

Fusion

Newsletter of the Southern African Institute of Welding

February 2014



*Fabrication of Pipes in Welded
Process Plants PG3*

Economy of Steel Imports PG6

*Appreciation of NDT for
Engineers PG9*

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Message from The Executive Director

Although we expect a tough year, SAIW is planning regional expansion with Cape Town and Durban being the first targets. There is an increasing demand for Institute services in both centres. We have already secured facilities in Cape Town and expect the branch to be operational by May. There is even greater demand for courses and other services in KZN so finding a facility in Durban is a priority and our Regional Representative, Ann Meyer, is investigating options. Having a satellite facility in Mpumalanga is also an important goal because it will take pressure off of the Johannesburg building, which is working at capacity, and it will take the Institute nearer an important section of our clientele.

When we meet at the AGM in May members will be asked to support the Council's intention to convert SAIW from an Unincorporated Association to an Incorporated Not for Profit Company, registered under the Companies Act. The Memorandum of Incorporation and reasons for the proposed change will be explained in a communication which will accompany the notice for the AGM to be held on the 9th of May. Expect to receive this communication in the next few weeks.

We hope to have a packed calendar of events with seminars and golf days featuring already. Please don't forget the Young Welder of the Year Competition which will be held in the last quarter of the year. It is

still some time away but if we identify good young welders now we can start preparing them for success. If you need information on the competition, please make contact with Etienne Nell.

This is likely to be the last edition of Fusion published before we say goodbye to our President, Professor Madeleine du Toit, as she is moving to Wollongong University. The Institute and the country are losing an outstanding professional person who is also charming and approachable. We hope that the move works out well for her and thank her for the leadership she has given to the Institute over the last four years.



Jian Guild

Executive Director
 Southern African Institute of Welding

Annual General Meeting

The SAIW Annual General Meeting will be held on Friday the 9th of May at 15h30. Members are called upon to attend this AGM as a significant proposal will be tabled before members to adopt a resolution to become a registered Not for Profit Company (NPC) in compliance with the New Companies Act of 2011. The meeting will be held at the SAIW head office auditorium at 52 Western Boulevard, Off Main Reef Road, Johannesburg (GPS coordinates 26° 12,638'S | 28° 01,596'E).

Also on the agenda will be council and committee elections and the President's report. It is therefore doubly important for members to attend and ensure stability and participation in directing the future of the industry they operate in.



FABRICATION OF PIPES in welded process plants

By Dr Tony Paterson

Welded fabrication is essential to the manufacture of a range of engineering components. These vary from large structures such as ships and bridges, to complex structures such as aircraft engines, or miniature components for microelectronic applications. A particular application of welding is in pipeline fabrication.

Industries which involve pipeline fabrication include aerospace, boiler tubes, nuclear piping, hydraulic pressure, liquid and gas lines and, also, process plants, these including those related to industries regulated by health legislation. Process plants are typically made up of pipes (internal diameter defined) or tubes (external diameter defined) linking treatment tanks, heat exchangers or distillation columns. Process plants serving the food, pharmaceutical and beer and beverage sectors need to meet both structural imperatives, to resist the mechanical loads produced, including pressures and operating temperatures, and to comply with increasingly onerous health legislation measures.

To meet health criteria on an ongoing basis, all systems, including process equipment and piping, must be fully drainable, cleanable and sterilisable for successful production. The design philosophy for process equipment is that it should allow the product to flow freely and unhampered through the system. It should be possible to clean the system efficiently using CIP (Clean in Place) systems. This implies a free flowing simple fabrication with minimum discontinuities. Crevices, geometric effects such as corners and junctions and welding introduce discontinuities, the latter through the effects of heat, surface roughness, weld filler geometric effects, and the characteristics of the heterogeneous nature of the cast weld nugget. Pipe misalignment also produces discontinuities.

Orbital welding was piloted by the aerospace sector in 1960 as a reliable alternative to manual welding. It involves rotating the arc mechanically through 360° around a pipe, in a continuous process. The fully automated, programmable system consists of a power supply and an orbiting welding head clamped to the pipes. Welding heads are normally enclosed and provide an inert atmosphere



chamber capacity surrounding the weld joint. To achieve the required weld, the welding head rotates an electrode and an electric arc from a tungsten electrode around the joint. Orbital welding is believed to be a more precise and reliable method than the manual welding method.

Orbital welding became more practical from the early 1980's as machines both became portable enough to be taken from place to place for multiple in-place welds and combination power supply/control systems were developed. Control of the welding parameters is pre-programmed through the power supply/control system. Welding parameters for a variety of applications can be stored in memory and called up when needed for a specific application. It has been adopted by many sectors including sterile process plant and heat exchanger applications. Orbital welding equipment provides the ability to make high quality, consistent welds repeatedly at a speed close

to the maximum weld speed. Other benefits include productivity, repeatable quality, consistency, use by less skilled welders and access into difficult areas. Orbital welding is the method of choice for the health related industries where welding is required.

However, problems may arise. Uncorroborated inspection measurement reports suggest a low success on orbital welds applied to heat exchanger tubes on a major local contract. A mathematical algorithm has been developed to check the effect of manufacturing tolerances against an 80% overlap criteria for the physically thinner pipe. This confirmed the significance of and need to control tolerances.

Whilst orbital welding is capable of producing high quality welds, it is very dependent on correct set up. This includes two elements, the pipe as manufactured and the pipe as set up for welding. Choices made regarding input pipe tolerances or post receipt pipe

end modification affects both the degree of overlap achieved and, as a result, the appropriateness of the pre-programmed current/wire feed speed relationship. Both a constant distance between pipes and a constant overlap is required. Incorrect set up poses problems of over fill and proud roots, or under fill and crevices, which would introduce performance problems.

To avoid mismatching welded joints on pipe surfaces where scale or bio-film can develop, it is crucial that pipe selection and pre-welding and welding procedures facilitate orbital welding. Pipe tolerances are a matter that the welder is unable to control. The welder can control pipe orientations, the gap between pipes of below 15% of wall thickness, and angular and centroid

misalignment. The welder can also ensure that pipes are square cut, sharp edged (not cut with a pipe cutter), deburred and thoroughly cleaned shortly before welding.

When executed correctly, orbital welding will realise consistently high quality results which meet hygiene requirements.

UPCOMING EVENTS

2014 Golf Days

The SAIW Golf Competition 2014 will be held at Mowbray Golf Club on the 6th of March 2014. The competition will be a Four-ball Alliance with two scores to count on all holes. The first tee off will be at 12h14.



The cost will be R350.00 per player (R1400.00 per four-ball) excluding VAT, golf carts, caddy fees and drinks but including green fees, halfway house and dinner. The cost per cart will be R250.00 and bookings must be made directly with the golf club on (021) 685 3018. Caddies will be available on the day at a cost of R200.00 per caddie.

VAT) - recommended holes are 1st, 10th, 4th, 13th, 6th, and 15th – and prizes for winners, runners up, third place, most golf played, longest drive and closest to the pin. In fact, any form of prizes would be most welcome. Donations of giveaways will also be welcome. There is also an opportunity to sponsor the prize giving event.

players to attend the dinner only may do so at a cost of R80.00 per head. Bookings can be done with Kim Stevens on 082 855 4070 or by email at stevensk@saiw.co.za.

Sponsorship opportunities include greens/tees at a cost of R400.00 per hole (excluding

Prize giving and dinner will take place at 18h00. Golfers who would like to invite non-

The Johannesburg golf day will be held on the 13th of May 2014 at the Royal Johannesburg Golf Club and the Durban Golf Day will be held on the 24th of July 2014 at the Royal Durban Golf Club.

Pressure Equipment Regulations PER and SANS 347 Workshops

SAIW and Sassda will be hosting a one day workshop on the Pressure Equipment Regulations and the associated SANS 347 standard for categorisation and conformity assessment of all pressure equipment. The workshop is intended to provide a practical overview of recent changes to regulations covering pressure equipment

The first workshop took place on the 4th of February 2014 at Gold Reef City, Ormonde, Johannesburg and the next workshop is

scheduled to take place in Durban on the 20th of May 2014, venue to be confirmed. A workshop will also take place in Cape Town, please look out for further details on the SAIW website.

The director of SAIW, Jim Guild, will be the presenter of the workshop and is approved by the Department of Labour to conduct training on the PER and SANS 347 standard for “Categorisation and conformity assessment criteria for all pressure equipment.”

CPD points are available for Competent Person Inspectors, Inspectors of Pressurised Equipment and Professional Engineering personnel. In addition attendance serves as exemption from re-certification examination for Competent Persons & Inspectors – Pressure Equipment.

The Programme will run as follows:

- Registration - 08h00 to 08h30
 - Session 1: Pressure Equipment Regulations
 - Session 2: Guidance notes to Pressure Equipment Regulations
 - Session 3: SANS 347 - Categorisation and conformity assessment criteria for all pressure equipment
 - Session 4: SANS 3834 - Quality requirements for fusion welding of metallic materials
 - Session 5: ASME VIII Div 1 - Mandatory Appendix 10 Quality Control System
- Seminar Ends - 16h30

The cost of this workshop is R1250.00 (including VAT) for SAIW/Sassda Members and R1600.00 (including VAT) for Non Members. Costs include tea breaks and lunch, together with copies of the PER and SANS 347 standard and guidelines. Drinks and snacks will be sponsored by Sassda to be served after the workshop.

Please contact Kim Stevens on stevensk@saiw.co.za to register your interest, further workshops will be scheduled on demand. For more information, visit www.saiw.co.za.



Westarcor ISO Certified

WESTARCOR ENGINEERING, a private company in operation since August 2000, was recently certified as ISO 3834 Part 2 compliant. Due to Westarcor Engineering servicing an international client base, being ISO 3834 certified became a necessity. It was found that without certification it was not possible to be globally competitive, especially when repairs and fabrication of new pressure vessels was undertaken.

“The process to become certified was not that difficult,” says Ben Venter, QA project manager of Westarcor. “The company was already working to the required ISO 3834 standards. All that needed to be done was to document and implement processes. In fact, nothing has changed in the way we manufacture; we now just have the certification to prove the high quality standards that we adhere to”.

With ISO 3834 and ISO 9001 certification in place, Westarcor can hold its own with any local or international company for tender and



work purposes without first having to have a client audit. Westarcor will also now have international exposure through SAIW listing; a truly South African company, situated in Saldanha, successfully competing with the best in the world.

TULLIO MONTE



“At any job the first impression is the one that lasts, and a good weld always leaves a long lasting impression.”

Tullio Monte has been the chairman of SAIW Kwa-Zulu Natal for the past 13 years. Monte recalls how, in the 70s, he loved attending the monthly meetings that were held at a hotel on the Esplanade at that stage. After a few years Monte become a committee member and it was not long before, under the tutorial of Ralph Sharp, he was nominated for chairman of SAIW KZN. Monte enjoyed sharing the workload with his friends and colleagues, in particular the Vice Chairman, Mark Bouchier. Monte also fulfils the position of Senior Welding Coordinator and Training Officer at ND Eng. (ex Metso ND Eng.). The training position fulfils the passion he has for welding and, in such, uplifting willing apprentices in the welding field.

Monte grew up in Italy where, in the 50s you were lucky to complete basic elementary school (five years). His big break came in South Africa with SANDOCK AUSTRAL where he developed a passion for welding thanks to SAIW. Monte was sent to various seminars and in 1984 he was sent for the Level 1 Welding Supervisor course. In 1987 he completed Level 2. Never stopping his studies, in January 2004 he achieved the International Welding Specialist diploma.

In the SPOTLIGHT

Monte was part of the delegation in 1993 attending the International Young Welder competition in Taiwan. Monte was also the welding supervisor for the manufacturing of the RATEL infantry troop carrier for the South African Defence Force (ARMSCOR). He also supervised the manufacturing of the first two sets of bearing casings for the Kendall Power Station. He was acknowledged for his commitment and service by being awarded Honorary Life Membership from the SAIW in 2003.

Under the leadership of Monte, the SAIW KZN committee strives to have a SAIW approved training centre in KZN. There are also plans afoot to improve the SAIW meetings and attendance records. These objectives will probably be achieved, especially with a leader whose advice to the industry is that if you plan for a year, you should plant rice, but if you plan for ten years, you should plant a tree. Those who plan for success to last 100 years should educate and train their people. Monte advises younger people to focus on creating a positive future at every opportunity and to practice, practice and practice again! “At any job the first impression is the one that lasts, and a good weld always leaves a long lasting impression,” says Monte.

Monte holds that he does not have a comfort zone, if things are quiet he will stir the pot until something comes up and if it does not come up he will make it come up. He was happily married for 43 years, four months and four days when his Marilyn was taken away. The couple have two sons and one daughter. Monte’s eldest son is a welder and boilermaker in Australia and the second son is a mechanical engineer, also in Austria. His daughter is a self-employed graphic designer. Monte considers having raised this wonderful family as his biggest achievement in life and attributes the success of it to his lovely wife.

He attributes his success to appreciation of all that is good, commitment to the task at hand and dedication to the opportunities that he received in his life, always tackling them head on. He also warns never to lull in a comfort zone. “Life is too short to waste like that!” Monte is definitely a very wise man who even gets called on to solve welding problems. When it is solved it brings him huge pleasure. “I am very satisfied with my life,” says Monte, South Africa has been very good to me!”

ECONOMY OF STEEL IMPORTS



By Kobus de Beer (SAISC)

South Africa boasts a robust steel fabrication industry, which produces 720 000 tons of steel per annum and employs more than 110 000 people. The steel industry is an economic multiplier and statistics show that a R1-billion structural steel project (50 000 tons) can potentially initiate economic activity in various areas to the value of R1.43-billion and provide decent jobs for 5 050

people. Such a project will include disciplines such as manufacturing, wholesale and retail, transport and storage, community and social and, of course, financial services.

South Africa should therefore be self-sufficient with regards to steel manufacturing. But much of the structural steel projects use imported steel. During 2012 and 2013, at least 100 000 tons of steel were imported for power station, power line, cement plant, mining, petrochem and iron ore projects, resulting in the loss of 7 650 jobs. This is most alarming, especially in light of South Africa's unemployment rate which, according to Financial Mail, is 25.6%. In addition, the country also loses through the impact of imports on the economic multiplier. The disappointing fact is that no import duties were paid on any of the imported structural steel and only 30% found its way into the SARS Customs statistics that are used by many to understand the South African economic flows and as a base for decision making.

There is a general lack of awareness of the consequences of imports. Reasons for importing include cheaper labour costs in countries such as China and a perceived shortage of skills in the local industry. There is limited on-the-job training for engineers and draughtsmen in South Africa and new technologies bring challenges. There are also vast discrepancies in qualification standards between China and South Africa. Concerns regarding corruption and price fixing in South Africa have also played a part in increased imports and have undermined South Africa's credibility.

There is much the steel industry can do to halt the steady flow of imports. A start would be for the local industry to take a holistic approach to client needs, to be both cost- and service-competitive, and equip staff with the necessary skills to provide good service. The steel industry also needs to be made aware of the disadvantages of imports, such as the displacement of South African jobs, quality of the steelwork, misunderstandings caused by language barriers and the increased costs of quality assurance and rectification. The industry still achieves a growing stream of exports every year which indicates local pricing being reasonably competitive.

The Southern African Institute of Steel Construction (SAISC) is taking action to protect the steel industry from imports by taking an aggressive approach in promoting competitiveness amongst South African steel companies to export, and challenge foreign projects. The Institute is also exposing illegal importing activities to the DTI and SARS, and is applying for the implementation of dumping, designation and duties. It is important to create awareness of the jobs lost due to decisions made to import structural steel requirements. It is hoped that other associations and organisations will join SAISC in protecting the local steel industry.

MEMBER NEWS: New SAISC CEO Appointed



The Southern African Institute of Steel Construction (SAISC) appointed Paolo Trincherio as the new CEO after Dr Hennie de Clercq retired. Trincherio, who matriculated at Greenside High School and has a BSc Eng (Civil) and a MSc Eng from the University of the Witwatersrand has been in the steel industry for almost 25 years after starting his career in 1988 as a structural engineer at Dorbyl.

He took up a position as a lecturer at Wits, after which he joined SAISC in 1998 as consulting development engineer and technology director. In 2003 he took up the position of engineering manager at Macsteel Trading, where he was promoted to group business development and technical director, while still keeping in touch with SAISC and sitting on various committees.

Trincherio is excited about this new position and the challenges it brings. "The Steel Construction industry, like most industries, is facing tough times", says Trincherio. "It is my job to navigate the industry through this market and develop strategies to assist SAISC members to grow their businesses." New strategies will include ensuring market

growth and opening new markets, increasing exports and promotion of the light steel frame industry. Trincherio is also focussing on ensuring that the local steel construction industry gets government business. "There are too many international companies supplying government while we have the expertise and the resources to buy locally", he holds. "It is also necessary to focus on developing the younger generation and enticing them to enter the Steel industry."

Trincherio says that his wife, Lora, is the person who had the biggest influence on his personal life and attributes his professional success to Professor Alan Kemp from the University of the Witwatersrand. His life philosophy is to persevere and never give up. In such he hopes to still finish his PhD.

In his private time he enjoys reading Jeffrey Archer, Jeffrey Deaver and John Irving or surfing the web to read Engineeringnews.co.za and news sites or watching The Big Bang Theory, Nextworld and Brain Games on TV while eating Ravioli. Trincherio also enjoys DIY, hiking, kayaking and spending time with their three children; Giulio, 14, Angelo, 11 and Sabrina, 8 and their two Alsations and four cats.

Trincherio concludes by confirming that he feels like he's come home. "SAISC is a vibrant and effective industrial institute, having done very good work. I hope that I can take the institute to even higher levels and provide excellent results for SAISC and its members. Where there is a will there is a way, no matter how difficult the market".

NEW ISO 9606-1 STANDARD PUBLISHED

After many years the new ISO 9606-1 : Qualification Testing of Welder – Fusion Welding – Steels was published in 2012, superseding the previous standard which was published in 1994. This is good news for the South African welding community. EN 287-1 has been the workhorse standard for European welding codes for many years as the European welding community did not agree on revisions of the ISO 9606 standard during the intervening years. As there was not a mutual recognition agreement between the European Standardisation Organisations and South African National Standards, EN 287-1 could not be adopted as an official South African Standard, leaving a void for standardisation in South Africa.

ISO 9606-1 will supersede EN287-1. This will be an important transition, as the ISO 9606-1 standard is better aligned with competing standards such as the ASME and AWS codes. On perusing ISO 9606-1, it has many similarities to EN 287-1 and is indeed an evolution of this standard which was revised in 2004 and, recently, in 2011. Many of the essential variables remain the same for both standards, namely; welding process, product type, type of weld, dimensions, welding position and weld details. However, a significant change is that welder qualifications are no longer qualified according to material group, but are now qualified by filler material group instead.

Welder qualifications are now based on the filler material group used to weld the test plate. For example, FM1 covers non-alloy and fine grain steel filler materials such as E7018 (ISO 2560/AWS A5.1) and ER 70S-6 (ISO 14341/AWS A5.18). The filler material classification forms the basis for the filler material group. There are also filler metals groupings for high strength steels (FM2), creep resisting steels $Cr < 3.75\%$ (FM3), creep resisting steel $3.75 \leq Cr \leq 12\%$ (FM4), stainless and heat resisting steels (FM5) and nickel and nickel alloys (FM6). The parent material group still needs to be recorded on the welder qualification certificate, but without attributing a range of qualification to it. The filler material type that we are accustomed to from EN 287-1 is retained in the new standard.

With respect to welding processes, there are a number of changes following the update of ISO 4063. This poses a challenge for MIG/MAG welding, a welder who is qualified for short circuit transfer mode is also permitted to weld with other material transfer modes (globular, pulsed and spray arc), but not the other way around. The challenge is to determine in what transfer mode the welder is welding, especially with the advent of modern power sources that periodically change the transfer mode.

As per the 2011 revision of EN 287-1, a fillet weld is no longer qualified by a butt weld test. However, ISO 9606 has a provision for a combined test piece to qualify a fillet weld in combination with a butt weld. In this case a single bevel joint shall be welded with material of a minimum thickness of 10mm with permanent backing. A number of welding positions have disappeared in the new standard. This standard makes active use of the difference between testing positions and the welding position. Testing positions have a tolerance within which the test must be carried out. Welding positions are designated with names such as “flat”, “horizontal” and “overhead” which is in line with ASME IX and AWS welding codes. Tolerances are described in ISO 6947.

In this standard the “stop-start” requirement has changed. The previous standard requires one stop-start in the root and one in the capping-layer. Now when more than one welding process is being used, at least one stop-start must be carried out for each welding process including the root and the capping-layer. Changing from a solid or a metal cored electrode to a flux cored electrode is considered

to be a change in process. In such cases it is recommended to put all stops-starts in one line so that the number of test bars or sections can be limited.

With regards to the acceptance requirements for test pieces, the standard states that the sum of the greatest discontinuities exceeding 1mm but less than 3mm in any one bend specimen shall not exceed 10mm. Another new element can be found in the “incorrect weld toe”. With EN 287, testing can be done on plate or pipe only whereas with ISO 9606 testing can also be done on any “suitable product form”. Any test that fails to comply with the requirements of this standard may only be carried out again once without further training having been given. After failing for a second time, further training must be provided and verified before a new test can be taken.

An important new requirement is that with the first qualification it must already be stated how the extension will be carried out. There are three options to choose from in this respect:

1. Extension can be done through carrying out of a new test every three years.
2. In line with the requirements of EN 287-1, the qualification is revalidated (prolonged) when two welds that have been made during the last six months before the validity of the certificate has expired are assessed by volumetric non-destructive testing.
3. A welder’s qualification can be valid without limitation provided that the validity is confirmed every six months, the welder is working for the same manufacturer and the quality system satisfies the requirements of ISO 3834 Part 2 or Part 3. This last option is similar to the requirements of ASME with the addition of the manufacturer’s quality programme being verified.

In Europe the EN 287-1 standard needs to be withdrawn by October 2015. As EN 287-1 is not an official standard in South Africa, the transition requirement is not very clear, it is therefore recommended that contract requirements between manufacturer and purchaser are adhered to. Certifications from EN 287-1 can be transferred to ISO 9606-1 where the necessary records are available to complete the ISO 9606-1 certificate, for example, the filler metal classification has been recorded and the technical intent of the ISO 9606-1 standard has been fulfilled.

SAIW will be holding evening meetings around the country detailing valuable information on this new standard and the implementation thereof. Be on the lookout for announcements in this regard.

Announcement

The editorial team would like to thank Dr Tony Paterson for contributing the lead article. Content supplied by Dr Paterson is always relevant and educational.

Members are reminded that Fusion is a newsletter to communicate SAIW and Industry news. Members are therefore welcome to submit any relevant information and news for publication to frances@trinitas.co.za



2013 Social Calendar



SAIW has become known for their wonderful social and networking events. 2013 was no exception. Three successful golf days were held in Johannesburg, Cape Town and Durban. Damian Kotecki presented a series of seminars around the country on the Welding Metallurgy of Stainless Steel and Jim Guild presented a series of seminars on the PER and SANS 347. The Young Welder competition culminated in an awards ceremony on the 28 of January and on the 8th of March a prestigious graduation ceremony was held at Goldreef City Casino Hotel where SAIW President, Professor Madeleine du Toit, welcomed guests and congratulated graduates.

On the 19th of July 2013 the new testing laboratory was opened. Mr Sean Blake commented that the laboratory is long overdue and that it is only through hard work and help from the sponsors that it could eventually have been launched. There are various Material Testing Services that will be rendered, such as mechanical testing, failure analysis, research and development, welding consumable evaluation, weld procedure qualification, welder qualification, post weld heat treatment and positive material identification.

The SAIW Annual Dinner was another huge success with comedian Mark Lottering acting as MC. The food was delicious, and the Nubia group entertained the audience with cover songs from, amongst others, the Carpenters. The highlight of the evening was when Mr Johan Pieterse from Afrox, and a councillor of SAIW, assisted by Prof Madeleine du Toit in presenting the annual awards.

The year ended with another certification evening on the 4th of October 2013. Guests were entertained by Karlien and Donovan before one hundred and twelve flagship qualifications were presented in two categories. The first category was the IIW International Welding Specialist diplomas which form part of the category of welding coordinators. The welding coordinator diplomas are the modern version of welding supervisor qualifications. The second group of awardees was the inspection qualifications. These qualifications have been around for more than a quarter of a century. They are part and parcel of industry requirements for personnel in the welding field.

SAIW looks forward to many more enjoyable functions during 2014. Please see upcoming events for the first announcements.

Appreciation of Welding for Engineers

On every project, repair or modification involving welded fabrications, there are three key players: the engineer, the welder and the inspector. The engineer carries primary responsibility and is expected to manage welding operations. Welding is not built into the curriculum of any engineering degree, and therefore, this is the ideal course for any maintenance engineer, project engineer, workshop manager, designer, draughtsmen or quality manager that has a tertiary engineering qualification to attend. Candidates without an engineering qualification, but with at least two years' experience level, can also apply.

Appreciation of welding for engineers is a five-day course and covers welding processes and consumables, including; the selection and application of common welding processes, classification and choice of consumables and advanced processes, welding defects and the causes of defects arising in weld joints and common failure methods, materials technology such as the behaviour of carbon steels and stainless steels during welding, visual inspection in order to identify defects arising in welding operations, distortion and control of dimensions to determine factors causing distortion and how to avoid distortion, the use of jigs and other equipment and welding procedures and their control. Students will learn what a welding procedure specification is and what a procedure qualification record is.

Further insights the course will bring about is how to design against failure and how joint design can be significant in failures, quality assurance in welding operations and the importance of quality systems including ISO 3834. The theory of Non-destructive testing methods and the advantages and disadvantages of the common test methods will also be covered. The maintenance and repair of hard-facing and metal spraying as well as the interpretation of welding symbols in international standards and their application in fabrication drawings is also covered in the course. On completion of the course candidates will have a good appreciation of the basics of welding technology to ensure that maintenance, fabrication and construction work is being carried out effectively in terms of quality and cost-



effectiveness and understand the importance of ensuring welding operations being carried out using approved welding procedures and suitably code certified welders.

The schedule for 2014 is depicted in the table below:

Johannesburg	Durban	Cape Town
Group 1	Group 1	Group 1
10 – 14 February	5 – 9 May	9 – 13 June
Group 2	Group 2	Group 2
7 – 11 April	13 – 17 October	20 – 24 October
Group 3		
1 – 5 September		
Group 4		
3 – 7 November		

For more information or to enrol for this course, please contact Rebecca Motloug at SAIW on 011 298 2100 or on e-mail at admin@saiw.co.za.

Appreciation of NDT for Engineers

With growing industrial demand, increasing operational parameters, extension of in service maintenance schedules and designed operating life expectancy, use of new materials and new equipment available, engineers are finding it increasingly difficult to maintain operational capability while still containing fabrication and maintenance costs, due to their lack of knowledge of welding technology and related applied sciences such as non-destructive testing.

As the term suggests, non-destructive testing (NDT) includes a wide group of testing techniques used in industry to assess the properties of a material and to identify discontinuities within components or systems, without causing damage or inhibiting operation. Because NDT does not permanently alter the article being inspected, it is a highly valuable testing technique that can save both money and time in product research, design, manufacture, quality assessment, operational evaluation and maintenance.

Industrial sectors such as power generation, petrochemical, mining, aviation, transport, sugar and pulp, utilise NDT extensively to provide sufficient information as to facilitate sound engineering decisions and practices. Common NDT methods include ultrasonic, magnetic, penetrant, radiographic, visual and eddy-current testing.

The “Appreciation of NDT for Engineers” course aims at providing personnel involved in the design, manufacture, fabrication, installation, operation and maintenance of engineering components, managers and supervisors responsible for plant operation and product delivery, as well as engineers and engineers in training, with a basic understanding of the various NDT methods and when and how they are applied within the manufacture, fabrication, operation and maintenance phases of industrial plants or components.

SAIW is presenting this course on a public basis in all the major centres throughout the year and may also be “in house” at your company, depending on the amount of candidates and the availability of resources.

The schedule of courses is depicted in the table below:

Group 1	Group 2	Group 3
JHB	CPT	Durban
7 - 11 April	14 – 17 April	22 – 25 April

Welding of copper and its alloys

Brasses & Bronzes - Part 2

By Gene Mathers

The main alloying element in the brasses is zinc (Zn). There are three families; brass with zinc content less than 20%, high zinc alloys with 30-45% zinc and the nickel-silvers that contain 20-45% zinc and 20% nickel. These alloys are available as wrought or cast products, the low Zn alloys being used generally for jewellery and coins, the higher Zn alloys in applications where increased mechanical strength is required such as plumbing products, pump casings and thin wall low pressure vessels. Nickel silver, as the name suggests, is a less expensive alternative to silver (Ag) and is used for jewellery, coinage and cutlery. On an historical note, the panels of the 1907 Rolls Royce Silver Ghost are made from nickel silver, hence the name.

With the exception of brasses containing lead (Pb) all the brasses are weldable, the low zinc alloys being the easiest. The main problem with welding the alloys is weld metal porosity caused by the zinc boiling off during melting. Zinc melts at 420°C and boils at 910°C so brazing using an oxy-acetylene torch and a copper-silver filler is a possible alternative to welding, being capable of providing joints with adequate mechanical properties and without the porosity problems. Boiling the zinc may also result in large amounts of zinc oxide in the welding fume and this can be a health and safety issue. Brasses may be welded using MMA, MIG or TIG. Filler metals are available although these are generally based on copper-silicon or copper-tin alloys due to the problems of transferring zinc across the welding arc. A typical MIG/TIG filler metal would be the 3% silicon alloy specified in EN ISO 24373 SCu 6560 (CuSi3Mn1). Successful welds can also be made using copper-tin alloys such as Cu-7%Sn and Cu-12%Sn. These can be obtained as both MIG/TIG wires and as MMA electrodes.

The Cu-Si filler metal flows easily and a 60° included angle weld preparation should give acceptable results. The Cu-Sn weld metal is more sluggish and an included angle of at least 70° is advisable. The shielding gas used for MIG or TIG welding of thin section components is high purity argon. In thicker sections, over 5mm thick, the addition

of helium will greatly assist in providing sufficient heat for full fusion as will the use of pulsed welding current. Brass, like copper, has a high coefficient of thermal conductivity. TIG welding is generally limited to joint thickness of around 10mm, MIG being the preferred process for thicker sections. Preheating to between 100 and 300°C, depending upon section thickness can be helpful in reducing zinc loss, particularly in the high zinc alloys, by enabling a lower welding current to be used, resulting in less melting of the parent metal.

There is a potential problem in service of stress corrosion, known as season cracking, in mildly corrosive media such as ammonia or sea water due to the residual stresses from welding. This can be largely dealt with by annealing the welded item at 260-300°C.

The next group of alloys is the bronzes. These may be alloyed with tin, generally described as phosphor bronze, silicon or aluminium. Many of these alloys, like the brasses, are alloyed with lead to improve machinability. These leaded alloys are generally regarded as unweldable and specialist advice should be sought if the need arises.

Phosphor bronze alloys contain between 1 and 12% tin with a small amount (0.01-0.1%) of phosphorus (P) when this is used solely as a deoxidising agent. True phosphor-bronzes contain at least 0.1%P and as much as 1.0%P in some of the cast phosphor bronzes.

The alloys are corrosion resistant and have excellent wear characteristics so they are used for valves, bearings and machine parts. From a weldability point of view the main problem is that the alloys are sensitive to hot cracking and the lower P content alloys are also prone to form oxide films on the weld pool. High welding heat inputs, high preheat and slow cooling rates should therefore be avoided. MIG and TIG welding are the preferred welding processes with argon or helium-argon mixtures. MIG is more suitable than TIG for welding heavier section joints and positional welding is best achieved using pulsed current. Filler metals matching the composition of the parent metal, e.g. EN ISO 24373 CuSn6P, are available. Although MMA welding consumables are available the process is not widely used. A stringer bead welding technique is generally necessary and heavy sections require preheat and interpass temperatures of around 200°C.

Silicon bronzes are probably the easiest of all the bronzes to weld. They contain between 1.0 and 4.0% silicon with small amounts, less than 1.5% in total, of zinc, manganese and/or iron. They have good strength and excellent corrosion resistant properties and are frequently used for heat exchanger tubing, marine hardware and in chemical process plant applications.

Unlike many of the other copper alloys, thermal conductivity is relatively low and this makes it possible to use high welding speeds and to dispense with preheat for the thicker



joints. One undesirable characteristic, however, is that the silicon tends to form an oxide film on the weld pool surface that requires vigorous wire brushing of individual weld passes during multi-run welding. There is also a slight tendency to hot shortness at elevated temperatures. It is advisable to stress relieve or anneal components prior to welding and to cool rapidly through the 1000-850°C temperature range.

As with the other bronzes, MIG or TIG welding are the processes of choice using pure argon as the shield gas and consumables that match the parent metal composition, e.g. EN ISO 24373 CuSi3Mn1. Low thermal conductivity means that helium mixes are not necessary and the TIG process can be used for welding components up to 25mm thickness at welding currents of 300amps. However, it should be noted that the weld pool size should be restricted to provide a fast cooling rate.

The last alloy in this series is aluminium-bronze. This family of alloys has compositions between 3 and 15% of aluminium with additions of iron, manganese and nickel. The alloys with less than 8%Al are single phase, while those with more than 9%Al are two phase and capable of being quench hardened to give a martensitic micro-structure. All the alloys have excellent corrosion resistance, particularly in marine environments, and are used for pump bodies, valves, bearings and ships propellers.

The characteristic that gives the alloy its corrosion resistance is the strong tenacious aluminium oxide film that forms on the surface. This causes problems of oxide film entrapment and lack of fusion during welding and must be removed. Scraping and wire brushing the surfaces before welding is necessary. With respect to the welding processes, IG and TIG are preferred. With MIG there is no problem in dispersing the oxide film, the DC+ve current breaking up and dispersing the film. DC-ve TIG welding does not provide this cleaning action and it is necessary to use AC-TIG. Inverter-based square

wave TIG power sources will give the best control. Argon is the recommended shield gas although a helium/argon mixture may be useful when welding very thick section joints with the MIG process. MMA welding is possible although the fluxes required to remove the oxide film are very aggressive and may cause corrosion problems if not completely removed before the item enters service.

Aluminium bronzes with less than 8% aluminium are prone to hot cracking at temperatures around 700°C and care needs to be taken to reduce residual stresses as much as possible by ensuring accurate fit-up and minimal root gaps. Low heat input procedures should be used and interpass temperature limited to 150°C. These alloys do not require preheat. A filler metal with around 8 to 10% aluminium such as EN ISO 24373 CuAl10Fe1 or AWS A5.7 CuAl-A2 is the best choice as this composition is relatively resistant to hot cracking.

The two phase alloys, i.e. those with more than approximately 9%Al, have very high tensile strengths although the very highly alloyed suffer from a substantial loss of ductility. All the alloys are, however, readily weldable and relatively insensitive to hot cracking. Heat input control is therefore less important although a maximum interpass temperature of 250°C is recommended and a preheat of 150°C may be used when MIG welding thick section joints. AWS A5.7 ER CuAl-A2 (EN ISO 24373 CuAl10Fe1) or, for higher strength, ER CuAl-A3 (EN ISO 24373 CuAl11Fe3) are readily available MIG/TIG filler metals.

Post weld heat treatment is rarely necessary but can be of benefit if the welded item is to experience very corrosive conditions. In this case a stress relief operation at 300-350°C may be beneficial, although precise temperatures and times will depend upon the specific alloy composition, thickness, etc. It is possible for the high aluminium duplex alloys to be quenched from 950°C and tempered at 650°C to restore full corrosion resistance but this is rarely done due to cost and distortion issues.



SAIW
Southern African Institute of Welding

SAIW Metallurgical Testing Laboratory available to fulfil testing, consulting and qualification needs

Services available with the use of state of the art equipment include:

- Tensile testing
- Impact testing
- Hardness testing
- Chemical analysis
- Diffusible hydrogen
- Failure analysis
- Weld procedure qualification
- Welder qualification

Contact Sean Blake at blakes@saiw.co.za or on 011 298 2100 for further information

Sean Blake

Mr Sean Blake, formerly technical services manager of SAIW, has been promoted to general manager; operations. Blake has been at the institute for five years and is committed to making SAIW even more relevant to its members. "Under the leadership of Jim Guild, the Institute is well placed to serve the requirements of the industry," says Blake. "We hope to continue to produce well trained individuals of high quality while delivering good service to members. In order to deliver, SAIW will continue engaging with industry and the relevant players".

Life for Blake has become very busy, looking after all of the operational functions at SAIW, including training, practical welding, NDT, qualification and certification, his mission being to align operations with the strategic objectives of the organisation and maintain an industry wide focus. While the Institute is growing at a tremendous rate, it is primarily driven by the power generation and petrochemical industries. It is an objective of the Institute to open up new markets and to contribute towards the eradication of the chronic skills shortage the welding industry is experiencing.

"Creating skills and entering new markets is what has to happen in order to create sustainable growth," holds Blake.

Blake is happily married and together the couple has two children. He holds a B.Sc (Eng), Metallurgy and Materials Engineering from the University of Witwatersrand. Before joining SAIW, Blake was technical manager at Amalgamated Welding and Cutting (a subsidiary of Afrox), where he was responsible for manufacture of SMAW welding consumables and sales support of all the companies products. Blake had a number of roles within Afrox including Product Manager: CO2 and H2 and Controlled Atmospheres Manager, he spent a total of 14 years in the employ of Afrox.



Michelle Warmback

Michelle Warmback joined SAIW five years ago as head of accounts. She has now been promoted to finance and admin manager. Her new role will include training admin, corporate governance and the administration of examinations, certifications and course schedules. Warmback will also manage the marketing of the organisation.

"I am proud and thankful for what I could achieve," says Warmback. "It is an exciting opportunity and I look forward to the challenge". Warmback's mission at SAIW is to make the customer experience as user friendly as possible. She has also set about streamlining the processes in order to make the organisation more efficient and effective.

Warmback believes that just generally being a nice person while working hard and showing commitment to the job at hand and the

organisation you work for is what gets you the promotion. "It is important, however, not to put your professional life ahead of that of your family. I love spending time with my family at our holiday home in Plettenberg Bay and just having fun," says Warmback, who is married and has two children, a daughter and a son. While she is getting ready to cope with empty nest syndrome, she has enough to keep her busy at SAIW.



NEW APPOINTMENTS

Musa Manganye

Musa Manganye was born in a small village called Xitlhelani village in Limpopo, close to Malamulele, a town 35 kilometres away from the Punda Maria gate of the Kruger National Park, Malamulele borders the Kruger National Park and is 243 km's away from Polokwane. Manganye moved to Gauteng to study and first attended the University of Pretoria. He then moved to the Vaal University of Technology to study metallurgical engineering. Manganye is now doing his practical training at SAIW as an assistant in the SAIW Testing Laboratory.

Manganye dreams of being permanently appointed at SAIW, but failing that he will continue his studies to achieve his BTech degree. His ultimate goal is to become a registered professional engineer. He does not want to be called a Technologist for long. Manganye is thankful to his lecturer who was working with SAIW and told him about the opportunity to do his practical training at SAIW. He sent his CV, got interviewed and was offered the internship. "I just love working at SAIW and appreciate the opportunity to apply everything I have learnt at university," says Manganye.

In his free time Manganye loves surfing the net finding news to read, but he also likes sports and computer games. He is the fifth child in a family of six children. He feels that growing up in a big family with two brothers and three sisters equipped him well for life. He finds it easy to fit in with any group. Sad for the girls, this handsome young man has a serious girlfriend, who wants to register for a Masters in Biomedical Technology at WITS University. He plans to get married as soon as he is financially stable.

Manganye's parents still live in Limpopo. His dad, a retired teacher is now an entrepreneur, while his mom is still teaching; obviously an academic family from rural South Africa where values and family still matters.



Fiona Weimers

Fiona Weimers recently joined SAIW in the finance department. Weimers is highly experienced in finance and has qualifications in VIP Payroll, creditors, debtors, general bookkeeping and office administration. She was part of the financial team seconded to One World Hospitality that provided staffing and catering for the 2010 World cup. "Moving to SAIW is the best decision I could have made," says Weimers.

Weimers is set upon the idea of making a positive contribution towards the success of SAIW, but also wants to achieve a work-life-balance and have job satisfaction. Weimers was born in Marabastad, Pretoria but grew up in Bosmont, Johannesburg. She is married and has three children, a daughter

of 28 who is married and works as a financial advisor for Wesbank and twin boys of 23 studying Honours in BCom finance and BCom marketing at the University of Johannesburg.

Weimers' philosophy in life is to be happy and live every day as if it were her last. She enjoys a glass of red wine while spending quality time with her family, especially her two grandchildren.



Absalom Chiswo

Absalom Chiswo has a long-standing relationship with SAIW, having done his studies through SAIW since 1984. It was always his dream to work for the Institute. Absalom worked at Spectra Inspection Services, as NDT level 3 inspector prior to joining SAIW. He also studied metallurgy at Manchester Polytechnic on a British scholarship and achieved a Sciences diploma and then a Higher Diploma in Metallurgy. Chiswo joined SAIW in 2014 and is delighted finally to be working at the Institute. He says it is a dream come true and the reality is living up to the dream.

Chiswo is married and he has three children; a psychologist in UK, a student at North West University studying mass communication and the youngest is joining SABC this year to do a diploma in sound engineering. Chiswo enjoys his garden and relaxing at home. He also loves reading. He plans to continue his studies while at SAIW and to get every possible SAIW course under his belt. He is most thankful for the opportunity to help

young people to achieve success and change their quality of life.

Having grown up in Zambia, Chiswo also lived in Malawi, Zimbabwe and the UK. He says one thing he learnt as such a global citizen is that it is about continuous learning. His advice to students is to have professional integrity. "Don't come to SAIW with a notion that getting the certificate is just about earning money. Welding and what it achieves for the world has to become a passion, what you live, breathe and dream about". Chiswo's philosophy in life is that if you work hard, you will always do well.



Jean Scholtz

Jean Scholtz joined SAIW in 2013. Jean has been appointed as assistant to Michelle Warmback, the finance and admin manager at SAIW. Jean loves working at SAIW and especially with Warmback. She believes that hard work is what will make the difference in your career and if you are diligent and conscientious, career opportunities will present themselves.

Scholtz grew up in Johannesburg. She is a person that believes in humility and being available to others to assist and serve. She is married and has five children. Her daughter followed in her mother's footsteps and is work-

ing in finance and the other daughter is a PA at Internet Solutions. Scholtz's one son is in marketing and another in the motor industry. The youngest is in facilities management. Although not looking old enough to have married children, Scholtz is the proud grandmother of six.



OTHER HR NEWS

Thulani Mngomezulu becomes a father

SAIW wishes to congratulate Thulani, a welding consultant at SAIW, and Ndo Dlakadla on the birth of their first child. Busisiwe Tessa Mngomezulu was born on the 25th of September 2013. Thulani joined SAIW in March 2011 just before they got married in December 2011. Ndo is a performing musician (vocalist). Her genre is jazz and gospel music. She is now happy to be wife to Thulani and mom to Tessa.

Qualification and Certification

CONGRATULATIONS TO THE PEOPLE BELOW WHO RECENTLY ACHIEVED QUALIFICATION AND CERTIFICATION

SAQCC-NDT CERTIFICATES

Liquid Penetrant Testing Level 1

A Mosuma
T Jozi
NE Mthombeni
R Viviers
B Jansen van Vuuren
LDS Botes
L Eljay
N Memela
PP Gautier
J Mouton
H Smit

Liquid Penetrant Testing Level 2

O Hussin
M Smit
R Pretorius
JP van der Westhuizen
M Ismail
FJ Cloete

Liquid Penetrant Testing Level 3

SAS Alawad

Magnetic Particle Testing Level 1

A Bhikoo
A Mosuma
T Jozi
BE Mashaba
ST Mthimkulu
WT Mahlangu
DK Mota
C Stenger
DN Reddy
J Digby
GW Mathebula
GCM Coetzee
B Mashile
KG Matlou

Magnetic Particle Testing Level 2

O Hussin
T Tshongwe
MP Mptloung
J Wessels
M Smit
W Joubert
SF Mapiite
G Mhlanga
M Ismail
LJ Mahamba

Magnetic Particle Testing Level 3

None

Ultrasonic Testing Level 1

BS Maremela
CJ Smit
W Joubert
DM Jordaan

Ultrasonic Testing Level 2

J Petersen
O Hussin
M Padayachee
G van der Westhuizen
G Hughes

Ultrasonic Testing Level 3

None

Ultrasonic Testing Wall Thickness

SJ de Beer
WS Sifunda
A Mnisi
KD Jiyane
NF Kekana
NE Mokwena
AG Davel
NG Masalela
J Janse van Rensburg
ASB Naude

Radiographic Testing Level 1

GL van der Spuy
NR Langenhoven

Radiographic Testing Level 2

O Hussin
JH Louw

Radiographic Testing Level 3

None

Radiographic Interpreters

RM Radebe
M van Niekerk
W Joubert
T Smith
R Johns

STUDENTS THAT PASSED THE WELDING INSPECTORS LEVEL ONE & TWO

Welding Inspectors Level 1

M van Niekerk
KD Mathephe
KMM Molepo
N Breet
KJ Botha
PM Dhlamini
BR Sikhosana
CR Stuart
MI Maddocks
EB Forbay
Q Ramdin
M Doba
WIC Kakora
HEM do Santos
TM Mbundani
LC Lynch
S Venkadoray
NR Redman
ED Walters
WB Tarentaal
R Abrahams
MC Ramsay
DJ Firmin
JT Bunning
V Reddy
RN Joseph
AA Jansen
K Sanders
LW Ramagaga
JAJC Daffue
WN Alexs
MJ Dadford
A van der Nest
JT Mashinini
AS Motinga
DE Pugin
SI Khan
MS Ndabezitha
TW Masilela
TJ Fassom
CC Crocker
J Swartz
F Malivhoho
DC Archibald
TW Mazomba
BK Randall
JP Marques
GS Mabena
RC van Schalkwyk
CEJ van Schalkwyk
F Miguel
LT Ndiyibithi
A Musiyiwa
JW Swaepoel

HC Griesel
VG Shabangu
SB Nkosi
PP Serame
MJ Semosa
ZH Nkomo
NN ndlovu
K Moodley
KE Moqhlosane
MP mothacwi
AQ Houston
GM Gulube
EDMD Gielink
DJ de Freitas
R Mouton
MS Tsotetsi
SJ Venter
N Letsaba
E Isaacs
R Hickman
B Boshoff

Welding Inspectors Level 2

D Vermaak
ME Mashinini
JT Viljoen
GL Henry
KJ Morifi
DS Jackson
HM du Plessis
LQ Mthimunya
PR Botha
TW Van der Merwe
CA Kruger
J Bosch
N Buckle
WO Lima
LW Thompson
PD Morton
JF Croucamp
AC Rheeder
NH Rheeder
SP Sambo
DM Thasary
IF Engelbrecht
TA Sheasby
HC Janse van Rensburg
P Mokone
P Steenberg
F Buys
R de Kock
T Mupombwa
ML Thabethe
B Maseko
V Noah
J Kitching
DS Rautenbach
B Khoza
ME Mofokeng
NA Mohlokoane

RC van Eck
JD Engelbrecht
V Vernard
SM Mtimkulu
J van Niekerk
SP Sibiya
R Dunn

ASME Codes of Manufacture

M Kajee
EM Segone
R Goolam
J Botha
C King
JJ Steyn
V Pillay
J Botha
AT Chikwanha
A Diop
M Lloyd
DA Gouws
R Dhanooklal

Painting Inspectors

T E Hlaoli

CERTIFIED STUDENTS

Boilers

J Mbhele
J Jacobs

Pressure Vessels

J Arends

IPE

EP Beukes
A Maluleka
A Mare
BP Radebe
J Lloyd
PI Skosana
K Kleynhans
JCC Roux
Q Prinsloo

Competent Persons Training Course

Wondering how to advance your career as an inspector? The SAIW Competent Persons courses are ideal for persons intending to work as inspectors for an Approved Inspection Authority (AIA) which has in-service inspection included in the scope of its accreditation and approval by the Department of Labour (DOL). These courses are also suitable for engineering personnel responsible for in-service inspection requirements according to the Pressure Equipment Regulations (PER). The qualification will ensure that the user's responsibility in terms of the in-service inspection requirements of the PER are appropriately managed.

In-Service competent persons perform the in-service inspections which are required by the PER according to the Occupational Health and Safety Act. Competent persons are required to be certified by the SAQCC CP certification body and successfully completing an approved training course is an essential requirement for certification.

Certification is available in two categories - pressure vessels or steam generators. In the case of pressure vessels, there are two basic sub-categories; limited or unlimited. Limited certification is aimed at those personnel working only in the field of inspection of compressor air receivers or small medical (or other type) autoclaves. Other pressure vessel inspectors working in the industry, including refinery and process industries or power generation industries, are required to have unlimited certification. In the case of steam generators, certification may be in the sub-categories fired or unfired, depending on the practical experience of the candidate. Certification in the fired sub-category includes certification in unfired equipment whereas the reverse is not applicable.

It is recommended that candidates should have a minimum of Grade 10 or an equivalent qualification and some relevant experience in inspection or operation of pressurised equipment, but all candidates will be considered.

The course runs over 40 days in 4 stages; foundation week, Core week pressure vessels, Process plant modules and Core weeks for steam generators. The curriculum for the foundation week includes common welding processes, their application and the defects arising and common non-destructive testing methods, their application, advantages and disadvantages. The core week on pressure vessels covers the background to legislation, pressure equipment regulations, codes and standards, safety procedures and vessel entry, autoclaves, external and

internal inspections, failures and repairs, including specific equipment and service conditions, overpressure protection devices, pressure testing and report writing. After the foundation week and core week, successful candidates will have a basic knowledge of common welding processes used in pressure vessel manufacture and repair and the defects that may occur in original manufacture.

Candidates will also have gained knowledge and understanding of the defects that arise in service and possible equipment failure mechanisms as well as of the suitability of NDT test methods. They will understand the roles and responsibilities of the USER, the AIA in-Service and the competent person inspector in complying with the in-service inspection requirements of the PER and have sufficient technical knowledge to be able to perform in-service inspection of pressure vessels.

The four-week pressure vessel process plant modules include topics such as plant equipment knowledge, drawing and design and inspection of pressure vessels. It also includes tank inspection, failure mechanisms and risk based inspection. In week three students cover fitness for service, inspection practices for piping systems, material verification and welding of pipelines. Inspection, repair, alteration, rerating in-service piping systems, pipe flanges and flanged fittings are also covered. During week four ASME V NDT, advanced NDT, hardness

testing and report writing is handled. Each module includes practical exercises.

With regards to steam generators the background to legislation, pressure equipment regulations, codes and standards, types of steam generators, knowledge of operation, safety prior, during and after inspections, external and internal inspections, failures and repairs, including specific equipment and service conditions, water treatments, fire side inspection, overpressure protection devices, appreciation of NDT methods, pressure testing and report writing requirements are taught. The course includes an information and discussion forum for the inspection and testing of steam generators.

Successful candidates will have a basic knowledge of common welding processes used in steam generator manufacture and repair and the defects that may occur in original manufacture as well as gain knowledge and understanding of the defects that arise in service and possible equipment failure mechanisms. They will also have gained knowledge of the suitability of NDT test methods and understand the roles and responsibilities of the USER, the AIA in-service and the competent person inspector in complying with the in-service inspection requirements of the PER. When completing this course students will definitely have sufficient technical knowledge to be able to perform in-service inspection of steam generators.

During 2014 Competent Person courses will run as follows -

Competent Persons Foundation Course:

	Group 1	Group 2	Group 3	Group 4	Group 5
JHB	27 - 31 Jan	24 - 28 Mar	02 - 06 Jun	13 - 17 Oct	01 - 05 Dec
DURBAN	31 Apr - 4 May				
CPT	1 - 5 Sep				

Competent Persons Pressure Vessels:

	Group 1	Group 2	Group 3	Group 4
JHB	24 - 28 Mar	9 - 13 Jun	28 Jul - 1 Aug	3 - 7 Nov
DURBAN	26 - 30 May			
CPT	24 - 28 Nov			

Competent Persons Steam Generators:

	Group 1	Group 2	Group 3	Group 4
JHB	24 Feb - 07 Mar	12 - 23 May	25 Aug - 5 Sep	10 - 21 Nov
DURBAN	21 July - 1 Aug			
CPT	20 - 31 Oct			

For more information or to enrol for the Competent Persons course, please contact Lillian Pinat SAIW on 011 298 2100 or e-mail at pinl@saiw.co.za.

Cape Town

The first Welding Inspector (Level1) course in Cape Town commenced on the 20th January 2014. SAIW Cape Town looks forward to training many more students on the various courses for 2014. The objective for 2014 is to grow the region through more evening meetings, a growing database and various seminars and functions.



The Annual Cape Town Golf Day will be held on Thursday, the 6th of March 2014 at the Mowbray Golf Club. This is a fun-filled networking opportunity for all serious (and not-so-serious) players. SAIW Cape Town looks forward to seeing you there. For further information, please contact Liz Berry (berryl@saiw.co.za) or Kim Stevens (stevensk@saiw.co.za).

Congratulations to Westarcor in Saldanha on becoming the first West Coast based company to receive ISO 3834 certification. They received certification for both their main workshop and their site at Arcelor-Mittal (Saldanha), and we wish them every success!

Should there be any suggestions for evening meetings, for further information on forthcoming events or to be added to the Cape Town SAIW mailing list, please contact Liz Berry (berryl@saiw.co.za).

JOHANNESBURG (HEAD OFFICE)
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Johannesburg

On the 20th of November 2013, George Walker (lecturer at SAIW) presented the evening meeting entitled "ISO 2335 and AWS A2.4:93 – Comparison of Welding Symbols". He explained that there is a need for better understanding in the content of ISO 2335 and AWS A2.4:93 as well as explaining the difference between these two standards.

The following was also addressed:

- Why the need for welding symbols?
- The main features of ISO 2335
- The main features of AWS A2.4

New Corporate Members
MEI Construction & Services CC
Pekan Phakamani Engineering Services

New Members
Mouanda VS

Durban



The Durban AGM was held on the 30th of January 2013 at the Westville Country Club in Durban, where the regional committee was elected and Tullio Monte was re-elected as chairman of SAIW KZN. Jim Guild delivered the annual report and discussed the plans for the regional expansion. He also announced

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that Durban will soon have its own SAIW premises. Guild thanked Monte for standing as chairman and for the good work done in the past. Other committee members are David van der Merwe of Elgin, Marc Bouchier of Pieter M Duys (Pty) Ltd, Clive Phillpotts of SASSDA, Kresan Sabapathy of Hi-tech Engineering and Ann Meyer (KZN SAIW Representative).

The KZN branch is going from strength to strength with more people attending every monthly meeting. The attendance at the AGM is proof of the stability and health of the organisation. Further testimony of the success in the region is the first two Welding Inspection courses that are already fully booked for 2014.

MORE TRAINING FOR DURBAN

Due to popular demand, additional courses have been added to the Durban schedule.

From the 31st of March 2014 to the 4th of April 2014 a Competent Persons: Foundation course will be presented. From the 26th until the 30th of May 2014 a Competent Persons, Pressure Vessels Core Week course will also be held. A Competent Persons: Steam Generators – Core Week course will be presented from the 21st of July until the 1st of August 2014.

For more information or to enroll for these courses, please contact Ann Meyer on meyera@saiw.co.za, alternatively contact Lillian Pin at head office on 011 298 2100 or e-mail at pinl@saiw.co.za.

DURBAN
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Chairman: Tullio Monté
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