

The IChemE Safety Centre

2021 Annual Report

Not getting hurt is a basic human right

People have a right to not get hurt, no matter where they are. Sadly, the high hazard industries have not always measured up against this moral imperative and the Institution of Chemical Engineers (IChemE) recognises that eternal vigilance, proactive learning, and constant improvement are the price of outstanding safety performance. This was the driving force that catalysed the idea of a new IChemE Safety Centre (ISC) at the beginning of the decade.

The centre will celebrate its eighth anniversary at the beginning of next year. It has grown rapidly from its modest beginnings back in January 2014 when six founding partners came together with the aim of creating a new framework for process safety built around leadership across six functional areas.

- knowledge and competence
- systems and procedures
- human factors
- engineering and design
- assurance
- culture

These areas apply to all industries, at all points in the business life cycle. In acknowledging this proposition, the founding partners unlocked a powerful learning process and the ISC began to explore and develop the concept of sharing for safety across different industries.

Today, as 2021 draws to a close, the ISC provides a dynamic network for 44 companies, along with a further 42 supporting partners and collaborators from academia, government, and other process safety centres of excellence.

This short report expands on the values and behaviours that underpin our work. It describes our achievements to date, and it sets our ambitions for the years ahead. IChemE does not have a monopoly on wisdom and we recognise that safety is not proprietary; that is why the centre aims to share best practice and encourage others to do likewise. Join us on the journey to process safety excellence at the ISC.

Stay safe.

Trish Kerin

Director, ISC
December 2021



Membership

Operating partners

These companies are represented on the ISC's advisory board. They set the strategic direction for the centres. The ISC Advisory Board is chaired by Margaret Donnan.

- Anglo American, Shahana Buchanan
- AusGrid
- BHP, Marcus Lemin
- BP, Dave Fargie
- Chevron, Ellen Ross
- EnQuest, Ross McCormack
- ExxonMobil
- Jemena
- Oji Fibre Solutions, Stephen Kast
- Orica, Michael Gill
- Origin Energy, Shane Minty
- Petronas
- Rio Tinto
- Santos, Kim Pullon
- Shell, Manoj Pillai
- SnowyHydro
- Todd Corporation
- Unilever, Jonathan Jett-Parmar
- Viva Energy, Emma Stuart
- Water Corporation WA
- Wessex Water, Mohammed Saddiq
- Woodside, Claire Cabiac

Industry partners

Employees from these companies play an active role in the centre's working groups.

- Acting Consulting Training (ACT)
- AMOG Consulting
- Arup
- CNA Hardy
- Dekra
- Exida
- FM Global
- HIMA
- ioMosaic
- Industry Risk Control
- IRESC Global
- KBR
- PDQ Scotland Limited
- PDV Consultants
- PSRG
- Process Safety Verification
- R4Risk
- RAS Limited
- RiskConsult
- Safety Solutions
- Sherpa Consulting
- Worley

Supporting partners

These organisations are invited to participate in ISC activity and support our work.

- Aston University
- Civil Aviation Authority of New Zealand
- Dalhousie University
- Government of South Australia
- Institute of Chemical & Engineering Sciences (A*Star)
- Latinamerican Council for Process Safety (CSP)
- Ministry of Environment and Food of Denmark
- Michigan Technological University
- Monash University
- Newcastle University
- Norwegian Directorate for Civil Protection
- Oil and Pipelines Agency
- Petroleum Safety Authority Norway
- Purdue Process Safety & Assurance Center
- Queensland University Technology (QUT)
- RMIT University
- SafeWork NSW
- Singapore Institute of Technology
- Universiti Teknologi Petronas
- University of Adelaide
- University of Auckland
- University of Bath
- Università di Bologna
- University of Canterbury
- University College Cork
- University of Greenwich
- University of Leeds
- University College London
- University of Limerick
- University of Manchester
- University of Melbourne
- University of New South Wales Sydney
- University of Patras
- University of Sheffield
- University of Strathclyde
- University of Surrey
- University of Toronto
- University of Western Australia

Collaborators

ISC seeks to collaborate with other safety centres and has agreements with these organisations.

- Mary Kay O'Connor Process Safety Center
- Center of Safety Excellence
- Centre of Advanced Process Safety
- Jordan Engineers Association

We are a values-based organisation

ISC's operation is guided by a series of underlying values. These have been agreed by our advisory board. All work programmes and activities are benchmarked against these values.

ISC is a thought leader in process safety for the simple reason that creating a world in which the highest standards in process safety are maintained everywhere, at all times, is absolutely the right thing to do. ISC strives to do what is right and we always want to do things better today than we did yesterday. Our expectations are high, and we constantly seek continuous improvement. We will collaborate with others whenever it is appropriate to do so. Process safety depends on partnerships, and we will respect our partners by keeping our promises and doing what we say we will do.

A year of progress and delivery

With the COVID-19 pandemic continuing in 2021, plans and events remained on the virtual platform, and the ISC team continued to actively deliver and engage with members and non-members alike.

ISC member conference

The ISC held their first member only conference in May 2021. The topics covered were hydrogen safety, cyber security in process plants, functional safety, COVID supply chain to name a few. This was well received by members.

Webinars

The ISC team continued to deliver webinars as travel restrictions and lockdowns continued in 2021. Topics ranged from Safety Lore, Lead Metrics Permit to work, hydrogen incident taxonomy and hazards identification to name a few. Attendance and views of webinars remained in the thousands and were spread across the six continents.

New guidance

With the ongoing pandemic, industries and companies had to adapt to all health advice and regulation requirements. Face to face meetings were replaced with virtual meetings due to travel restrictions, mandatory quarantine in some locations, the need to maintain physical distancing and capacity limits. This led to the development of the guide *Good practice in virtual HAZOP*, based on the inputs from ISC members and the lessons they had learnt to make virtual risk assessments more effective and avoid pitfalls.

The ISC released a new guidance document on a risk assessment technique called *Delta HAZOP*. The traditional HAZOP process is a structured process that, when done well, produces a robust and thorough analysis of failure scenarios and identifies safeguards to manage the risk. Where a HAZOP is repeated, or another form of PHA continues to be repeated through the life of a facility, the finding of significant issues is likely to decrease after two or three cycles. Therefore, to achieve a high-quality output, where items of significant value are uncovered, it is necessary to look at the process differently. This realisation led to the development of a process known as Delta HAZOP. This is a step change in how assessments are done and represents a new way of thinking. A training package is being developed to support people undertaking Delta HAZOP.

The ISC issued guidance on *Permit to Work*, a supplement to the ISC guidance document *Lead Process Safety Metrics – selecting tracking and learning 2015*. This guidance provides context for the lead metrics in the original guidance.

The ISC issued another guidance document *Alarm Rationalisation*, a supplementary guide to the ISC guidance document *Lead Process Safety Metrics – selecting tracking and learning 2015*. The *Alarm Rationalisation* guidance provides context for alarm rationalisation which can be used for monitoring and managing the lead metric 'critical alarms per operator hour' and 'standing alarm' defined in the ISC guidance document under the human factor element.

The *Process Safety experiences during industrial placements for undergraduate engineering students* – the diary scheme was produced by the ISC to provide advice on how best to enhance a chemical engineering student's work experience to include elements of process safety.

Safety lore

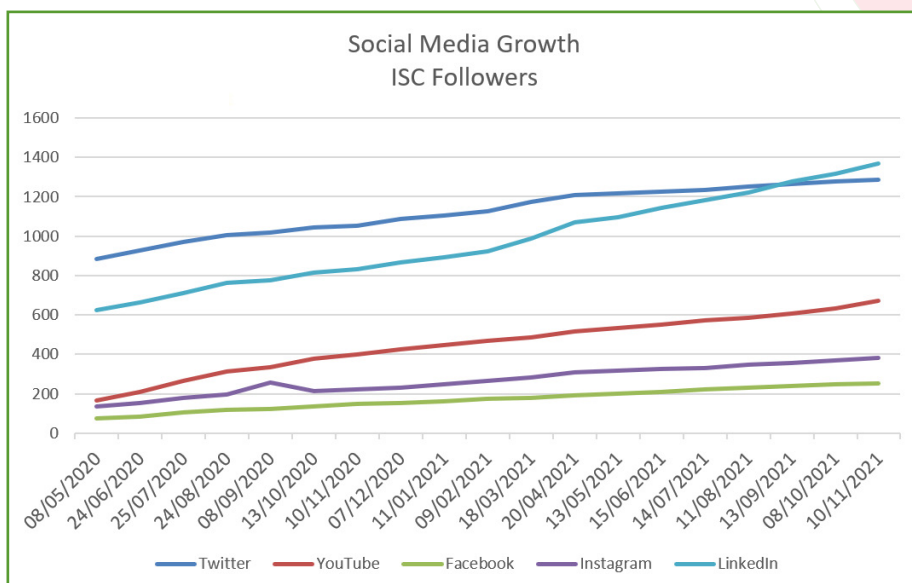
ISC launched the first issue of the *Safety Lore* in March 2018, and it has continued to expand and grow, with four editions per year. We now offer this bulletin in both written English and Spanish, an English podcast, and an English webinar. This helps ensure that no matter what your learning style, there is a way for the information to be accessible to you.

Case studies

The ISC released their tenth and eleventh case studies in the series. *Fun Park* – human elements of failure to learn exposes the user to a series of challenges associated with learning to operate a theme park ride. It covers learning from previous incidents or near misses and explores the human factors elements involved. *Safe Anyway* – creeping changes exposes the user to a series of changes made to an aircraft fleet. It assesses the risks of extension to the fleet, the organisational changes, and the role of the safety case.

Social media

From the start of 2020 the ISC has produced a range of incident anniversary videos targeted toward a social media audience. We have continued to produce these short videos across 2021. This has kept our learning information available to a wide audience when we were not able to travel. This content continues to be well received and our social media impact continues to grow month on month, with an average growth across all channels of 110% since May 2020. We post content across LinkedIn, Facebook, Twitter, Instagram, and YouTube, making our resources easily available for people.



Other activity

Due to the ongoing pandemic, the ISC continues to be involved with fully interactive virtual events. While this was certainly a very different way to both present and engage at conferences, we still saw interest generated in our work and continued to build recognition of our resources. We continued to engage with members all over the world, delivering webinars and providing virtual facilitation of ISC Case Studies. This saw the ISC membership going against the general trend of contraction in the pandemic and ISC continues to grow each year, as companies recognised the value we add to their process safety journey.

IChemE's Major Hazards Committee

At the direction of the IChemE Board of Trustees in 2020, the ISC has led the establishment of IChemE's Major Hazards Committee. This committee is chaired by the ISC Advisory Board Chair, Margaret Donnan and the Deputy Chair, Steven Flynn is nominated by the Learned Society Committee. The MHC brings together representatives from across the IChemE membership, including the Safety and Loss Prevention Special Interest Group, the IChemE Safety Centre member companies, the Hazards Committee, the Loss Prevention Panel and Process Safety and Environmental Protection Journal editorial board. The MHC has developed an agreed agenda for Major Hazards Management across IChemE and initiated two projects. The first is looking at how lessons are shared and ways to improve the learning and the second is to understand and map the process safety competence development of an engineer across their career. These projects are led by the MHC members with the support of volunteer teams from the IChemE membership.

Where do we go from here?



The year 2021 has provided immense challenges, no matter where you are. Effective management of process safety has remained as important as ever, and there has been an increased focus on leadership at this time. The IChemE Safety Centre is committed to continuing to develop and share useful resources in process safety so that everybody, no matter where they are, can access the information they need to play their part in improving process safety outcomes. Because nobody should get hurt, anywhere, ever.

We welcome your support and input to our valuable work. Please contact us if you would like more information on the ISC, its work or how it may add value to your organisation.



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