

JUNE 2024 Volume 67 Issue 5. Online: www.corrosion.com.au

From Mark Sigley, Chair, NZ Electrolysis Committee

The ACA have a great selection of courses available in New Zealand this year – see page 9. Among these are the AMPP (NACE) Cathodic Protection Level 1 Tester and Level 2 Technician courses being run in Auckland, on 14-18 and 21-25 October.

Cathodic Protection Tester (CP1) Certification

The CP 1 – Cathodic Protection Tester course provides both theoretical knowledge and practical techniques for testing and evaluating data to determine the effectiveness of both galvanic and impressed current CP systems and to gather design data.

www.ampp.org

Cathodic Protection Technician (CP2) Certification

The CP 2 – Cathodic Protection Technician course provides intermediate-level training in both theoretical knowledge and practical techniques for testing and evaluating data to determine the effectiveness of both galvanic and impressed current CP systems and to gather design data.

www.ampp.org

The courses teach the most important testing and data gathering techniques, as well as an understanding of the basic science and engineering behind how cathodic protection controls corrosion on metal structures. The courses include lectures, practical demonstrations and hands on training using CP testing and equipment, providing a deep understanding of how CP is applied, and how to test and manage it in the real world.



The courses are highly recommended to anyone embarking on a career in cathodic protection or a related corrosion prevention field.

ACANZ would like to gratefully acknowledge this month's sponsor...

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**Q
&
A
CORNER**



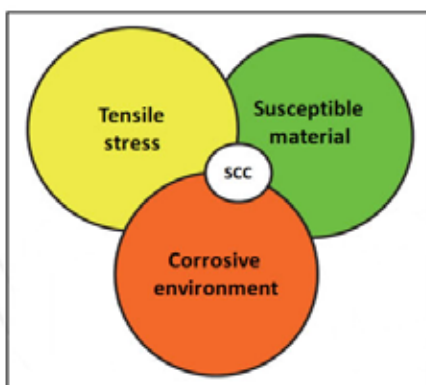
Older ACA NZ members have probably seen a number of situations that may never have made it to a textbook.

If you have a question you'd like clarification on, email it to the Editor at lesboultonrust@gmail.com. We'll pose it to our panel of experts who will answer it in another Bulletin, so everyone can improve their knowledge.

Q:
What is the relationship between stress and corrosion?

& A:

Corrosion is mostly associated with air and moisture; however in some cases the stresses (residual stress or applied stress) acting on a certain material can play a major role in a type of corrosion known as stress corrosion cracking (SCC). Stress corrosion cracking is the cracking of a material (mostly metals) due to the combined action of corrosion and tensile stress. SCC is known for its deceptive nature because the corrosion damage is not always obvious from visual examination. While little metal loss occurs during SCC, the mechanical strength of the material is significantly reduced and this can result in sudden failure, usually in ductile metals.



Conditions necessary for SCC occur.

The mechanisms and the rate of SCC occurring in metals have been well researched over the years. Quite specific conditions must exist for SCC to occur. Some common metal-environment combinations are known to initiate and sustain SCC in various engineering alloys. Also, not all stresses will cause SCC and failure; a minimum threshold tensile stress

value called the stress concentration must exist to cause failure.

The key to controlling or preventing SCC is to understand why certain metals corrode from this stress-related phenomenon. The first line of defence against SCC is proper materials selection. By choosing metals and alloys that are not susceptible to SCC in their operating environment, future stress-related corrosion problems can be avoided.

Since stress is needed to initiate SCC it stands to reason that controlling the applied stress or residual stress goes a long way to preventing a failure. With regard to applied stress, it is best to avoid designs that can introduce high stress concentrations. The use of Finite Element Analysis (FEA) to assess the stress concentrations present in engineering designs is often employed to minimise stress concentrations so as to avoid stress-related corrosion and material fatigue issues.

Right: SCC in a pipe weld



Left: Highly branched SCC in a ductile metal

CORROSION 'DOWNUNDER'

On May 1st 2024, it was announced that Sunny Perry of Kerikeri High School had won the 2023 Prime Minister's Future Scientist Prize for her project mapping locations of corrosive soil around Northland.

*Sunny Perry of Kerikeri High School is the winner of the Te Puiaki Kaipūtaiao Ānamata Future Scientist Prize.
Photo: © Royal Society Te Apārangi*



Assisted by her father, samples were collected at 20 sites across Northland: from north of Kaitaia, down to Mangawhai, and across to the west coast.

At each site, Sunny took triplicate soil samples at different depths which she then brought back to her makeshift chemistry lab to test for the presence of "acid sulphate soil." Acid sulphate soils can form naturally in waterlogged areas rich in organic matter and devoid of oxygen, typically though not exclusively adjacent to coasts.

The soils contain crystals of pyrite – iron sulphide minerals. When the soils lie undisturbed, they are safe and harmless. But if they are dug up or drained (so the water level drops), and exposed to oxygen, the pyrite in the soil reacts with the oxygen, producing sulphuric acid. The acid lowers the pH of the soil, which can cause damage to infrastructure, flora and fauna.

To avoid problems from these soils, you need to

know where they are likely to be, and this was the aim of Sunny's project. She has applied her knowledge of the conditions needed for the formation of such soils to identify potential sites, and used her mapping skills and the results of her soil sample testing to create a map of Northland showing where these acid sulphate soils might be.

Such soils have already caused problems for Whangārei District Council, corroding concrete pipes in the Marsden City development at Ruakākā.

The damage is estimated to have reduced their service life from 80 years to around 15 years, and created unanticipated costs for ratepayers.

Auckland Airport has had occurrence of it too, having had to add eight tonnes of lime to a stream on its property in 2016, after plants started to die around it.

Submitted by John Duncan

ACA APPLICATOR AND COATINGS ROADSHOW - further date changes

Venues with amended dates for these all-day events have now been confirmed. AUCKLAND DATE is now **Monday, 29 July** and CHRISTCHURCH will be **Thursday 1 August**. Venues remain the same.

Note that dates have been postponed by one week due to late registrations that will allow the second,

additional CIP1 training course to be held **22-27 July**.

More details will be confirmed in a few weeks' time, but meantime save these dates into your calendars and contact Rachelle.Rigby@corrosion.com.au if you would be interested in being involved as an exhibitor and/or sponsor.

ACANZ HAS DONEE STATUS FROM IRD

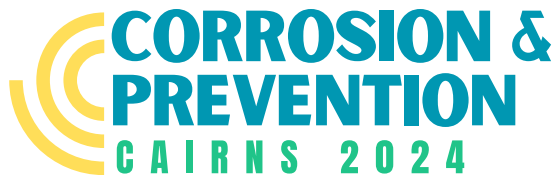
The NZ Inland Revenue Department has confirmed that ACA NZ Branch Inc. has been added to its list of Donee organisations. This means that donations received from NZ companies or individuals to our Scholarship Fund are eligible for a tax rebate. Scholarships are managed by the ACA Foundation and currently include the NZ funded Arthur C Kennett Memorial Award and the Phoenix Solutions Training Award.

The ACANZ Committee would like to also establish

a Young Corrosionist Conference Attendance Award in the memory of our former Branch Executive Officer (1995 – 2001), Branch Historian, Past Branch President (twice) and ACA President (1984-85), and Life Member Ray Osborne.

Companies who might be interested in sponsoring this, or other Awards to assist ACANZ members in furthering their corrosion prevention training, are invited to contact the ACANZ Branch President or Treasurer.

Submitted by Willie Mandeno



NAVIGATING CORROSION CHALLENGES IN MARINE and COASTAL ENVIRONMENTS

10 – 14 November 2024

Cairns Convention Centre (*Main Conference*)
corner Sheridan and Wharf Streets

Join us at C&P 2024 as we navigate all things corrosion!

Cairns is a unique city located on the north-east coast of Australia, and is home to the world heritage-listed Great Barrier Reef and wet tropics rainforests.

The Cairns Marine Precinct, which the Australian Government has committed \$180 million towards, is on track to begin later this year. This is expected to create 460 construction jobs while delivering a 5,000-tonne ship-lift, three ship hardstand areas and other components – which will support bigger ships and contracts coming in, underpinning more revenue and local jobs.



Corrosion & Prevention 2024 will feature a full program of peer-reviewed papers and case studies, technical forums, research symposium, networking and more. The conference will be a platform for industry field practitioners who combat corrosion on a daily basis and researchers working in corrosion-related fields to share and exchange ideas.

The Australasian Corrosion Association Inc. acknowledges the traditional owners and custodians of country throughout Australia and acknowledges their continuing connection to land, waters and community. We pay our respects to the people, the cultures and the elders past, present and emerging.

Local shipwreck is a ticking environmental time bomb



The Royal Mail Ship Niagara was a merchant steam ship built and launched in Scotland in 1913. In her 27-year career, the transpacific merchant ship made 162 round trips between Australia, New Zealand and Canada carrying mail, cargo and passengers.

RMS Niagara was registered in London by the Union Steam Ship Company and she was the first oil-burning steamship certified to carry passengers.

In 1918 it was rumoured but never proved she was instrumental in the spread of Spanish Flu to New Zealand by a sick, flu-infected crew.

On the 19th June 1940 RMS Niagara was sunk by a German contact mine that had been laid off the Hauraki Gulf to blockade Auckland Harbour by the WW2 German merchant raider Orion. The Niagara sank just off Bream Head, but the only fatality was the ship's cat "Aussie" - the 250 crew and passengers were all rescued in her 18 lifeboats.



On board Niagara were 590 gold bars being secretly transported by the UK Government to Canada to pay for war munitions supplied by the USA. Almost all the gold bars were salvaged, mostly during 1941; the salvage operation was an extremely dangerous task for divers working on the Niagara wreck in a live mine field.

RMS Niagara was bunkered with fuel oil when she sank to the sea floor at a depth of 120 metres. Blobs of heavy fuel oil have leaked from the ship's bunker tanks ever since, already causing some environmental damage around the Hauraki Gulf north of Auckland.

However, in the last decade corrosion and weakening of the steel bunker tanks has exacerbated the leaking fuel oil problem.

In the past, Maritime New Zealand has said it did not know how much oil was still in the Niagara's bunkers, although it agreed there were large oil spills at the time of the sinking and later during salvage operations.

It has been estimated that there are still 1,500 tonnes of heavy fuel oil aboard the wreck in steel bunkers that had so far, more or less, held their own against corrosion by the sea – four times the volume deposited by the Rena on Bay of Plenty beaches. However, year by year, the wrecked ship is breaking



down. As well as corrosion of the bunker steel, the wreck is biologically "imploding" - there are bacteria in seawater that eat away at the iron.

Structurally over time, the ship is losing its strength and could suddenly collapse. The RMS Niagara wreck is not lying upright on the sea floor, and ships are not designed to be in that position.

A team of underwater experts has asked for the Auckland and Northland Conservation Boards to back a plan for a new high-tech survey of the Niagara wreck. They say that presently the ship is an environmental time bomb ticking away in a sensitive marine environment.

How industrial coatings impact the selection of spray equipment

No matter your industry, the success of any coating project hinges on having the right equipment. It's not just about spraying - it's about dependably delivering your coating type at the right application rate, under your specific operating conditions.

Operating Environment Matters

Different environments demand different spraying equipment. Factors like temperature and humidity aren't just considerations for coating application but also for the equipment itself.

Ever faced icing issues with pneumatic pumps? You're not alone. Compression of ambient air can lead to icing and pressure loss. That's why a robust motor design is crucial, mitigating icing concerns. Plus, if you're working in hazardous locations, pump type becomes critical—petrol-powered pumps are often a no-go here. Opting for electric? Ensure its explosion-proof for hazardous environments.

Portability & Practicality

When it comes to spray equipment, portability matters. Whether it's cart-mounted or manoeuvrable by one person, the right size and mobility can make or break efficiency. Larger pumps might promise higher application rates, but they could sacrifice portability.

Especially in places like construction sites where space is tight, mobility is key.

Discover Best Practices with Strouds

At Strouds, we're more than just suppliers - we're partners in your coating endeavours across New Zealand. We operate nationwide, conducting thorough product and application trials with major coating manufacturers, giving us the expertise to guide you in equipment selection. Have coating challenges? Let's tackle them together!

Joe Bresnahan Projects Manager

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ACA NZ BRANCH COMMITTEE & OFFICERS 2024-25

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Applicators & Coatings 2024 ROADSHOW

Auckland | Christchurch | Sydney | Perth

Presented by



THE EVENT

The Applicators and Coatings Roadshow is a joint event delivered by our Applicators and Coatings Technical Groups. This will be a fantastic opportunity to bring the industry together, raise awareness of new technologies, maintain and develop new Standards, support training opportunities and more!

LOCATIONS & DATES

Auckland - Monday 29th July | Waipuna Hotel, Mt Wellington, Auckland

Christchurch - Thursday 1st August | Chateau on the Park, Riccarton, Christchurch

WHAT'S ON

Activities

- ✓ Technical Presentations
- ✓ Equipment Demonstrations
- ✓ Professional Skills Development
- ✓ Forums and Q&A sessions
- ✓ Social events

*Event schedule available on the website.

Price

Starting from \$200.00 AUD ex GST
(includes food and drinks)

Time

8:00AM to 6:00PM
(All Day Event)

Registration Link

www.corrosion.com.au/events/upcoming-events/



SPONSORSHIP PACKAGES



**MAJOR SPONSOR
(SEMINAR) – \$3500 AUD**
Price is per location

Inclusions:

- Major advertising
- 1 x Complimentary Trade Table
- 1 x Complimentary Tickets
- Welcome/Farewell announcement
- Complimentary Opportunity to submit a proposal for a technical (non-commercial) presentation

1 x Sponsorship available for each location \$3,500 ex. GST



**SUPPORTING SPONSOR
(SEMINAR) – \$1500 AUD**
Price is per location

Inclusions:

- Secondary advertising
- 1 x Complimentary Trade Table
- 1 x Complimentary Ticket

1 x Sponsorship available for each location \$1,500 ex. GST



**MAJOR SPONSOR
(OUTDOOR DEMO) – \$3500 AUD**
Price is per location

Inclusions:

- Major advertising
 - 1 x Hour presentation with min 50m2 area
 - 1 x Complimentary Trade Table
 - 1 x Complimentary Ticket
- (All equipment and hoarding to be provided by sponsor)

1 x Sponsorship available for each location \$3,500 ex. GST

SPONSORSHIP PACKAGES



**SUPPORTING SPONSOR
(OUTDOOR DEMO) – \$1500 AUD**
Price is per location

Inclusions:

- Secondary advertising
- 20 minute presentation with min 15m2 area
- 1 x Complimentary Trade Table
- 1 x Complimentary Ticket

(All equipment and hoarding to be provided by sponsor)

1 x Sponsorship available for each location \$1,500 ex. GST



**BREAKOUT TRAINING
SESSION – \$600 AUD**
Price is per location

Inclusions:

- 1 x Complimentary Ticket
- Separate 2-hour session for Applicators to occur concurrently to technical presentations.

1 x Sponsorship available for each location \$600 ex. GST



**TECHNICAL PRESENTATION
(NON-COMMERCIAL)**

Complimentary

- Opportunity to submit a proposal for a technical (non-commercial) presentation.
- Need to have purchased 1 x Ticket

7 x spots available per location

SPONSORSHIP PACKAGES



**TRADE TABLE (NEW
ZEALAND) – \$500 AUD**
Price is per location

Inclusions:

- Single table within lobby for sales materials.
- 1 x Complimentary Ticket

4 x Sponsorships available for each location in NZ \$500 ex. GST



**TRADE TABLE
(AUSTRALIA) – \$900 AUD**
Price is per location

Inclusions:

- Single table within lobby for sales materials.
- 1 x Complimentary Ticket

4 x Sponsorships available for each location in AUS \$900 ex. GST

REGISTER YOUR INTEREST

MORE TRAINING OPPORTUNITIES IN NEW ZEALAND

Coating Inspector Programme

CIP1 | NZ | 8-13 Jul 2024 OR 22-27 Jul 2024 Level 1

This is the first step on the Coatings Inspector ladder. This foundation course delivers all the basics to start your paint inspector journey. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-1-tester-or-nz-or-14-18-oct-2024-4a2ZI7235y/overview>

CIP2 | NZ | 15-19 July Level 2

This course is the next step in earning the Certified Coatings Inspector Certification. For more details and to reeregister, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-coating-inspector-program-level-2-or-nz-or-15-20-jul-2024-4a2ZI71VVw/overview>

ACA ACRA Corrosion & Protection of Concrete Structures & Buildings

ACRA | NZST | 25-26 Jul 2024

This course covers the mechanisms of corrosion, protection and repair of reinforced concrete structures and buildings. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-acra-concrete-structures-and-buildings-or-nzst-or-25-26-jul-2024-4a2ZI71kEw/overview>

AMPP Cathodic Protection

CP1 | NZ | 14-18 Oct 2024 Level 1 Tester

This course is the first of AMPP's Cathodic Protection series, covering both theoretical and practical CP techniques. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-1-tester-or-nz-or-14-18-oct-2024-4a2ZI7235y/overview>

CP2 | NZ | 21-25 Oct 2024 Level 2 Technician

This certification indicates intermediate-level knowledge of corrosion theory and CP concepts, types of CP systems, and advanced field measurement techniques. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/ampp-cathodic-protection-level-2-technician-or-nz-or-21-25-oct-2024-4a2ZI7236D/overview>

ACA Coating Selection & Specification

CSS | NZST | 21-23 Oct 2024

This course addresses the guidelines for writing paint coating specifications that are fit for purpose. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-coating-selection-and-specification-or-nzst-or-21-23-oct-2024-4a2ZI7236S/overview>

ACA Corrosion Technology Course

CTC | NZ | 25-29 Nov 2024

This is a great foundation course for all corrosion professionals. For more details and to register, go to: <https://events.blackthorn.io/en/5j1hxgo7/g/3VggT5Fffm/aca-corrosion-technology-course-or-nz-or-25-29-nov-2024-4a2ZI71kFV/overview>



ACA Membership Benefit



The Australasian Corrosion Association and Young Corrosion Group (YCG) are excited to announce a new benefit for our Corporate Members.

Now, you can add YCG delegates to your account, expanding your membership and connecting with emerging talent in the corrosion field. YCG Delegates receive the same benefits as individual members at no additional cost, providing a valuable opportunity to support young professionals under 35 years old.

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UNLIMITED YCG DELEGATES

PLATINUM
10 YCG DELEGATES

GOLD
5 YCG DELEGATES

SILVER
3 YCG DELEGATES

BRONZE
2 YCG DELEGATES



To add YCG to your account please reach out to katrina.almoneda@corrosion.com.au