esri UK

Case study

Making multi-million pound savings in a 100-year mission

Sellafield

The Challenge

- Manage hundreds of projects over a 100-year period, safely and efficiently
- Enhance emergency response systems

The Benefits

- Effective implementation of a 100-year plan
- £2.5 million annual cost savings
- Proven readiness for emergency situations
- Improved collaboration and safety on site

Decommissioning and remediating the Sellafield nuclear facility is an incredibly complex and hazardous project that is expected to take 100 years to complete. Esri's ArcGIS platform is being used to help plan hundreds of simultaneous and adjacent programmes of work, improve the efficiency and safety of employees and deliver millions of pounds in cost savings.

The Challenge

The scale of the challenge for Sellafield Ltd cannot be underestimated. The organisation has been tasked with decommissioning and remediating the Sellafield nuclear site, which currently comprises 1400 buildings, 250 nuclear facilities, over 330 km of utility pipes and drains, a 55 km road and rail network and 20 km of overhead cables. The target completion date for this mammoth undertaking is 2120, so the organisation needs to plan a schedule of highly complex and hazardous programmes of work, in close proximity to each other, over the next 100 years. In order to treat and safely store legacy nuclear inventory, Sellafield Ltd needs to construct at least 50 new buildings, decommission and demolish existing facilities and move hazardous materials safely around the site, while minimising costs.

In 2010, the nuclear accident at the Fukushima Daiichi nuclear plant in Japan, caused by an earthquake and subsequent tsunami, focused global attention on the need not only for exceptionally robust safety measures, but also for effective emergency response systems. Sellafield Ltd recognised that if it expanded its use of geographic information systems (GIS) for day-to-day operations, it could, in tandem, make better data and systems available to support rapid decision making in the event of an emergency.

The Solution

Through an Enterprise License Agreement with Esri UK, Sellafield Ltd used Esri's ArcGIS platform to create a web mapping platform, called Sellafield Maps, that makes GIS capabilities and spatial data accessible to 11,000 employees and thousands of supply chain resources. Sellafield Maps comprises hundreds of data layers showing everything from the locations of 5,000 manholes and the routes of underground gas pipes to the nearest bus stops. The service typically receives 20,000 hits and handles 100,000 feature searches every month. "Sellafield Maps is now part of the daily toolkit that people use to do their jobs," says Richard McGrath, Spatial Development Lead at Sellafield Ltd.

In addition, Sellafield Ltd has used ArcGIS Portal to develop more than fifty specialist GIS apps that deliver specific GIS functionality and data for certain groups. One such app has been developed to support emergency responses and is displayed on a large screen in the control room. The app mimics the company's prior use of whiteboards, allowing employees to see the incident location, incorporate live weather reports and wind direction, to enable a plume to be automatically drawn once a radioactive release point has been identified. The app can also be accessed remotely by managers working off site, alongside government teams and emergency services if necessary.

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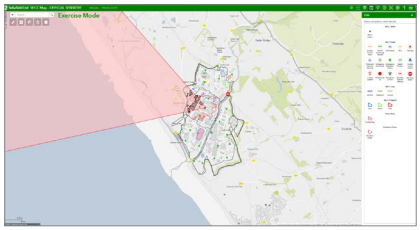
>
> Richard McGrath, Spatial Development Lead, Sellafield Ltd



The Emergency Control Room app at Sellafield Ltd

Sellafield Maps ‘Data Wheel’ – a way of categorising and promoting simple access to one-source-of-truth data that is unaffected by organisational and business-structure change

The Solution (cont.)

Both Sellafield Maps and ArcGIS Portal use a ‘Data Wheel’, a centralised library with nine data categories for storing and accessing all data in a standard way, so that when departments are inevitably reorganised during the next 100 years, the way that data is stored can remain consistent. “We received support from consultants in Esri UK’s Professional Services group, who help us push the boundaries of Esri software,” says McGrath. “The consultants show us how to do things differently and build apps more efficiently to reduce server load and deliver additional services for users.”

The Benefits

Effective implementation of a century-long plan

The Sellafield site has a finite land resource and is heavily congested. ArcGIS plays a pivotal role in helping Sellafield Ltd to identify the optimum sites for new buildings, based on the locations of utilities and adjacent facilities, and subsurface ground conditions and visualise what the site will look like at different points in time, as old buildings are demolished and new structures take their place. “Over the next 20 years alone, Sellafield Ltd will be investing £13.5 billion in new facilities for the storage and treatment of nuclear waste,” McGrath says. “ArcGIS helps us to ensure we put specialist facilities in the right places, to reduce costs in the building phase and ensure they can be operated efficiently during their lifetime.”

£2.5 million in efficiency savings

The use of Sellafield Maps and ArcGIS Portal apps allows teams right across the business to work more efficiently. On average, Sellafield Ltd estimates that employees save fifteen minutes every time they consult an ArcGIS map or app. Even taking into account the ArcGIS licence, IT hardware and staff time, these time savings equate to an annual cost saving of £2.5 million pounds, year after year.

Readiness for any future emergency

Sellafield Ltd is confident that its extended use of ArcGIS puts it in a better position to respond quickly to future emergencies. Following a recent failure in part of the site steam system, the emergency control room used the ArcGIS app to quickly access relevant information, understand the implications of the incident, explore different scenarios and make rapid decisions. “It is reassuring to have a proven ArcGIS emergency app in place that we know we could rely on if a serious incident were to occur,” McGrath says.

Improved collaboration and safety on site

Several teams at Sellafield Ltd, including the utilities teams, make extensive use of ArcGIS Portal apps to share information with employees working in different zones across the 262-hectare site. “ArcGIS improves clarity for employees working at locations right across Sellafield,” McGrath says. “It supports collaboration between teams and improves safety, by ensuring everyone knows what is happening nearby, when new projects are being kicked off and where hazards are located.”

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