Design Services Alliance
Sellafield Ltd AXIOM Progressive Alliance

NEWS BULLETIN January 2022

A regular update on DSA projects and people

DSA helps create new containment wall to boost SNM resilience

An integrated DSA project team is playing a key role in delivering a key hazard reduction project to improve the containment boundary in Special Nuclear Materials.

A detailed requirements capture exercise, stakeholder reviews and optioneering process identified a solution to mitigate hazards posed by shortfalls with the existing containment, including poorly sealed areas vulnerable to accidental impacts, lack of substantiation against over depressions, and no performance as a nuclear fire boundary.

The preferred solution was to install a British Gypsum Shaftwall system comprising of a studwork frame with layered boards, containing engineered ventilation in-bleeds to maintain differential pressure on the existing C5 boundary. The new boundary would control access into the "interspace" between the new and existing boundaries, for continued monitoring and maintenance.

The new system and its installation will meet all the specified functional and safety performance requirements, while taking into consideration the constraints of working in a legacy building, including installation, maintenance and repair, building ventilation fluctuations, hidden services and hazards and floor loading limitations. Coordination with and facilitation of current and future decommissioning activities was also a key consideration.

The new containment boundary makes a significant contribution to radiological safety, and recognising that on-site functional testing was not ALARP, a test rig was built at Jacobs' Newton House engineering development facility at Birchwood Park.

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A section of the new containment wall

Financial update

At end of period 9	
DSA spend during 2021/22	£79.7m
Cashable benefits	£1,235,677
Non-cashable benefits	£2,506,649
Schedule benefits	28.4 months

Health and safety

Hours without a lost-time incident	
AXIOM	7,735,587
Progressive	6,393,254
Total	14,128,841

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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.

Mike is recognised for his role in mitigating BEP project risks

The DSA's Mike Silver has been recognised for his key role in the Box Encapsulation Plant (BEP) project.

As Sellafield Ltd's Mechanical Intelligent Customer for Area 200 – Waste Treatment Cell, he is responsible for assuring the design deliverables being produced by the BEP Project Team.

A Cavendish Nuclear employee, Mike has been instrumental in the ongoing mitigation of one of BEP's most significant external risks.

He manages technical interfaces between the BEP Project Team and the 3m³ Box Design Project to ensure the box design is compatible with the mechanical handling plant and equipment that will be operated in the BEP facility, which will play a vital role in the safe processing and storage of waste retrieved from various legacy ponds and silos around the Sellafield site.

Failure to mitigate this external risk would have a major impact on design, manufacture and

construction work critical paths.

Although the external risk has not been retired, Mike's work has significantly reduced its impact.

Ron Johnson, who is pictured presenting Mike with a certificate of commendation, said: "Mike's work emphasises the huge importance of attention to detail, effective communication between all parties and a collaborative approach to technical engineering projects."

Containment wall project on track for final commissioning

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The rig replicated plant conditions and was able to successfully demonstrate that the chosen system would meet functional and safety performance requirements. Impact testing was carried out along with pressurisation and leak tests.

The rig was also important for early engagement of site construction and contractor to help develop and optimise installation methodologies in a facility which has many constraints and sensitive areas and equipment. The rig and was also used demonstrate the proposed British Gypsum Shaftwall product and gain stakeholder buy-in and confidence.

Currently the project has installed over 95% of the 150 metres of containment wall and in doing so has already delivered key plant benefits and hazard reduction by:

- Removal of 150m² of asbestos.
- Removal of redundant mechanical and electrical services.
- Relocation of significant amounts of lighting, instruments and area monitors
- Isolation of first floor C5 area from ground floor C5 area to prevent spread of contamination.
- Extract fan turn down from 40m³/s to 32m³/s, reducing the pressure and potential fatigue on the existing containment boundary.

Dave Ashton, Project Engineering Manager, said: "Although it may sound like a civil engineering task, this is a ventilation-led project as it ultimately mitigates the risk of loss of ventilation extract and back migration of activity through the current containment boundary, and it will mean significant changes in how the ventilation system is managed.

"The project has benefited from the strong relationship built up within the Integrated Project team, which has included DSA resources from Mott MacDonald, Assystem and Jacobs; plant system engineering, plant operations, construction, safety case team, commissioning, human factors, and the programme team. OneAim has also been key to delivering the project so far.

"The team has had to overcome some considerable challenges, as the building kept on throwing up more and more surprises, but we are on track for a final big push for commissioning and formal risk retirement of an ONR Level 1 issue, and as such the project has been delivered under the scrutiny of the regulator, with whom we have built and maintained an good and open relationship."

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Next steps for the DSA: more collaboration and added value

During the past 10 years, the DSA has firmly established itself as part of Sellafield Ltd's procurement infrastructure.
Originally envisaged as a way to ensure the availability of engineering design and safety case capability, it is now much more than that.
The DSA recently asked its customers to name what they valued most about the input from alliance partners. The answers were:
•Innovative design tools and digital techniques;
•Solutions which are new to the nuclear sector;
•Challenge that leads to removal or reframing of scope as a result of reach back, learning from experience (LFE) and contracting with specialist supply chain companies;
•Early engagement and involvement in studies and enabling works;
•Prompt mobilisation.
As they embark on Tranche 3, the third five-year DSA contract period which runs until 2027, the alliance partners are seeking to do more of these key value-adding activities.
Alliance Designed Delivery, a new contractual mechanism, has now been extended to a number of live projects, allowing the DSA more involvement with manufacturers, constructors, operators and commissioners from studies onwards.
This early engagement of the DSA in the project lifecycle is a key enabler for creating value and more opportunities to apply LFE and reachback from DSA subject matter experts and specialist suppliers.
The DSA is poised to play a major part in Sellafield Ltd's ongoing commitment to certification to ISO 44001, the international standard for collaborative business relationship management.
Jan Lancaster, DSA Culture and Behaviours Lead, said: "In Tranche 3 we are building on ten years of working collaboratively and further embedding the principles of ISO 44001."
A Joint Relationship Management Plan has been developed that will enable the DSA create added value through:
•Continuous investment in the relationship with greater transparency and trust;
•DSA Leaders working collaboratively as One Team;
•Joint delivery strategies developed with Programmes and Projects;
•Focus on added-value outcomes and delivered benefits;
•Clearer expectations and continuous onboarding;
•Valuing, supporting and developing DSA people.

Expo event will demonstrate DSA's digital reach back

A new date has been set for an event that will give an insight into how the DSA's digital technology and innovation is transforming project delivery and decommissioning.
DSA Reach Back – Digital will be held on Wednesday March 30, from 10am to 3pm in the Spark Plug suite at The Engine Rooms (pictured), Birchwood Park, Warrington.
It was originally scheduled for January but had to be postponed because of Covid restrictions.
DSA partners from AXIOM and Progressive will be demonstrating reach back capabilities which can deliver increased efficiency and savings.
"Continuous innovation is key to the ongoing success of DSA delivery," said Assystem's Chris Murphy. "Whilst innovation isn't all about technology or digital, it clearly has a significant part to play. At this event we hope to show some

exciting new developments for potential use across Sellafield."
Topics covered will include spatial characterisation, digital design and information management, data science, digital twins, and virtual and augmented reality.
For more details, see the advertisement on page 7 or email Chris.Murphy@axiomjv.com.

Design team's award helps the homeless in Warrington

An award won by DSA designers on the SIXEP Continuity Plant (SCP) project has benefited homeless and vulnerable people in and around Warrington.

The SCP Design Team undertook an extensive sustainability review, aligning design decisions with the United Nations Sustainable Development Goals. These socio-enviro-economic benefits included the use of innovative solutions to reduce the quantities of construction materials required, to minimize energy consumption and water use, and to eliminate the emission of harmful gases.

As an AXIOM partner, Jacobs has recognised these accomplishments by naming the design team as one of the winners of the Jacobs' Chief Financial Officer's (CFO) Sustainable Solution Award, which celebrates brilliant sustainability practice.

Sponsored by Jacobs' Chief Financial Officer, Kevin Berryman, the CFO Sustainable Solution Award recognises individuals, project efforts or office teams who strive to embed sustainability fully into the solutions delivered for Jacobs' clients, their employees and communities.

The judges expressed their delight that "great efforts have been undertaken by the team to ensure future-proofing of structures, capturing many benefits and re-utilisation of existing assets."

The award provides $1,000 (approximately £730), for donation to a charity of the team's choice.

The money has been donated to Room at the Inn & Y Project, a registered charity which provides daytime services to homeless and vulnerable people, helping them to get over a difficult time in their lives and find a better future.

As well as food and a place to go, the charity gives them access to a telephone or the internet to help with job applications and other tasks.

The charity's Susan Blyth said: "Imagine if tonight you were faced with the prospect of losing your home and having to choose what you could take with you that would fit into one carrier bag. This is pretty much the situation that many people who come to us for support have been faced with."

The charity is dependent on both monetary donations and gifts of items such as food and hygiene products. Susan asked us to thank many colleagues who contributed items via the donation boxes placed around Hinton House before Christmas.

Pictured below (from left): Simon Nunnery (Jacobs' SCP Senior Engineering Manager), Gavin Wickham (Jacobs' Operations Director), Dave Coates (Jacobs' SCP Project Manager), and Susan Blythe (Room at the Inn Site Manager)

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Jan is on course to help DSA invest in collaborative working

Jan Lancaster, DSA Culture and Behaviours Lead (pictured), has joined the Institute of Collaborative Working after completing on the ICW Collaborative Working Leaders Course at Warwick University, funded by Babcock International, parent company of Cavendish Nuclear.

The vast majority of Jan's work to support the DSA has been closely linked to improving collaboration and the timing of the course, for which Jan received a commendation, could not have been better.

Since the DSA received confirmation of Tranche 3, commencing in February 2022, it has committed to achieving recognition under ISO 44001 Collaborative Working, as part of Sellafield Ltd's certification programme. This is subject to formal approval by the Collaborative Working Steering Group at their next meeting in March.

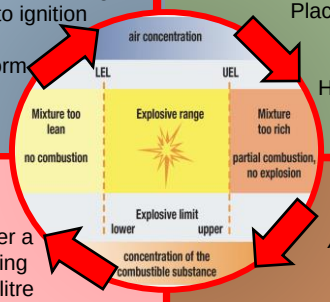
Working in accordance with the standard brings a number of benefits, including continuous development of the relationship and trust, and enhanced delivery performance through clarifying objectives, expectations and interests of all parties.

Anyone interested in further developing collaboration within a specific relationship or finding out more about the DSA's ISO 44001 journey, can contact Jan for support and guidance on 07807 814724 or by email at jan.x.lancaster@sellafieldsites.com.

SAFE BY DESIGN – DSEAR REFRESHER

WHAT?

DSEAR stands for the **Dangerous Substances and Explosive Atmospheres Regulations**. DSEAR regulates the management of risk from hazardous substances. A good **hazard management strategy** is essential before thinking about area classification. Attention often turns to ignition source controls despite this being towards the bottom of the hierarchy of controls. This may form part of the hazard management strategy but should not be considered before management of the flammable substances themselves.



THE REGULATIONS

There are **16** DSEAR regulations in total. Applicable to designers are Regulations **5-11**:

Risk Assessment **(5)**
Elimination or reduction of risk from dangerous substances **(6)**
Places where explosive atmospheres may occur **(7)**
Accidents, incidents and emergencies **(8)**
Information, instruction and training **(9)**
Hazardous contents of containers and pipes **(10)**
Duty of co-ordination **(11)**

IT CAN HAPPEN HERE

A manufacturer of high-pressure gas cylinders was ordered to pay over £800k in damages after a worker was killed by shrapnel ejected from testing equipment. The worker was leak testing 1,500-litre cylinders when one exploded. HSE found that before the test, a corrosion inhibitor had been placed into the cylinders. This contaminated the leak test manifold during venting and was subjected to enough pressure inside the manifold to ignite. Although a DSEAR assessment had been completed, changes to the process were not captured.

WHAT CAN DESIGNERS DO?

Remember the hierarchy of controls
A hazard management strategy/basis of safety must be in place before considering zoning
Engage with SMEs and SQEP individuals
Most DSEAR knowledge is contained within individuals, start with process capability
Start the risk assessment early in a project
DSEAR should be considered from concept, not as an add-on
Look for LFE and best practice
Look for similar installations where assessments already exist

Links

Capability Guidance

Key Contacts & Information

Author: Gareth Davies & Tom Hart
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£125,000 snatched from under the gallows by DSA review

Sellafield Ltd went out to tender via the Decommissioning Delivery Partnership for the removal of the Reactor 1 gallows hoist at Calder Hall Nuclear Power Station, which is part of the enabling works for the project to remove the station's heat exchangers.

The tender price was based on a method of removal which required a birdcage scaffold to be designed and built with the gallows hoist being size reduced and dismantled in situ.

However, after the finance team reviewed the proposed costings and flagged the need for further review, a DSA-led intelligent customer team examined the methodology and techniques.

The DSA team concluded that the proposed approach was excessively elaborate.

It suggested a simpler technique of using excavator attachments to cut up the gallows and remove it as waste off site. The new approach avoided unnecessary design work for the birdcage scaffold and made work safer for the operators because it avoided the need for hot cutting and manual lifting while working on a scaffold platform.

The changes avoided costs of £125,400, with 75% of this attributed to the DSA IC team and the remainder to Sellafield Ltd Commercial.

A significant reduction in the time required for design and construction enabled schedule savings of two months.

Project Engineering Manager Kevin Tumilty said: "The DSA integrated team came up with an alternative approach which introduced safety improvements and efficiencies, leading to increased stakeholder confidence in the proposed solution."

The gallows hoist at Calder Hall Reactor 1

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Design Services Alliance

Sellafield Ltd AXIOM Progressive ALLIANCE

DSA DIGITAL EXPO

MARCH 30 | 10 - 3

SPARK PLUG SUITE @ THE ENGINE ROOMS
BIRCHWOOD PARK, WA3 6YN

Partly driven by the 2016 UK Government mandate for BIM, over recent years, a range of new digital technologies have been successfully introduced into projects in many market sectors.

The UK Government Nuclear Sector Deal is intended to drive significant efficiencies and savings within project delivery and decommissioning by embracing digital technologies.
The DSA will therefore be providing a demonstration of some our wider partner capabilities in the Digital arena, showing innovative ways of working with technology to deliver value for Sellafield.

Continuous innovation is key to the ongoing success of DSA delivery for Sellafield. Whilst innovation isn't all about technology or digital, it clearly has a significant part to play. At this event we will be demonstrating work ongoing elsewhere, for potential use across Sellafield.

ZONE 1 SPATIAL CHARACTERISATION

ZONE 2 DIGITAL DESIGN + INFORMATION MANAGEMENT

ZONE 3 DATA SCIENCE

ZONE 4 DIGITAL TWIN

ZONE 5 VIRTUAL & AUGMENTED REALITY

FOR FURTHER INFORMATION PLEASE CONTACT CHRIS.MURPHY@AXIOMJV.COM

Jacobs cavendish nuclear assystem MOTT MACDONALD AECOM

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