

RADIATE | Modernising nuclear safety case assessment

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PRODUCT SCREENSHOT

Product overview

Riskaware works with the UK National Nuclear Laboratory (UKNNL) to modernise legacy nuclear safety case modelling capabilities. RADIATE is a nuclear safety case toolbox providing an up-to-date framework to inform decision-making for multiple safety cases.

With nuclear energy and the use of co-generation sites set to play a key role in addressing climate change, we need to consider how the proximity of nuclear plants to other energy production sites will impact the risk environment.

Modern safety cases increasingly call for combined radiological and chemical hazard analysis. That analysis depends on tools that are reliable and demonstrably validated.

Use cases and outcomes

- › Analyse major accidents, risks and human impact for aerial safety demonstrations
- › Reduce area of Emergency Planning Zones
- › Gain tighter margins on Safety Cases
- › Locate Advanced Modular Reactors (AMRs)
- › Rapid and simple implementation, and scenario model results within minutes

RADIATE Capabilities

UKNNL has historically used computer modelling techniques which are based upon the National Radiological Protection Board (NRPB) Model for Short and Medium Range Dispersion of Radionuclides Released to the Atmosphere, NRPB-R91, and Near Wake Modelling, NRPB-R157.

These models are often limited in range and some of the computation models are no longer available or are deployed on outdated operating systems. They are essentially black boxes and unsuitable for new safety cases.

Working closely with UKNNL, we have modernised and integrated these algorithms within a simple web-hosted tool, available to the nuclear industry community as a set of common models.

RADIATE assesses risks posed by exposure to airborne radioactive material by estimating a person's expected dose. It also accounts for long-term exposure due to nuclides absorbed by the body.

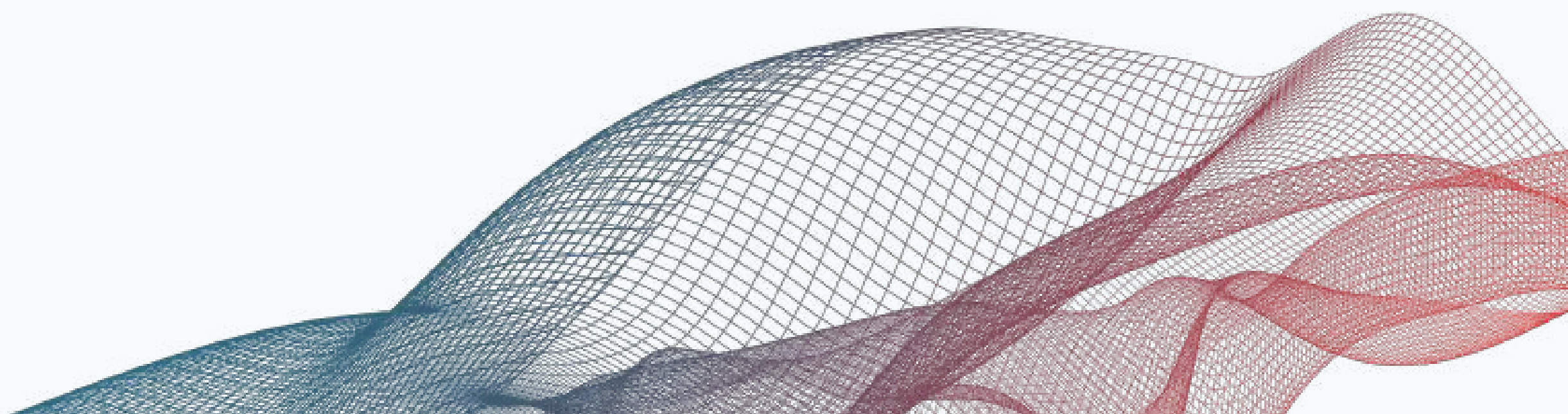
RADIATE has been in service since July 2025 and is undergoing pilot trials with UKNNL. Verification comprised 50 tests against available HAZCALC data and checked, approved hand calculations, with all comparable results in alignment. Nuclide data is taken from ICRP Publication 119, Compendium of Dose Coefficients based on ICRP Publication 60.

RADIATE currently contains three models: a near-field model that replicates the legacy HAZCALC model, an aerial dose model that assesses effects on the public, and a long-range model for distances beyond 100m based on R91 equations.

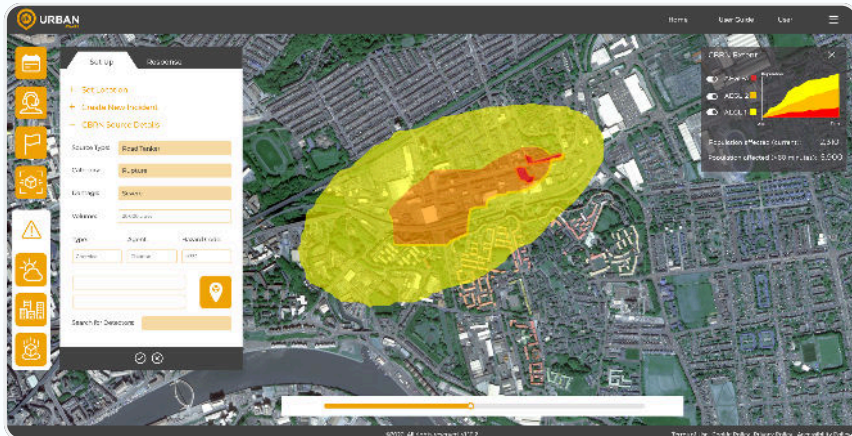
The Enhancement Roadmap

RADIATE already models beyond the site boundary using the Urban Dispersion Model (UDM). Development continues to integrate these models with UrbanAware, our CBRN hazard assessment and decision support tool, adding 3D radiological modelling alongside chemical modelling capabilities to support complex analysis, visualisation and advanced planning. This will include aerial inhalation, ground shine radiation and cloud shine assessment capabilities.

As subject matter experts, UKNNL will verify and validate the advanced capabilities and evidence the reliability. As nuclear sites move closer to urban populations, these capabilities will be essential for understanding and mitigating the impact of nuclear incidents on surrounding urban populations.

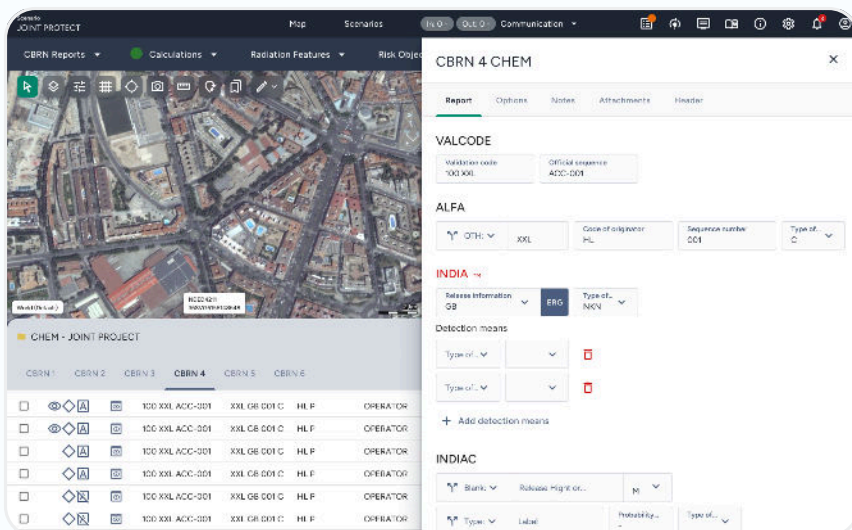


Related products



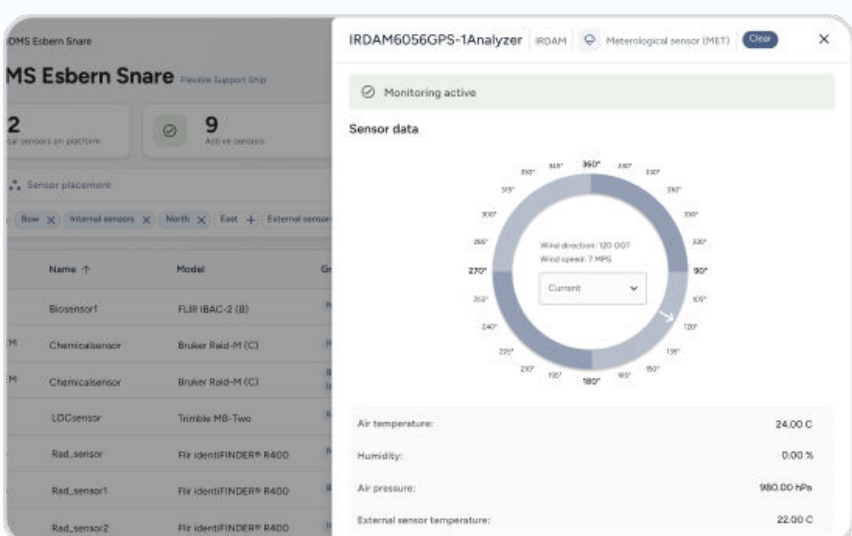
UrbanAware

- Optimise real-time decision making with superior situational awareness. UrbanAware is a next-generation CBRN Information Management (IM) tool for the military, first responders, and local government.
- Its aim is to provide lifesaving situational awareness and decision support in the context of urban CBRN and HazMat incidents, helping stakeholders to develop more effective response processes.



CBRN-Analysis NG

- CBRN-Analysis is an advanced, off-the-shelf software-based CBRN Knowledge Management Application that includes Hazard Prediction and Warning and Reporting.
- Configurable and modular, it provides commanders with rapid and accurate information to increase their CBRN situational awareness within an area where CBRN materials may be used.
- CBRN-Analysis effectively supports and enhances risk-management in all phases of an operation, both in the planning and pre-deployment phase, in-theatre and in the post-conflict or recovery phase.



SCIM®

- • SCIM® stands for "Sensor Connectivity Information Management" and is a software hub that provides sensor connectivity to multiple sensor types and brands in a single and effective display.
- The system allows collection of sensor data and formatting of that data into standard CBRN messaging for further dissemination via built-in communication applications. The software enables the capture of sensor data that can then be transmitted for further investigation. SCIM® is futureproofed as it allows any sensor or instrument to be replaced or added as technology advances.

More information can be found at: www.bruhn-newtech.com.

