stainless steels, Tarboton has many years of experience in the research, development (laboratory, plant and customer) and technical marketing of new

and improved products, as well as technical customer services of existing products, applications and fabrication.

Tarboton spent 24 years at Columbus Stainless, where he held several positions, including engineer in training, senior metallurgist for R&D, R&D engineer and senior market consultant, among others. He later joined the South Africa Stainless Steel Development Association (Sassda), where he spent the last six years of his career. He joined Sassda as sectoral manager: fabrication, welding and technical advisor in May 2013, before he became executive director in September 2014, a role he occupied until his recent move to the SAIW.

"I have had a very interesting career, from being part of a team doing ground-breaking research to market development, customer services, and then association management. It has given me a broad background to be well equipped to take on this new role. However, this is certainly a daunting



John Tarboton

challenge but I believe we have an excellent team that is more than capable of driving our vision of promoting world-class excellence in welding, NDT and related technologies," says Tarboton.

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John Tarboton at the helm of the SAIW

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Commenting on some of his immediate areas of focus as the new executive director of the SAIW, Tarboton says the institute has done phenomenally well over the years but there is always room for improvement. "In the short term, we need to improve customer service as far as course administration and the delivery of courses is concerned. At a later stage we will need to ensure quality assurance of the courses themselves. We need to delight our students in the whole SAIW experience as we equip them for a career in welding," he says.

Tarboton also adds that the development of a regional presence in Mpumalanga, probably with the Steve Tshwete Local Municipality Local Economic Development committee, will take immediate priority. "In the long term, we need to increase our membership and develop an engaged membership. This will allow industry to work closer with the SAIW and to better utilise all our products and services for the good of SAIW and for the good of our industry," he adds.

Tarboton alludes to the fact that he comes at a time when the industry is grappling with an array of challenges. He is of the view that the wider fabrication industry is under immense pressure and over the last five years or so, has shown contraction, year after year. He believes that there is also no immediate prospect of things improving.

"The slowdown in public infrastructure spending and falling private sector capital spending is contributing to the lack of demand. In addition, growing public debt has slowed growth by increasing the cost of capital. Inefficiencies of State Owned Corporations, and high administered prices are both leading to a deterioration in the competitiveness of South African fabricators. The expected uptick in economic growth next year should lead to a marginal increase in demand which should filter through to our industry. However, for now, the metals fabrication industry remains in survival mode," concludes Tarboton.

MESSAGE FROM JOHN TARBOTON – Executive Director

Barely a month into my new role as Executive Director at the SAIW, it was a privilege and honour to celebrate my inaugural and the institute's 71st Annual Dinner with the welding and fabrication industry. Despite its long legacy and rich history, the reality is that our industry is under immense pressure and has shown successive contractions over the past five years.

The slowdown in public infrastructure spending and shrinking private sector capital spending is contributing to this lack of demand, as well as a host of other issues that have collectively led to a deterioration in the competitiveness of South African fabricators.

Despite this scenario, it is extremely encouraging to experience the ongoing support from our industry and I am particularly grateful for the contributions received from our event sponsors 71st Annual Dinner. From my side, a big thank you, without your support this event would not have been possible.

I would also like to extend a special thank you to Jim Guild for coming to the assistance of the Institute to stabilise the ship when he was needed the most, and to agreeing on a three-month handing over period with me to ease the transition.

Overall, let me put the spotlight on some of SAIW's achievements during the past year. Firstly, we are proud of the work being done by the SAIW Foundation. In particular, the 15 apprentices from ArcelorMittal, who are receiving training and are making excellent progress. Feedback from ArcelorMittal management has been highly positive.

Work has also been completed by our Business Development Manager Etienne Nell, on a brand-new occupational qualification supported by the Department of Higher Education and Training and the Quality Council for Trades and Occupations (QCTO). This will be implemented in the two Centres of Specialisation in Welding in the Boland and Uitenhage, with the aim of putting employers back in the seat of driving artisan training.

Our Training Manager, Shelton Zichawo, has completed his MBA in which he identified key areas of improvement in SAIW's quality of service. We look forward to harnessing

these insights to ensure that we are able to delight our students through the whole SAIW experience as we equip them for a career in welding.

We are also embracing the Fourth Industrial Revolution with a state of the art Yaskawa Robot Welding System to be installed at the institute in the near future. This machine has the latest 4IR technology to bridge the man-machine divide and will form the linchpin of our new Robotics course that will be launched in 2020.

The successful reintroduction of the SAIW Level 1 and 2 Inspection courses has also been well received as it assists with career development and allows our students to start earning sooner.

In addition, NDT Training Manager, Mark Digby, established the Phased Array training course that was launched in February this year in collaboration with the German NDT society.

On the global front, our Quality & Systems Manager, Harold Jansen, reports that the International Committee for Non-Destructive Testing Mutual Recognition Agreement was granted earlier this year, which ensures that our SAIW qualified and certified personnel enjoy international recognition.

SAIW Certification CEO & Qualification and Certification Manager, Herman Potgieter, also reports good growth in company certifications, despite these tough economic times, which shows that companies are ready and willing to adopt international standards to produce quality products.

Lastly, we have also received our ISO 17021 accreditation from SANAS, which ensures the competence, consistency and impartiality of SAIW Certification when providing audit and certification of management systems.

John Tarboton – Executive Director

2019 SAIW Awards

This year's awards were presented in four categories:

1. SAIW President's Award for NDT

The First training award of the night was the SAIW Presidents' award for the best NDT student. Most people will not appreciate that SAIW has been training NDT personnel for more than 30 years – the same period of time in which SAIW has offered training in welding. NDT is a very important part of the Institute's programmes and the SAIW seeks to encourage more young people to enter this field, which offers good career opportunities.

The Presidents' award recognises the top NDT student on Institute courses. The award is made in the name of the past Presidents of SAIW, who have helped guide the Institute to become a prominent part of the local welding industry and to be South Africa's reference point for high quality training in welding and NDT training.

This year, the SAIW Certification Governing Board gave the award to Quintin Ayres – for achieving distinctions in Magnetic Testing Level 1; Penetrant Testing Level 1 and Ultrasonic Wall thickness Testing Level 1 and combined with Visual Testing Level 1. He achieved an overall average of 90% for examinations undertaken during the period August 2018 to July 2019.



Quintin Ayres receiving the SAIW Presidents' award from longtime SAIW board member, Joseph Zinyana on behalf of SAIW President Morris Maroga.

2. Phil Santilhano Memorial Award

This year's second training award of the evening was the Phil Santilhano Award, which was presented to the best student on the Institute's courses in Welding Supervision and Inspection.

The award is made in the name of Phil Santilhano, who was one of South Africa's leading welding technologists and is best remembered for the ground-breaking work he did while employed by Vecor in research and development on Submerged Arc and Electro-Slag welding of heavy wall pressure vessels. He became the Institute's first full time employee when he was appointed Technical Director in 1977.

The award was presented to the best student on the Welding Co-ordination or Welding Inspectors training courses. Anyone attending Institute courses will testify that these courses are no walk in the park. A lot of information must be absorbed in a short amount of time. To be successful really takes special effort and for the first time ever in the institute's history, two awards were presented to the same person. The winner for the award was Quintin Ayres, who achieved a distinction in all three Welding Inspectors Level 1 examinations.



Quintin Ayres receiving the Phil Santilhano Award from Joseph Zinyana.

3. Best IIW Manufacturing Certification Company Award

This award is made in recognition of a company that has excelled in the ISO 3834 Certification Manufacturing scheme, by recognising the excellence of a manufacturing company with the implementation of a welding process control system.

The nominees for this award were:

CMP Aljimm Engineering – Located in Vereeniging, the company specialises in the use of carbon steels and thermo-mechanically treated steels, to fabricate a variety of products for their customers, including general steel structure fabrication, piping systems, pressurised equipment and mining equipment.

FP Engineering – This is an established general engineering company located in Durban, with many decades of experience in fabrication. The company specialises in steel fabrication and the manufacturing of tanks, silos, pressure vessels, dryers, hoppers, sugar and materials handling equipment, in a large, fully-equipped modern workshop and machine shop.

Hi-Tech Pressure Engineering – The company is focused on the design, manufacture and installation of design code compliant equipment. The company's expertise extends to high pressure piping systems and associated process vessels. Industries serviced include petrochemical, pulp & paper, mining, sugar and infrastructure.

ND Engineering – The company is known for its world-class fabrication of packaged boilers, heat exchangers, autoclaves, pressure vessels, reactors, petrochemical columns and many more types of equipment. This Durban-based company recently relocated to a brand-new world-class fabrication facility that has dramatically increased its fabrication capabilities.

Plant Design & Project Services – This is a multi-discipline engineering and construction company offering engineering, piping and structural fabrication, installation and plant maintenance services. The company is located in Secunda with ample experience in the design and maintenance of petrochemical plants.

During the evaluation of the nominees there were various assessment criteria used, which included, but were not limited to the following:

- Compliance to the requirements of the ISO 3834 scheme
- Implementation and involvement of the management team of the quality process

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2019 SAIW Awards

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- Continuous improvement of the welding quality processes
- Production of high quality product
- High degree of customer satisfaction

All nominees showed extremely high levels of involvement and engagement for various tasks and responsibilities by top management and the welding coordination team members. This led to excellent management of the different projects, producing high quality traceability documentation at all stages and at the end the production of high quality products in the different core areas of the nominees. All nominees were also utilising continuous improvement projects to further enhance their daily operations.

The SAIW Certification Governing Board adjudicated **Hi-Tech Pressure Engineering** be the recipient for this year's Best I/W Manufacturing Certification Company Award for their highly innovative, in-house developed ISO 3834 system.



Joseph Zinyana handed over the award to the company's representative Vinash Singh.

4. Institute Gold Medal Award for 2019

The final award for the evening was the Institute's Gold Medal Award. Introduced in 1966, it is the Institute's highest award and can be conferred to a company or an individual in recognition of outstanding contributions to welding technology or to the Institute.

For 2019, the award went to Sasol Secunda Inspection Authority. The award citation reads: "The award to Sasol Secunda Inspection Authority is made for the outstanding opportunities made available to local young school leavers to prepare for a career in the inspection field."



Paul Bruwer, Sasol Secunda Inspection Authority representative, receives the Gold Medal presented by Joseph Zinyana.

Special mention for Stefan Lottering at SAIW's Annual Dinner

At his maiden SAIW Awards, which took place at the 71st Annual Dinner on the 25th of October 2019, incoming Executive Director John Tarboton made a special mention of Stefan Lottering, who entered the SAIW Youth Welding Challenge held at the SAIW in January 2019.

Having undergone extensive training at ArcelorMittal in Vanderbijlpark, Lottering together with four other candidates, were sponsored by the Chieta to train at the SAIW under the supervision of SAIW lecturer, Samuel Mnguni and Chieta SAIW representative Etienne Nell.

During the subsequent SAIW competition, Lottering excelled by winning almost all the metal categories and achieving the highest mark overall. He entered the South African WorldSkills competition, held in the last week of February 2019 in Durban, and again outperformed the other competitors by winning all the categories.



Stefan Lottering receiving his Medallion of Excellence from Joseph Zinyana

Lottering was then selected to participate in the international event, which was held in Kazan, Russia, during August 2019. Lincoln Electric made their demonstration area available to Lottering to train on the equipment to be used in Kazan – once again generously sponsored by Chieta.

During the competition in Russia, he proved to be a formidable competitor by outperforming some of the best candidates in the world, achieving a remarkable 17th position from 39 countries. For the first time since South Africa's return to the International arena for Welding, a South African was honored with a Medallion of Excellence.

SAIW Awards – Quick View

Glamour and glitz at the 71st Annual Dinner

Let's face it, once a year at the SAIW Annual Dinner, as an industry we all feel truly inspired by the celebratory spirit and the opportunity to brush off the cobwebs from the black dinner suit and that glamorous sparkly dress for that famous annual party! This year was no different, the welding industry came out in full force, delivering the glamour and glitz that we have come to know the annual event for.



SAIW Awards – Quick View



ISO 3834 Company Certification

Assuring Quality Product

ISO 3834 is certainly one, if not the most important Welding Quality Management systems during the fabrication process in the welding fabrication industry. That much we would all, especially the end users of weld fabricated products, agree. To ensure the proper quality of welded product and to optimise the manufacturing cost, it is set out in the ISO 3834 that the whole welding process must be controlled from the very start. The main aim of the ISO 3834 implementation at a manufacturing company is to build quality into the product and not to subject the product to in-depth inspections to approve the product. One of the major benefits of a successfully implemented and

maintained system is the cost saving because of initial compliance to the relevant specifications without any additional rework that has to be performed. Rework can cost up to 4-5 times the initial manufacturing cost. To ensure that quality welded product is delivered every time, it is strongly recommended that the company implement a welding quality management system such as the ISO 3834 system. Below are companies that have recently received their ISO certification from the SAIW Certification, which is accredited by the International Institute of Welding (IIW) as well as SANAS for company certification.

Sirix Engineering, Fabrication & Tube Manipulation cc	8 Kruger Place, Unit 2, Phoenix Industrial Park, Durban	Comprehensive ISO 3834 Part 2	Pressure Piping, Pressure Vessels, Pressure Equipment, Boilers Tubes, Heat Exchangers, Sheet Metal and Structural Steelwork	Carbon steels, quench & tempered steels, creep resistant steels, austenitic stainless steels and high carbon steels.	SMAW, GTAW, MIG/MAG
Beruseal cc	18 Beechgate Crescent, Southgate industrial Park, Umbogintwini, Amanzimtoti, Kwa-Zulu Natal	Comprehensive ISO 3834 Part 2	Pressure Equipment and On-line Leak Sealing Enclosures.	Carbon steels	MIG/MAG
New Nation Construction	5 Jan Street, Rocky's Drift, Witrivier	Comprehensive ISO 3834 Part 2	Pressure Vessels, Pressure piping, Pressure Equipment, Railway Components, Heaters/Boiler, Heat Exchangers, Tanks/containers. Containers, Flares, Structural Steel & Sheet Metal	Carbon steels, austenitic steels, high carbon steels >0.25 %C	SMAW, GTAW, GMAW, FCAW, SAW
Prime Probe	Workshop 51, Martial Eagle street, Secunda, Mpumalanga	Comprehensive ISO 3834 Part 2	Pressure Vessels, Pressure Piping, Pressure Equipment, Heaters/Boilers, Heat Exchangers, Tanks/ Containers & Structural Steel	Carbon steels, quench & tempered steels, vanadium alloyed steels, creep resistant steels, austenitic stainless steels, duplex stainless steels, high carbon steels >0.25%.	SMAW, GTAW
Alstom Ubunye	No1 Marievale Road, Vorsterskroon, Nigel, Gauteng	Comprehensive ISO 3834 Part 2	Railway Components, Sheet Metal and structural Steelwork	Carbon steels, thermomechanically treated steels, austenitic stainless steels, high carbon steels, aluminum alloys.	GTAW, MIG/MAG
Latham Engineering Africa (Pty) Ltd	Building C11, Denel North, Kempton Park.	Comprehensive ISO 3834 Part 2	Pressure Vessels, Pressure Piping, Pressure Equipment, Heaters/Boilers, Heat Exchangers, Tanks/ Containers & Structural Steel	Carbon steels, creep resistant (Cr-Mo) steels, ferritic/martensitic/ precipitation hardened stainless steel, austenitic stainless steel, high carbon steels >0.25%C, aluminum alloys.	GTAW & GMAW
MRG Engineering & Fabrication	27 Sage Road, Jacobs, Durban, KZN	Comprehensive ISO 3834 Part 2	Pressure Vesels, Pressure Piping Pressure Equipment, Heaters/Boilers, Heat Exchangers, Tanks/ Containers, Pressure Safety valves & structural Steel.	Carbon steels, creep resistant steels, austenitic stainless steel, high carbon cteels >0.25%C	SMAW, GTAW, GMAW

Want to know more about ISO 3834 implementation? Get in touch with Kimber-leigh van der Merwe; Company Certification Co-ordinator at the SAIW, on 011 298 2109 (Direct) or email her on Kimberleigh.vandermerwe@saiw.co.za

In the SPOTLIGHT



KURT ROSENBERG

WITH THE GLOBAL MOVE TOWARDS INDUSTRY 4.0, THE WELDING INDUSTRY IS EQUALLY INVOLVED IN THIS PROCESS OF CHANGE, AND IS PROBABLY ONE OF THE PACESETTERS IN THIS REGARD. KURT ROSENBERG, MD OF YASKAWA SOUTHERN AFRICA – ROBOTICS DIVISION, EXPLAINS SOME CURRENT AND FUTURE TRENDS.

F: Who is Kurt Rosenberg?

KR: I completed an NDip Architectural Technology at Wits Technikon in 1994, before going on to work at various international architectural, construction, interior and urban design companies over a period of 10 years.

I completed further studies in Project Management and then a PMD in Business General Management and Economics, as well as Strategic Sales Management at the Gordon Institute of Business Science (GIBS) in Johannesburg.

I joined YASKAWA Southern Africa in 2006. I have since been involved in all aspects of the business including robotic sales, internal systems development, CAD and procedures development, among others. I then moved into the position of Sales Director.

When Terry Rosenberg, the founder of Robotic Systems SA (now YASKAWA Southern Africa) and a doyen of the robotic welding industry in South Africa, stepped down in 2016, I was appointed the new Managing Director.

For fun and relaxation, I am a PADI scuba instructor, enjoy competitive mountain biking and playing guitar.

F: How long have you been in the welding industry and why did you choose this industry?

KR: I have been in the industry for 13 years. For me, the unique challenges faced in an ever-changing and technologically hungry world, and more specifically Southern Africa, are profound, and as such, offer a vast spectrum for learning and development of people, processes and technology.

The combination of our world class YASKAWA Robotic products and capabilities, and globally accepted welding technology, open a door to provide next-level, cutting-edge welding performance to the industry.

F: What does your company do?

KR: YASKAWA delivers innovative industrial robotic solutions for virtually every industry, be it automotive, manufacturing or packaging. This includes robotic arc and spot welding, assembly, coating, dispensing, material handling and material processing as well as robots designed for laboratory and clean room applications.

The YASKAWA Group's global network includes business bases in 29 countries and production bases in 10 countries. It is one of the largest global manufacturers of industrial robots, with an installed base of more than 350 000 robots worldwide.

F: How did you get involved with the SAIW?

KR: Our relationship with the SAIW started many years ago. As the centre of excellence in the welding field in SA, the SAIW has always been pivotal to the industry in which both our organisations operate.

Support for welder training is paramount to support for the industry, and indirectly, critical to the support of our Robotic Welding Division. More recently though, YASKAWA Southern Africa has been collaborating with the SAIW on the formation and establishment of a Robotic Welding Training curriculum.

This new initiative is key to providing a support platform for advancement of welding technology, by allowing new skilled, as well as advanced level candidates, access to the next level of expertise they will require when entering a very competitive job market.

F: What is your view of SAIW's contribution to the South African welding industry?

KR: The core skills and advanced learning possibilities that the SAIW engages in and offers, is a critical component for our South African

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In the SPOTLIGHT *Continued from page 8*

market and economic development. The change required to ensure our amazing country's future lies heavily in the hands of the manufacturing sector.

Is the anywhere better to position yourself, than in the fundamental building phase of skills development? This is where I believe the SAIW shines – developing people that can develop an industry.

F: *With the global move towards Industry 4.0, is the welding industry moving in line with this trend?*

KR: YASKAWA'S Industry 4.0 concept "i³ Mechatronics" brings together classical mechatronics, information and communication technology with digital solutions such as artificial intelligence (AI), Big Data and the Internet of Things (IoT). "i³" stands for integrated – intelligent – innovative.

Relevant process and system data is collected in a scalable database in real time, analysed and learned by AI optimisation. Visualisation is direct and comprehensible in the "YASKAWA Cockpit" software platform. The present status of every machine can be mapped concurrently in real time and correlated with other data sources, for example for coordinated predictive maintenance.

The data can also be easily be forwarded to existing ERP, MES, Big-Data or AI environments in observance of the most stringent safety standards, enabling well-founded decisions on this basis.

F: *What are some of the key trends currently taking place in the industry?*

KR: Efficiency is perhaps one of the key trends we see. Efficiency of design, cost, material, people and machinery. The accumulated

experience and significant level of expertise South Africa has to offer, is staggering.

As such, I believe that to realise the true benefits of such a trend, industry professionals and thought leaders need to consolidate strategies and actions into a combined approach.

YASKAWA has adopted the term "Humatronics". Although this is really just a catchphrase, the deeper meaning speaks to the need for true collaboration between humans and technology to support a world in need of solutions.

The realisation of this concept, in a multitude of industries, speaks to the need for efficiency in much of what we currently do in the industry.

F: *As the technological revolution continues apace, what are some of the likely trends to be seen in the welding industry in the next two years?*

KR: As we track much of what happens on a global scale, we see a continued and strong drive towards automated welding technologies. This is as a result of the fast pace and constant increase of requirements for goods by consumers.

This is driven substantially by the automotive industry where automated welding is a non-negotiable due to the safety critical nature of the products. Many industries are following suit and adopting these combined technologies, in order to stay ahead of the competition and provide consumers with what they want.

It then stands to reason, that the avenue the SAIW is beginning to adopt, is most definitely the right one, as it is in alignment with where the market (job and product) is heading.

**IMPORTANT
NOTICE**

SAQCC CP Inspectors

Please note that the SAQCC CP committee has decided that the SAQCC CP Limited category of certification, which usually applies to persons inspecting only air receivers or only small autoclaves, is to be phased out with effect from June 2020. From that time only the Unlimited category of certification will be offered.

Please note that this does not affect existing certified persons who will be able to retain the Limited certification scope subject to meeting the normal renewal and re-certification requirements.

More information will be published in later editions of Fusion.





A CAREER IN WELDING

In recent decades welding has become a dominant process in the fabrication of industrial products and in the building of structures from steel. It is used in all phases of production and is needed not only nationally but also internationally in almost every industry ranging from micro-electronics to construction of petrochemical plants, power generation, buildings and transport. Due to the diversity of welding-related projects, there is excellent flexibility to switch industries without the need to change your career.

The fact that welding is in a strong growth trend accounts for the mounting interest in it as a career. Completing a trade course in welding can virtually assure you of gainful employment opportunities for advancement during your career. Similarly, those who become welding inspectors, welding coordinators, non-destructive testing (NDT) technicians, professional welding engineers or designers can look forward to extremely rewarding career opportunities.

SAIW has been offering training courses in both welding and non-destructive testing technologies since the late 1970s. You can choose to be a **practical welder** in which case, you will join materials together using any of the various welding processes. As a welder you can progress your career by studying further to position yourself to be a welding supervisor/foreman by doing any one of our welding coordination courses. The **welding coordination** courses are not only for welders. People hoping for a career in leading welding teams and managing the day-to-day operations of a fabrication shop can enrol on these courses too, for example; welding engineer, welding technologist, welding specialist etc.

SAIW courses also present opportunities for you to work as a **welding inspector** in which case in your career you will be responsible for verifying that the welders are following their work instructions. Not only do you verify the welders but also the welding supervisors to ensure they are doing their work according to approved and implemented procedures. As a welding inspector you can also work in quality assurance where you compile the relevant information for records on how a product was manufactured.

The SAIW also offers **Non-Destructive Testing** courses (NDT) in six different testing methods. NDT personnel form part of the chain of various fields of expertise which are used to ensure the world is

using high quality products which pose little risk to the end user. NDT personnel test materials or products for any imperfections without destroying the products or materials and is not only limited to testing of welds, but can be extended to various product sectors such as castings, forgings, tubes etc. and applied in most of the industrial sectors such as pre-and in-service testing, power generation, petrochemical etc. This is achieved by using various applied scientific principles and therefore a career in NDT will never stagnate. There will always be the opportunity to diversify into other methods or alternatively you can specialise in one or more methods to an advanced level of competency.

SAIW courses are intended to meet **best practice international standards** and many are accredited by the International Institute of Welding (IIW) or International Committee for Non-Destructive Testing (ICNDT) Mutual Recognition Agreement (MRA).

SAIW inspection courses also fulfil the requirements of local certification programmes for inspection personnel (SAQCC IPE and CP) which are approved by the Department of Employment and Labour.

SAIW practical welding courses are accredited by IIW for the International Welder (IW) programme and welder apprenticeships by QCTO.

SAIW offers training courses at the Johannesburg headquarters in Johannesburg, Durban and Cape Town. Many SAIW courses are suitable for presentation at in-company training facilities.

CHOOSING A CAREER IN WELDING AND USING THE SAIW TO DELIVER YOUR PREFERRED PROGRAMME WILL ENSURE YOU A BRIGHT AND PROSPEROUS CAREER, SO REGISTER TODAY!

For more information contact our Training Administrator on 011 298 2111.

FOCUS ON COURSES

Heat Treatment Practitioner

Heat Treatment Practitioner performing local heat treatment of welded fabrications on site, or in a workshop, using resistance heating, will benefit from this course. The course is also suitable for maintenance personnel who are responsible for supervising heat treatment operations. Candidates who preferably have a Grade 12 qualification as well as experience in engineering and/or metal working is recommended.

COURSE CONTENT:

Theory:

Basic metallurgy; heat treatment definitions; welding processes; welding effects on materials – why is heat treatment necessary?; heat treatment cycles, heating and cooling rates, soaking temperatures, soaking times; code and material specification requirements for welding; pre-heat, post-weld heat treatment, normalising, annealing, hydrogen removal; methods of heat treatment; equipment.

Practical:

Determining pre- and post-weld heat treatment requirements to codes and standards; determining heating and insulation band widths; determining heating configurations on nozzles; setting up equipment for weld heat treatments – thermocouples, heaters, insulation; operating heat treatment equipment.



5-Day Engineers – Appreciation of Welding

In many companies a mechanical or electrical engineer, engineering superintendent or engineering supervisor is given the responsibility of managing 'the welding department'. Often this engineer will have absolutely no welding background and almost certainly his/her university or college study programme will have included no training in welding technology. If the engineer is lucky he/she may be assisted by an experienced welder or even a welding supervisor but this is not enough to accept the responsibilities assigned to his/her job.

For these reasons the 5-Day Appreciation course is one of the Institute's oldest courses and one of its most successful. The course was first developed in the early 1980s when it was derived from an in-company training course. It has been continuously updated to ensure industry relevance. Many engineers from all types of large companies and parastatals have attended the course as part of their professional development. It is, however, an extremely important course for engineers working in smaller companies where there is very little in-house back-up for the engineer who has to be a 'jack-of-all-trades'.

The course introduces engineers to the complexities of welding, informing them of what can go wrong and the consequences of a failure including economic disaster. It covers the common welding processes and their applications. It describes the effect of welding on materials and welding defects and their causes. It looks at cost issues, the need for qualified welding procedures and how to go about specifying them. Importantly engineers are encouraged to bring their welding experiences and problems to the course for sharing with the class in discussion. The case history discussion period is held at the end of the course and is often one of the most helpful parts of the course for the engineer. It's very much about helping the engineer to know and be aware of when he/she needs to bring in specialist help.

The 5-Day Appreciation course can be held in-company and anyone interested in running the course should call Shelton Zichawo on 011 298 2100.



NDT – PART 1

Modifications to the Company Written Practice as required by the 2019 edition of ASME BPVC

The following changes to the recommended practice ASNT SNT-TC-1A, have been mandated by the latest edition of the ASME Boiler and Pressure Vessel code and should be considered when creating a company's written practice. The wording in red shows changes that needs to be considered to ASNT SNT-TC-1A.

Please note that only sections or paragraphs requiring modifications have been included in this summary.

Recommended Practice No. SNT-TC-1 A Personnel Qualification and Certification in Nondestructive Testing

1. Scope

- 1.4 It is recognized that these guidelines may not be appropriate for certain employer's circumstances and/or applications. **When developing a written practice as required in ASME Section V, the employer shall review and include the detailed recommendations presented in SNT-TC-1A–2016 and ASME Section V including this Mandatory Appendix. Modifications that reduce or eliminate basic provisions of the program such as training, experience, testing, and recertification shall not be allowed.**

2. Definitions

- 2.1 Terms included in this document are defined as follows:

2.1.9 Grading Unit:

A Qualification Specimen can be divided into sections called grading units, which do not have to be equal length or be equally spaced. Grading units are unflawed or flawed and the percentage of flawed/unflawed grading units required **shall** be approved by the **NDE** Level III.

3. Nondestructive Testing Methods

- 3.1 Qualification and certification of **NDE** personnel in accordance **with ASME Section V** is applicable to each of the following methods:

- Acoustic Emission Testing
- Electromagnetic Testing
- Ground Penetrating Radar
- Guided Wave Testing
- Laser Testing Methods
- Leak Testing
- Liquid Penetrant Testing
- Magnetic Flux Leakage
- Magnetic Particle Testing
- Microwave Technology

- Neutron Radiography Testing
- Radiographic Testing
- Thermal/Infrared Testing
- Ultrasonic Testing
- Vibration Analysis
- Visual Testing

4. Levels of Qualification

- 4.1 There are three basic levels of qualification. The employer may subdivide these levels for situations where additional levels are deemed necessary for specific skills and responsibilities.

- 4.2 While in the process of being initially trained, qualified, and certified, an individual should be considered a trainee. A trainee **shall** work with a certified individual. The trainee **shall** not independently conduct, interpret, evaluate, or report the results of any **non-destructive examination**.

- 4.3 The recommended technical knowledge and skill sets for the three basic levels of qualification are as follows:

4.3.1 NDE Level I.

An **NDE** Level I individual **shall** have sufficient technical knowledge and skills to be qualified to properly perform specific calibrations, specific **NDE**, and specific evaluations for acceptance or rejection determinations according to written instructions and to record results. The **NDE** Level I **shall** receive the necessary instruction and supervision from a certified **NDE** Level II or III individual.

4.3.2 NDE Level II.

An **NDE** Level II individual **shall** have sufficient technical knowledge and skills to be qualified to set up and calibrate equipment and to interpret and evaluate results with respect to applicable codes, standards, and specifications. The **NDE** Level II **shall** be thoroughly familiar with the scope and limitations of the methods for which qualified and **shall** exercise assigned responsibility for on-the-job training and guidance of trainees and **NDE** Level I personnel. The **NDE** Level II **shall** be able to organize and report the results of **NDE activities**.

4.3.3 NDE Level III.

An **NDE** Level III individual **shall** have sufficient technical knowledge and skills **to develop, qualify, and approve** procedures, **establish** and **approve** techniques, **interpret** codes, standards, specifications, and procedures; and **designate** the **NDE** methods, techniques, and procedures to be used. The **NDE** Level III **shall** be responsible for the **NDE** operations for which qualified and assigned and shall be capable of interpreting

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NDT – PART 1 *Continued from page 12*

and evaluating results in terms of existing codes, standards, and specifications. The **NDE** Level III **shall** have sufficient practical background in applicable materials, fabrication, and product technology to establish techniques and to assist in establishing acceptance criteria when none are otherwise available. The **NDE** Level III **shall** have general familiarity with other appropriate **NDE** methods, as demonstrated by an ASNT Level III Basic examination or other means. The **NDE** Level III, in the methods in which certified, **shall** have sufficient technical knowledge and skills to be capable of training and examining **NDE** Level I, II, and III personnel for certification in those methods.

5. Written Practice

- 5.1 The employer shall establish a written practice for the control and administration of **NDE** personnel training, examination, and certification.
- 5.2 The employer's written practice **shall** describe the responsibility of each level of certification for determining the acceptability of materials or components in

accordance with **ASME Section V, and the referencing Codes , Standards and documents.**

- 5.3 The employer's written practice **shall** describe the training, experience, and examination requirements for each level of certification by method and technique.
- 5.4 The employer's written practice **shall** identify **NDE** techniques within each method applicable **to the written practice.**
- 5.5 The employer's written practice shall be reviewed and approved by the employer's **NDE** Level III.
- 5.6 The employer's written practice shall be maintained on file.

The content is taken from ASNT SNT-TC-1A (2016) with modification from ASME BPVC (2019) Section V Subsection A Article 1 Mandatory Appendix III added.

Words in red indicate changes

Strikethrough words mean they need to be removed

JOB KNOWLEDGE 139

Measurement of Arc Welding Parameters

To confirm that a weld has been made to specification it is usually required to measure and often document the parameters that have been used. For arc welding the main parameters are as follows:

- Welding current
- Arc voltage
- Travel speed

These parameters can be used to calculate the heat input, which is derived from the arc energy. See this [FAQ on the difference between heat input and arc energy](#) for more details.

The other parameters which may be measured and recorded are as follows:

- Wire feed speed (for MIG/MAG) and other processes with a filler wire
- Gas flow rate (shielding, backing and plasma)
- Temperature (pre-heat, inter-pass and post-weld heat treatment)

In most cases the mean values of the parameters over the time of the weld can be recorded and used to calculate heat input. A simple meter can be used for this, but it is better for quality assurance to have documented values. A number of instruments exist which have been specifically designed for this purpose. Generally, they provide a paper printout with mean values over a second or so. Some of these instruments allow the length of the weld to be input so that arc energy (kJ/mm) can be calculated.

When measuring voltage and current it is important to do so correctly. Although current can be measured anywhere in the circuit, Figure 1, it

is important to ensure that all the current passes through the cable and is not, for example, conducted elsewhere through the component or through a leakage path to earth.

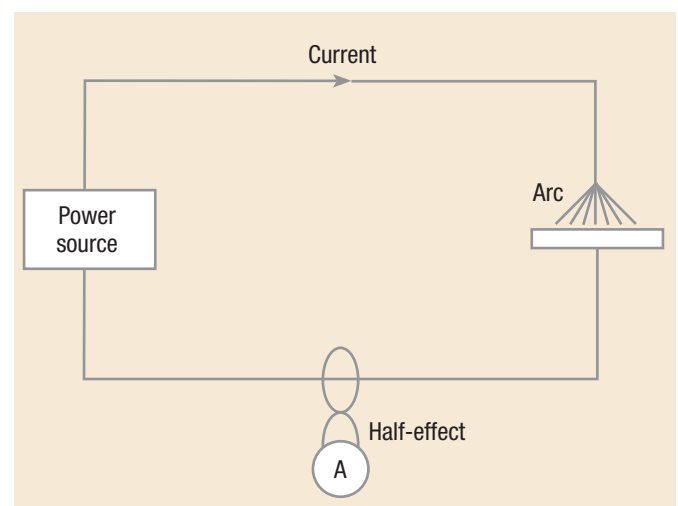


Fig. 1. Current measuring technique, 'A' showing the connection for the sensor

Current is normally measured by a Hall effect probe clipped around the cable. The current rating and accuracy of the probe needs to be taken into account.

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JOB KNOWLEDGE 139 *Continued from page 13*

Voltage measurement is a bit more difficult to get right as the voltage will vary depending where the connections are made. For true arc voltage, it is important to measure as close to the arc as possible, Figure 2. For MIG/MAG, a connection on the drive rolls, back at the wire feeder, will suffice. However, the voltage measured across the arc will be lower than that measured across the power source terminals, possibly by several volts, depending on the length and diameter of the welding cables and the amplitude of the welding current.

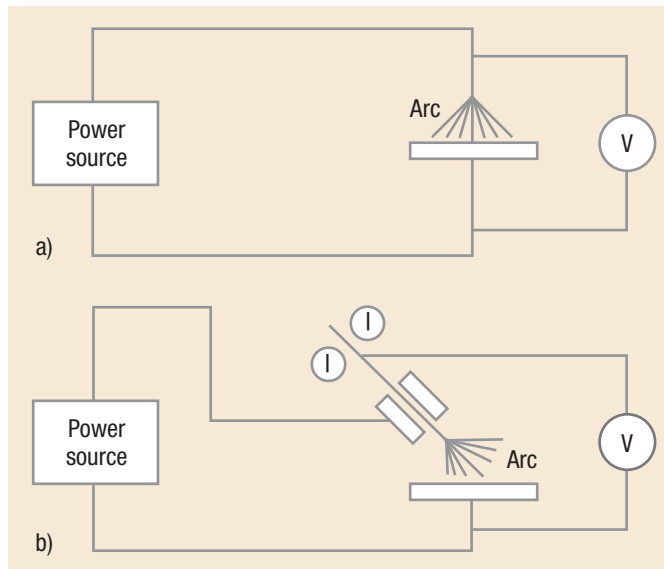


Fig. 2. Voltage measuring technique a) Connection to the back of the TIG torch; b) Connection to the back of the MIG gun

Care should be taken when measuring arc voltage in TIG welding as the high voltage used for starting the arc may damage the instrumentation unless it is specifically designed for arc monitoring.

Some standards now require heat input to be calculated from instantaneous values and this requires an instrument that can

accurately record the waveform of the voltage and current and perform the calculation up to 5,000 times per second or more. An example of such an instrument is shown in Figure 3. Several other manufacturers provide similar instruments.

Such instruments can record and display the current and voltage waveform from pulsed TIG and MIG/MAG processes including controlled dip transfer and multi-pulse techniques.

Wire feed speed can be measured by clipping a tachometer to the wire or by attaching a sensor to the wire feed drive rolls. Temperature is measured using a thermocouple or resistance temperature detector (RTD) probe in contact with the surface or, alternatively, an infrared non-contact device. Although gas flow can be measured with a bobbin type gauge, for recording the value a mass flow type instrument is required.

Limits can be set (typically +/-10%) to indicate if the parameters have deviated outside of the procedure and statistical process control (SPC) can be used to stop or correct a process before problems occur. However, this is a relatively crude technique and TWI is investigating more advanced digital processing.



Fig. 3. AMV 4000 Data Logger – Triton Electronics Ltd

BRANCH NEWS

Durban

The Durban branch has been busy all year, with a minimum of one class being held every week. Notably, the branch was involved in the testing of apprentice welders at LIV Village in Cottonlands, Verulam on 25-27 September.

Cape Town

Since the previous edition of Fusion, SAIW's Cape Town branch has been hard at work, running a couple of courses. The branch ran the first Welding & Fabrication Inspector Level 1 course with its first group and the second intake is currently underway. On a separate note, the branch also ran the Competent Persons – Steam Generators training.

The CT branch also has two visual Testing Level 1 courses in its NDT department. Meanwhile, its second L1 Bridging course for the year is currently on the go. Moreover, the CT branch ran a second Welding

Quality Control course, while its second ASME course starts on the 4th of November.

The branch also had its member, Arnold Meyer from Afrox, presenting on the "Advantages of using cored wires for certain applications – FCAW and MCAW" – at an evening meeting held on the 19th of September.

From the sporting front, the CT branch has its Western Cape Sports Day scheduled for the 21st of November. Get in touch with Western Cape representative Liz Berry for more information.



Qualification and Certification



CONGRATULATIONS TO THE PEOPLE BELOW WHO RECENTLY ACHIEVED QUALIFICATION AND CERTIFICATION

<p>COMPETENT PERSON-PRESSURE VESSEL</p> <p>Erasmus AW Kleynhans J Koekemoer J Smith S Van Rooyen JC</p> <p>Competent Person Boilers</p> <p>Van der Walt KA</p> <p>Inspector of Pressure Equipment</p> <p>Burger ZD</p> <p>MT 1</p> <p>Jonker K Mabaso DN Mhlupheki A Sibanda M</p> <p>MT 2</p> <p>Hattingh KT Kunneke TD Mjwara BP Muller J Ndhlovu M Voget T</p> <p>PT 1</p> <p>Mtshozeni LV Sibanda M</p> <p>PT 2</p> <p>Archibald DC</p>	<p>Govender D Laurens JR Ntshangase LC Paulse SE Petersen GQ Thwala AM Voget T</p> <p>UT 1</p> <p>Grobler AC Jonker K Mohlala TM Willenberg GA Zikhali SM</p> <p>UT 2</p> <p>Mashabane D Moahloli KK</p> <p>UT WALL THICKNESS</p> <p>Hlophe SS Johannes M Meyer G Pfungwa K Van Niekerk N</p> <p>PAINTING INSPECTORS</p> <p>Anderson R Gerber T Kayne M Madzwili NE Motau MF Phatlane LM Senekal CJC Smit DP</p>	<p>ASME</p> <p>Ayres QR Benjamin W Botha C De Witt AH Erentze JA Keulder A Lekhuleni N Mabuza NK Mahlangu SB Manana LC Marebane YL Marques JP Maseko BA Maseko KN Mazibuko BNN Mobela E Norris LA Rusenga B Scheepers J Selepe F Sibeko MN Sibeko SA Sithole SP Van der Merwe JM</p> <p>IWIP- BASICS</p> <p>Bahoumina UG Baloyi M Bhude ET Dlamini GJ Dlamini MS Fraser AA Gama SE Gobey JK Hlophe SA Houghton SL</p>	<p>Houston T Kgaphola TB Khoza SO Khumalo BN Khumalo SC Khumalo TM Kistnasamy V Lushaba PM Luthuli TN Mabaso MZ Mabaso N Mafokane T Mafuleka NJ Mahlalela F Mahlalela N Makgoba RR Makhubu SI Marubini N Mashinini KR Mashinini P Masilela DN Mathumba ET Mbatha LI Mdaka DP Mdaka NA Mkhonza MT Mkhwanazi AD Mkhwanazi XS Mlotshwa SC Mnguni NP Moeketsi DP Mohlala TG Mokoena MA Mokoena MP Mongo I Mpanza MM</p>	<p>Mthimunye W Nala MM Ndlovu T Ngcobo T Ngomane SS Nkosi TP Nkosi XP Nkosi MV Nkosi PJ Nkutha ZA Ntshangase M Prinsloo ST Sambo S Selepe BH Shabalala SE Shabangu SS Shai R Sibiya L Silogram EJ Simelane Z Singh J Siphali G Subroyen MM Thabethe NM Thwala AS Peyana V Van Rensburg AL Vilikazi HG Zuma SH</p> <p>Basics of Welding Control</p> <p>Boikanyo DR Dames D Govinder R Isaacs CD</p>	<p>Jonga ZP Keyser JN Khan N Lombaard JJ Mapodile SE Mashego MS Mashongwa NT Moloi IF Motete OR Mthethwa SN Mwanza P Ntuli KP Ramlall A Ramulifho C Ziervogel M</p> <p>RT 1</p> <p>Hattingh T</p> <p>RT 2</p> <p>Tugwana MD</p> <p>Visual Testing</p> <p>Kaseke F Makhurupetji PL Maleka LD Mashabane D Motukisi E Msimang SNS Nxumalo TB Thwala AM</p> <p>RT Interpreters</p> <p>Botha MS Matsapola ML</p>
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Meet the SAIW Team

The success of every organisation hinges on its people. The SAIW has propelled itself to the summit of welding-fabrication training in South Africa. But, behind this feat is a team of committed individuals who excel and give their all in what they do every single day. One such person is Laetitia Dormehl, senior training administrator, who is the first point of call for every student wishing to go through our training regime.

Administration is the backbone of any department in an organisation. An effective administrator is the connection between an organisation and its various stakeholders and ensures the smooth flow of information from one part to the other.

Such is the importance of Laetitia Dormehl, the training administrator at the SAIW, who is the link between the organisation and all aspiring students. She is the senior training administrator for all courses offered by the SAIW, and is, therefore, the first point of call for anyone looking to be part of our training revolution.

Her role entails booking and assisting all students on the online system, as well as serving walk-in customers, providing both accurate information and prompt service by being approachable, helpful, respectful and professional at all times.



Laetitia Dormehl

Laetitia has been with the SAIW since July 2010, having started in the accounts department as a debtors' clerk. Testimony to her outstanding capabilities is that she was promoted to the training department in less than two years. "I had to learn to work directly with the public. It was a

bit of a bumpy ride at the start, but it eventually went well. I have been in the training department since 2012, and still going strong," she says.

Laetitia has since fallen in love with the welding industry. She finds it "very interesting", especially the Non Destructive Testing (NDT) methods and fault finding.

Born and bred in Germiston, in the East Rand, Laetitia matriculated at the Afrikaanse Hoerskool in Germiston in 1995. She started working at the age of 19 as a receptionist. She has also previously worked as an estate agents for several years, before taking a job at a fresh produce market for some time. She decided to study further and gained knowledge in the fields of bookkeeping and accounting.

Wedding bells are ringing for Laetitia! She is engaged to be married and has two grown kids. Laetitia is a firm lover of the outdoors and camping. Being outside makes her feel inspired, rejuvenated and motivated to explore even more.

SPORTS DAY

A joint sports day between the SAIW, the Southern Africa Stainless Steel Development Association (Sassda) and SAPSDA (South African Pump Systems Development Association) was held on the 17th of October at the Irene Country Club.

There was a shot gun start at 11h00 and the format was a Mystery Golf Competition – a Fourball Alliance with Mystery Scoring on each hole.

▼ The overall winners of the golf day were Pumps and Valves.



L-R: Tinus, Leon, Mankabe (Sassda), Hunk & Bernard.

This is how it worked: players played a Fourball Alliance, and on reaching the flag on the tee, each was marked with instructions on how to score on that particular hole, for example: Hole 1: Multiply Player A & B and Hole 2: Multiply Player C & D.

The mystery scoring applied to all 18 holes. Golfers who did not have an official handicap played off an 18 handicap.

▼ Winners Bowls



L-R: Tokkie, Francois, Chantal and Mankabe (Sassda)

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