Design Services Alliance
Sellafield Ltd AXIOM Progressive ALLIANCE

NEWS BULLETIN April 2022

A regular update on DSA projects and people

Expo opens eyes to wider application of digital technology

The DSA Digital Expo was hugely successful in showcasing technological reach back which can provide solutions to many of Sellafield's challenges. About 150 visitors, including students from Warrington UTC, came to the Engine Rooms in Birchwood Park on March 30 and were rewarded with insights into many areas where the DSA partners are advancing the nuclear industry's digital frontiers.

Nuclear Virtual Engineering Capability is a UK government funded research programme, led by Jacobs, which is aimed at harnessing digital innovation to pursue the aims of the Nuclear Sector Deal - cost savings of 30% on new build, 20% on decommissioning, and a more competitive supply chain. Albrecht Kyrieleis, Jacobs Principal Consultant, said: "NVEC is about developing a collaborative digital environment to support the nuclear life cycle. It uses established technology where possible and is open and highly flexible. For example, to aid the analysis of graphite cores in advanced gas-cooled reactors, NVEC has enabled the collaborative use of several relevant software packages through a single user interface."

Another area where this research has proved its worth is the 'Sixth Sense' data analytics system which has enabled Jacobs to devise new techniques for post-operation clean out (POCO) of highly contaminated areas, such as former fuel reprocessing cells in the Thorp plant.

As well as software, there were hardware items to admire. Dean Connor, a PhD researcher from the University of Bristol, showed off two surveying drones which have taken readings in Chernobyl's Red Forest; while Createc's Will Newsom wowed the crowd with his skillful handling of Spot the robotic dog, which can carry out many data collection and inspection tasks in hazardous environments and has already proved its worth by enabling power station clients to reduce the financial hit from unplanned outages.

Mott MacDonald described how scanning

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Pictured l-r: Mike Houghton, Matt Gallimore and Steve Davison with Spot the robot dog

Financial update

At end of period 12	
DSA spend during 2021/22	£108.6m
Cashable benefits	£2.8m
Non-cashable benefits	£4.7m
Schedule benefits	87.4 months

Health and safety

Hours without a lost-time incident	
AXIOM	7,961,359
Progressive	6,530,571
Total	14,491,930

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The DSA now has a home on the NDA Hub. It can be found here: https://ecosystem.org.uk/groups/dsa-hub-sl, but to get access, please email janine.bell@sellafieldsites.com who will invite you. Lots of useful information will be uploaded in the next few weeks.

New programme aims to make the DSA more diverse

The DSA is launching an Equality, Diversity and Inclusion (EDI) programme.
This follows a recent employee survey which found that the DSA is some way short of being a diverse organisation. Out of slightly more than 200 respondents, 165 identified as male and 194 as white, while about 75% were aged over 40.
The new programme's mission is to create an organisational culture that values the contributions that can be made from different demographics and backgrounds and the vision is to have a diverse and vibrant DSA.
Focus groups (and their leads) have been set up for three key areas:
•New to SL and / or nuclear industry (Andrew Crabtree); •Early Careers (Chris Murphy);
•Inclusion for All (Katie Wheeler)
Now that the groups have been defined, volunteers are being sought to support specific focus groups, the Programme Management Office Co-ordination or the EDI programme in general. If you would be interested in joining a group or volunteering to become the EDI Programme Co-ordinator, which is a great opportunity to gain programme management experience, please contact sarah.firth@axiomjv.com
If you'd like any further information on the programme or to discuss any of the roles, please reach out to Sarah, Martin Lyons martin.lyons@axiomjv.com; or Steve Davison stephen.davison@cavendishnuclear.com; who will be happy to share more detail.

DSA Digital Expo shows how nuclear can better harness tech

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technology has been of huge benefit to the Redundant Facilities Characterisation Programme. Using a laser scanner the size of a desktop printer, a 3D digital representation was created of disused plutonium laboratories on the Sellafield site which are due for demolition. "The end product was a building report which provided the information needed for safe and accurate demolition of the facility, as well as forecasting the various waste streams that will need to be disposed of, along with their levels of contamination," explained Mott MacDonald's Adam Parker.
Richard Hunter described how Cavendish Nuclear's fast neutron detector system PHUMS has been used to measure the nuclear material content of gloveboxes which were contaminated to varying extents with plutonium. "It's a portable assay system which calculates plutonium mass and distribution with greater accuracy, which is a major step forward for safety case and POCO strategy," he added.
Assystem exhibited several advanced Data Science project case studies, including an automated requirement elicitation tool, DeepREXT, which has recently been used on a project for the French nuclear regulator.
Guillaume Ebelmann also showed some examples of projects which used VR to assist with operator training, as well as a universal 3D model viewer which can handle 3D data from a wide range of sources, in a variety of formats, for presenting to users via a simple web- based interface.
Assystem's Adam Towse presented the outcome of a recent piece of work for UKAEA, connecting low-cost Internet of Things (IoT) devices to a real-time physics simulator within a digital twin.
AECOM showcased its new Digital AECOM brand which provides an immersive digital toolkit for clients to reach their environmental, social and governance targets.
Additionally, they showcased their bespoke solutions for automating programme creation, improving stakeholder engagement, automating 3D model anomaly finding and digital twins, which use dynamic modelling to provide insights to underpin better decision making in areas such as plant maintenance and asset management.
Chris Murphy, who led on the organisation of the event, said: "I think the day served to open many eyes to the possibilities being created by digital technologies. Nuclear is, quite correctly, a generally conservative industry rather than an early adopter. However many of these systems and technologies are now tried and tested to an extent where the sector can and should be making much more use of them."

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Meet the people who make the DSA's achievements possible

February 2022 marked the 10th anniversary of the Design Services Alliance (DSA), under which Sellafield Ltd purchases about £100 million of engineering, design and safety-case assessment services every year from five international engineering firms – AECOM, Assystem, Cavendish Nuclear, Jacobs and Mott MacDonald.

The 15-year, £1.5 billion contract was launched as a bold attempt to enable Sellafield Ltd to draw more fully on suppliers' capacity and capabilities, while ensuring secure access to competent and capable people. The fact that the DSA has now, with HM Government approval, entered its third, five-year tranche, shows that those aims are being achieved.

The DSA is involved, at any one time, in as many as 170 projects. Its work so far is expected to deliver £220 million of financial benefits – both by reducing the budgeted cost of projects and by removing the need for spending in future years.

It has also shortened hazard reduction schedules by 66 years, speeding up the delivery of projects and helping to achieve the core mission of making the site safe for future generations.

At the same, the DSA has established a strong safety culture, recording 14.5 million hours without a lost-time incident.

In the first part of a regular feature, we hear from people about what it means to work for the DSA.

Mandy Bell, Project Engineer, Progressive

What do you do in your current role?

I'm currently working across a number of projects including support to MSSS Ops Retrievals Tasks, 3M³ Box Design, Hydrogen Deflagration Studies and BEP. My role is day-to-day project management of the task orders and working together with Sellafield Ltd counterparts to ensure that key milestones are completed on time.

How does your work contribute to creating a clean and safe environment for future generations?

It's easy to think that if you are not directly on a major project that you are not directly contributing to a clean and safe environment for future generations but I think one thing that's stood out for me working on DSA is that actually every task I'm working on is an essential cog in the wider machine. Production of operating manuals is an absolutely essential step for enabling retrievals, deploying our skilled designers contributes to meeting critical design deliverables, and utilising our highly knowledgeable supply chain enables us to supply technical expertise and knowledge to key studies.

What has been your proudest moment or greatest achievement while working for the DSA?

I think for me it's not a single moment or achievement, it's working with others to achieve the small wins that happen daily/weekly – from successfully completing a study milestone on time to our engineers being recognised for awards for their contribution to project successes, to providing technical guidance that saves time/cost on projects. These small, consistent wins are enablers to the larger project successes.

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Dave Mason, AXIOM Health and Safety Lead

What do you do in your current role? I am responsible for leading and coordinating health and safety within AXIOM. I undertake a similar role for the DSA ensuring all of the forums and H&S network communicate and are aligned in their purpose and delivery of health and safety within the DSA.

How does your work contribute to creating a clean and safe environment for future generations? Ensuring everyone goes home (or even stays at home) safe and well can only be a good thing for our workforce and those impacted by our designs and engineering solutions. The designs we produce now must consider and choose environmentally sound materials and therefore minimise as much as possible their impact on the environment.

What has been your proudest moment or greatest achievement while working for the DSA? I think the greatest achievements have been when we have come together and collaborated. This has been especially evident for the health and safety conferences, focus weeks, especially the mental health forum. During the early days of lockdown, the support across the network was fantastic.

Rachael Loynes, Senior Mechanical Engineer, Progressive

What do you do in your current role? I lead a team of three designers, working closely with various stakeholders and suppliers to deliver solutions to the complex spatial and containment challenges presented by the decommissioning of highly contaminated ductwork within the First Generation Purification Plant (FGPP).

How does your work contribute to creating a clean and safe environment for future generations? The FGPP ceased operations in 1987, and with passing years the hazards presented by this redundant plant and equipment have only grown in complexity. The design work being undertaken to decommission this plant and equipment will result in the removal of some significant high-level risks, leaving behind a plant that is much safer and cleaner.

What has been your proudest moment or greatest achievement while working for the DSA? I am most proud of my involvement with the work to sample and remove legacy solvents from the cells in the FGPP. It has been really rewarding to help facilitate operator access to the cells and to see them now successfully delivering on such a high priority task, being part of a really great integrated team.

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SCP team's achievements help make the North a bit greener

The DSA's SIXEP Continuity Plant (SCP) team is doing its bit to green the North of England.

It is funding a Greater Manchester charity's efforts to plant trees as part of the new Northern Forest, a major environmental regeneration initiative to restore woodland and plant more than 50 million trees in an area stretching from Liverpool to Hull.

AXIOM wanted to recognise the team for successfully hitting recent Design for Manufacture contractual milestones.

Several team members suggested activities or contributions aligned with the team's passion for environmental sustainability.

Supporting local communities to plant more trees was identified as a natural solution to the removal of carbon as part of our response to climate change.

AXIOM provided a four-figure sum to secure the planting of 123 trees through a donation to the registered charity City of Trees – www.cityoftrees.org.uk.

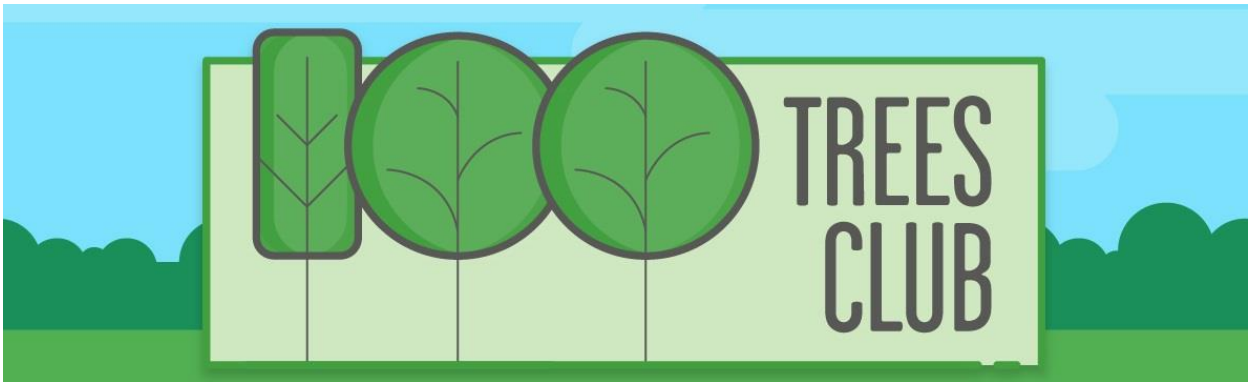
The charity has responded by welcoming AXIOM into its '100 Trees Club' for having facilitated the planting of over 100 trees and enabling more people in Greater Manchester to get involved in supporting the natural world.

City of Trees is committed to delivering a green recovery and tackling the climate emergency head on, working with communities, organisations, and businesses to plant a tree for every citizen of Greater Manchester within just five years, bringing environmental, health and economic benefits.

Three members of the SCP team – Carl Cheston, Allan Clark and Alastair Robertson – helped volunteers from the charity with the actual planting of the trees, which included species such as oak and hornbeam.

The team saw nearly 500 trees planted in a single day and the charity posted on Twitter to pass on its thanks to all members of the AXIOM SCP team, through whose efforts this achievement was made possible.

Planting trees are (l-r) Carl Cheston (Assystem), Allan Clark (Jacobs) and Alastair Robertson (PWHytek)



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Hamper gifts make Easter feel like Christmas for local charities

AXIOM team members delivered hamper packages to Warrington-based charities this Easter.
Yana Malem, in the right on the picture, handed over parcels of biscuits, chocolates and luxury food items to Room at the Inn and Y Project, which provides daytime services to homeless and vulnerable people.
“We opened up all the packages together and they loved them… they said it felt like Christmas!” said Yana.
Allan Clark delivered another six hampers to the Walton Lea Partnership, which delivers supported learning, development and work activities for vulnerable adults and young people with learning disabilities.
“The partnership is intending to use these in their upcoming raffles, so we included a few cheeky boozy options which included beers with crisps, gin with biscuits and port with cheese!” said Allan.
Find out more about how you can help support the charities here:
https://www.waltonlea.org.uk/donate/
https://www.roomattheinn.org.uk/giving

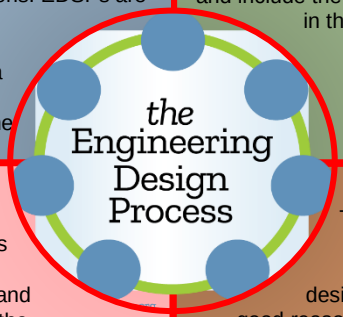
SAFE BY DESIGN – EDSPs

WHAT?

The **Engineering Design Safety Principles** (EDSPs) are Sellafield Ltd’s established relevant good practices for engineering design. They were developed over 20 years ago and promote the delivery of safe design solutions. EDSPs are based on the ONR Safety Assessment Principles (SAPs) and are inherent to the development of a safe design which enables a safety case to be produced.
There are 33 EDSPs, these can be found in the SLM linked at the bottom of this poster.

THE REGULATIONS

To meet the legal, regulatory, and contractual requirements, SL Design has established the Engineering Design Requirements (EDRs) which are presented in **SLM 1.02.05** and include the requirement to apply the EDSPs as applicable in the design solution. The requirement to consider the EDSPs is also identified in the Conduct of Engineering Manual (**SLM 1.02.01**).
It is important that designers are aware of requirement for risks to be ALARP and to meet this requirement where it applies.



IT CAN HAPPEN HERE

The EDSPs are high level principles that must be followed. Failure to implement the principles can lead to significant re-work to satisfy Regulators. This can cause significant delays and permission to operate will not be granted until the regulator is convinced that the correct process has been followed and that people will be kept safe - following the EDSPs demonstrates this.
The SAPs and EDSPs can change in response to events, for example these were updated after LFE from Fukushima.

WHAT CAN DESIGNERS DO?

The SL arrangements identify that the PEM (or equivalent) is responsible for ensuring that the EDSPs are considered during design. During design the EDSPs should be met unless there is a good reason for not doing so. Intelligent application of the EDSPs will help ensure that good engineering practices are employed in the design and will support arguments that the design is ALARP. It is important that EDSPs are understood as principles and not a set of mandatory instructions. In some designs, some of the principles may not be applicable.

Links
SLM 1.02.06 - Sellafield Ltd Manual or Plan Template (ssa-intra.net)

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