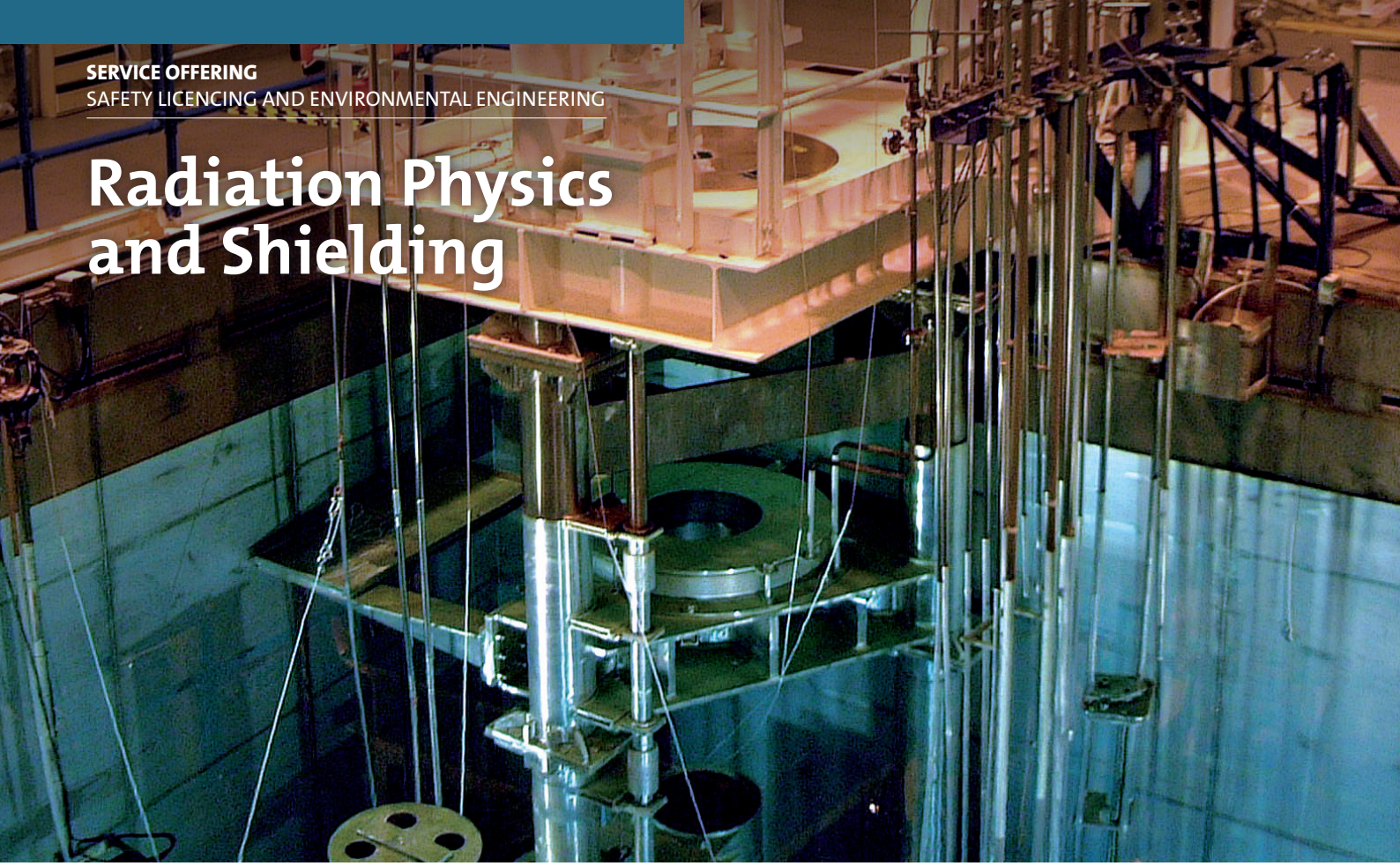
SERVICE OFFERING
SAFETY LICENCING AND ENVIRONMENTAL ENGINEERING

Radiation Physics and Shielding



Rolls-Royce has over 50 years of experience in the field of radiation physics and shielding. Over this time we have developed unrivalled technical capability covering a wide range of specialisms.

The radiation physics and shielding team provides responsive and focused services for the technical support to reactor designers and operators to meet their design, licensing and operational challenges. Rolls-Royce has undertaken reactor shield design, the determination of radiological doserates in normal and faulted conditions, radioactive inventory analysis, fluence analysis, radiation damage to materials, nuclear heating and instrumentation response. Our experience includes assessments of refuelling processes and equipment, decommissioning dose assessments, decontamination facilities, used fuel and radioactive material transport flasks and reactor plant support facilities.

Rolls-Royce is skilled in the application and use of both internationally recognised, and Rolls-Royce developed, radiological assessment codes.

Supporting capabilities

Rolls-Royce offers a wide range of services which include:

- Radiological shield design (reactor plant, reactor plant support facilities and transport flasks)
- Determination of radiological doserates and doserate contours
- ALARP assessments and reviews
- Reactor Pressure Vessel (RPV) fluence analysis and measurement
- Assessment of radiation damage to materials
- Nuclear heating assessment
- Assessment of nuclear instrumentation response
- Radionuclide inventory analysis
- Assessment of reactor plant contamination source terms and waste arisings
- Normal operation dose assessments
- Fault conditions radiological consequence assessments
- Peer review of radiological assessments
- Radiation transport and material activation theoretical methods development
- Gamma spectroscopy
- Radiation measurements
- Safety Case production

Radiation Physics and Shielding

Applications:

Our extensive experience encompasses support for both the UK civil nuclear market and the UK Submarine fleet. Our experience with codes such as MCBEND, MCNP, RANKERN, WIMS and Rolls-Royce developed in house radiation physics codes, allows us to assess shield design and perform criticality calculations for a wide range of applications.

We have a wide range of experience in supporting the civil nuclear market, from initial scoping calculations through to decommissioning activities. Examples include neutron streaming through penetrations, neutron embrittlement of steel pressure vessels, designing shield walls around decommissioning facilities and assessing doses to operators when performing manual handling activities on irradiated components, With a wide range of experience supporting current civil reactor designs, emerging exposure in support of the New Build renaissance and over 50 years experience in supporting the UK nuclear Submarine fleet, Rolls-Royce is ideally placed to offer the full range of radiation physics to support small projects or large safety case work.

Our ongoing experience with naval nuclear Submarines has provided us with an unrivalled understanding of the safety case and licensing process followed by the Office for Nuclear Regulation. The role that radiological protection and radiation physics plays in production of the plant safety justification and design substantiation documents is well understood and can be applied in many different areas of the UK civil nuclear marketplace.

Experience/references

Rolls-Royce has nearly 250 years of combined experience in both the civil and defence nuclear marketplace.

0005/SO/15

Rolls-Royce Power Engineering plc
PO Box 2000, Derby DE21 7BD, England

Tel: +44 (0)1332 632688
Fax: +44 (0)1332 622936
Email: nuclearsolutions@rolls-royce.com

www.rolls-royce.com