Wendy Owen's SSS'22 Pre–dinner speech

Wendy Owen, currently a Research Associate in fusion energy at Bangor University, gave a pre-dinner speech at the SSS'22 Banquet, providing insights into her own career in system safety and describing the highs and lows of co-authoring the "30 Years of Safer Systems" anthology of SCSC Newsletter articles, published to celebrate the 30th Anniversary of the Safety-Critical Systems Club.



So, here we are, 30 years after the SCSC came into being. That's about half a lifetime ago for some attendees, including myself, and – thankfully perhaps – some of us are still around as well.

The SCSC came into being at a significant time in my own life. Back in 1991, I was in the last year of UKAEA's graduate scheme, working at Winfrith in the wilds of Dorset, conducting safety analyses of the UK's first civil small modular reactor (SMR) – what civil SMR you say? Yes, there was one in the pipeline back then, but the project was canned a year later. The idea and prospect of civil SMRs has actually only been resurrected very recently, and you may have seen news articles on the subject. I suspect, if climate change had been taken more seriously back then, we might have a few SMR power stations by now. That year, I also found myself conducting reliability analysis on another first, as far as I know – the first computer-based trip system for a UK nuclear plant, at Dungeness B. I also had an unforgettable work trip to Switzerland (long story, ask me later).

The following year I was relocated to the Safety & Reliability Directorate (SRD) in Cheshire. It was whilst at SRD that I first became aware of the SCSC, and subsequently signed up on-and-off over the years. At some point, I even wrote a Newsletter article called "The Right Ballpark", which was about data uncertainties and risk bandings, in an era before the risk matrix approach became popular.

One of my previous colleagues once made an astute observation that, "Wendy is at her best with 'Projects In Distress' "

30 years later, I find myself back in the nuclear sector – this time in the fusion arena – having worked in many other sectors since, and also unexpectedly working in academia. This means I find myself with a bit more time on my hands for non-work type work compared to when I was in industry, including supporting organisations like the SCSC.

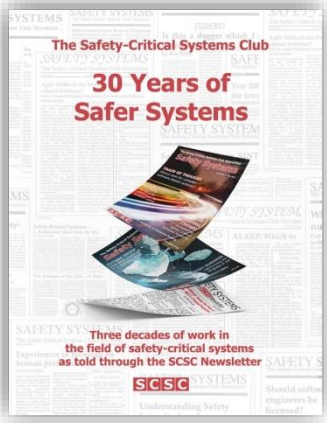
This turned out to be rather convenient for Mike, as although he already had several editors primed for the 30th anniversary book, another one was needed if SCSC was going to get it out the door before this conference.

One of my previous colleagues once made an astute observation that "Wendy is at her best with 'Projects In Distress' ", which sometimes appears as a quote on my CV. I wasn't sure if Mike's email was going to result in a distress call. It turned out that one of the editors wasn't very well – indeed it later transpired that they were expecting a baby – and one of the book's chapters was called "Mayday Mayday Mayday". So, of course, I said Yes.

To put the timeframe in perspective, that call was last May, and we've been having almost weekly meetings since then, and there are five editors involved. That's a lot of work, and indeed, generally a lot of teamwork, as everyone assumed slightly different roles. Also sometimes a lot of debate – the healthy variety – especially when the original title was "30 at 30"; but then one day, we realised that over 40 papers were included. We tried to delete some, but honestly, it was really hard to delete any of them because they were all so good. So, instead, we changed the title to what you see today, and the book contains 46 papers, which, co-incidentally, is the number of conference participants in this room this evening. Anyway, there's always a way around a problem, I like to think.

Within the book, there are the "green themes", or chapter headings, which have – by any engineer's admission – some great titles, mainly thanks to Louise Harney:

- AS LOW AS RUMOURED POSSIBLE
- AYE, ROBOT
- COMMUNICATION FAILURE
- CULTURE VULTURES
- DESIGN FOR UNSAFETY
- FROM HARDWARE TO HELL
- MAYDAY MAYDAY MAYDAY
- BLACK SWANS
- RUBBER–STAMPED
- RUN DON'T WALK
- SIGN YOUR LIFE AWAY HERE
- DRIVER, PLEASE STEP OUT OF THE VEHICLE
- THE FIRST STEP IS ACCEPTANCE
- THE FORGOTTEN ELEMENT



And lastly, TWO ARPS TO SOLVE THEM ALL

(I still can't remember what an ARP is, but it sounds like you'd need one).

My own contribution was mainly to the "blue boxes", which involved finding notable accidents and significant published legislation, standards or guidelines for specific years, or other technology-related milestones, and writing some poignant text about them, one for each newsletter article. However, they couldn't be any old accident or standard, because Louise had already drafted the chapter introductions – those themed "green boxes" – and the newsletter articles had already been selected too. The blue boxes hence needed to act as a link between Louise's green boxes and the original newsletter articles. It all needed to connect, make sense and be a good read. Suffice to say, I lost count of the number of blue boxes I'd written, but the rest of the team liked them, so that was OK!

Mike, Paul and Roger were conducting the same exercise, so we also had to make the blue boxes look consistent, as if they were written by the same person – for bonus points you can try to guess who wrote which blue box!

The others wanted to bring a few non-safety events into the picture; I wasn't convinced about this approach and ended up clamping down on specific terrorism events, but was unable to stop the flow of advancing mobile phone technology and certain infamous contemporary artworks, so please don't blame me for those…

I recall 1999 and 2000 produced a lot of text due to the Y2K issues, and there were sometimes so many railway and aviation accidents it all got a bit confusing which year was which, and which to make case studies of. Occasionally, for some years, there simply weren't enough highlights, which was actually harder to deal with as we scraped around trying to find interesting things to talk about.

Sometimes years and articles got accidently muddled up – no mean feat to sort out when you're working with a 300-page document, but Paul came to the rescue on many editorial occasions. Paul, I have to say, is also an expert document formatter (if he wasn't before).

For those of you with a penchant for numeric data, I expect you to ponder for a while over the penultimate page, page 304, which provides a Year Index and also cross-references to papers from the 25th anniversary edition. In this 30th edition, 1998, 2010 and 2017 ended up as the most prolific years, with four papers each, whilst 1995, 1997 and 2011 didn't make the grade, with no representative papers. We thought we'd point this fact out now because otherwise some of you would no doubt pick up on it, and perhaps even complain about it! However, we don't have an answer as to why 1995, 1997 and 2011 turned into "gap years", but you will find that the 25th edition also had gap years (in fact more than this current edition). Hence, we propose this as a challenge for whoever writes the 35th edition!

Whilst all this was going on, we made attempts to contact all the original authors of the articles, to check that they were happy for their articles to be published – and also, if possible, to provide a postscript. Many were tracked down through personal contacts and LinkedIn (I think I found a calling as a detective), and in fact, most authors have provided postscripts, for which we are all very grateful.

Many postscripts are technical in nature, some are very short, others are large essays, but I have two favourite postscripts myself – a one-liner essentially saying something like "nothing much has changed in 110 years or so since this article was written", and another, that alludes to the fact that the author, since writing the article, changed from caffeinated to decaf coffee, and nowadays, thinks quite differently. I am sure you will find your own favourites hidden in there too. You will also find many highlighted quotes from the articles scattered throughout the book, where we ended up with blank pages. I think these add a nice touch that my old O-Level English Literature teacher would have highly approved of before he abandoned our class and ran off with a Jazz band; consequently, I didn't get a particularly good grade for O-Level Literature and have spent a long time trying to compensate for it, including this speech.

I have two favourite postscripts myself – [one] essentially saying something like "nothing much has changed in 110 years or so since this article was written"

Back to the book. We all reviewed each other's editorial work and contributions, and the document went through two main drafts before the publication issue.

As with any good independent safety review process, suffice to say, we ended up with quite an extensive Corrective Actions sheet. With a 300-page book, let us tell you that it's a lot easier to spot problems on a paper version you can flick through rather than on a computer screen, so it was actually available on Amazon a lot earlier than you think it was, because we had to buy the paper drafts... Fortunately, I had accumulated a few Amazon vouchers the previous year and these were put to good use.

To finish, it has definitely been an enjoyable, and enlightening exercise, and we hope that you will appreciate everything that we've written, and what the article authors have written, both past and present.

Also please don't forget to read the Final Words from the Editors on the final page, which I will read for you here this evening for convenience:

And so it is that, with a virtual nod and a bow to all these enlightening papers and their erstwhile authors, we bid our farewells to the last three decades of safer systems.

As we edit this book in the midst of a global pandemic due to COVID–19, we know that this sort of event has been predicted for many years, and yet it appears we have been caught largely unprepared. Moreover, many of the systems – from infection spread models to vaccination certificate apps – used to manage the virus have been put together quickly and, in many cases, have been found wanting. This is a real source of frustration; we could have taken a much more engineering and assurance-led approach to management of the epidemic if we had been prepared …

We can only contemplate, from our own COVID hidey-holes, with ongoing advances in technology and increasing concerns about climate change, what challenges the next decade will bring, one earlier-than-expected fine spring morning, basking in the increasingly hotter summer sunshine, hidden amongst the autumnal leaf scatterings or thrown up in the midst of more severe winter storms. Will it be autonomous self-driving vehicles? Will it be planes and trains running on hydrogen? Will it be regular rocket travel to Mars?

As safety engineers, we very much hope that we make a difference to people's lives, and it is true to say that we do save people's lives, in our own way. We may not be NHS paramedics, firefighters, the RNLI or Mountain Rescue, but we do make the systems, upon which these organisations depend, safer.

Paul, Louise, Wendy, Mike and Roger. December 2021

Until next time, I hope that this book will grace many coffee tables (and I live in hope that maybe next time someone will pick up on "The Right Ballpark"). Thank you for listening, and please… keep safe!

Wendy Owen

Wendy Owen is currently a Research Associate at Bangor University. In 2021 she moved into academia, following a 30+ years career mainly in engineering consultancy, managing safety & dependability cases, projects, bids and teams, and covering a wide range of highly-regulated industries including nuclear, defence, rail, process, aviation and automotive. She currently works in the Safety, Regulation & Policy Group within the Nuclear Futures Institute (NFI) at Bangor University. She supports development of design safety guidelines for future fusion power plant, covering safety, radiological safety, security and environmental protection.

See the back cover for further details of the "30 Years of Safer Systems" book.