

Professional CV	JAMES H. CASEY
Key qualifications:	BEng (2:1), Aerospace Engineering, The University of Sheffield, 2017
Key experience:	Studied Mechanical Properties of Structural Materials, Materials Selection and Fracture Mechanics, and Dynamics of Aerospace Structures and Machines

Work Experience

Graduate Engineer September 2019 – Present

Engineering Analysis Services Limited (EASL)

Projects completed with the company include;

MAT Assessment of Dungeness B Tailpipes

Minimum acceptable thickness (MAT) calculations of pipework in several heating systems in Dungeness B Power Station. These MATs were calculated as the result of various different material failure mechanisms, including plastic collapse, fatigue and fracture. Involved using literature to derive material properties at the assessed temperature and running calculation spreadsheets for several different loadcases. Keeping a clear record is imperative in making a defence for the selection of inputs.

CFD Analysis of a Pipework Bypass

A computational fluid dynamics (CFD) analysis of pipework system with a bypass configuration. This task offered the opportunity to form a professional relationship with a brand new client and to explore a branch of engineering that is relatively novel to the company – fluid mechanics. Involved writing up a case study detailing the job description, completed an advice note to summarise our findings to the client, and an internal presentation within the company to demonstrate the capabilities of CFD.

Mesh study of an RPV inlet nozzle

A mesh sensitivity study completed to aid in the defect tolerance assessment for a reactor pressure vessel (RPV) inlet nozzle. Through the use of finite element analysis, stresses arising from pressure and thermal transient loading can be accurately derived, based on input data provided. To that end a conclusive study into the dependency of thermal stresses generated on mesh density allowed a full understanding of the minimum requirements to accurately capture the heat transfer of the nozzle.

HRA 12-Monthly Hot Pipework Support Surveys

Several engineering reports written up on the findings of several audits of Hot Pipework support surveys conducted by Doosan at both Hartlepool reactors. Involved several site visits to Hartlepool power station where comprehensive inspections of specified steam and feed system pipework supports in the hot condition were undertaken. Compared present data to historical data and included suggestions for necessary remedial works.

Implications of New Advice on Materials Data for Existing Structural Integrity Assessments

A report completed on the implications of new advice on materials data for existing structural integrity assessments for the headers at Dungeness B Power Station. The report summarised the sources of materials data that are used in existing assessments of the various header components, and identified areas where certain issues could challenge the continued adequacy of these assessments. The study has considered the gas-side of the reheater inlet, reheater outlet and superheater outlet headers, and the steam-side of the reheater inlet and outlet headers.

Fusion Blanket Literature Review

A literature review of fusion blanket design on behalf of UKAEA. This review developed the UKAEA-EASL knowledge and understanding of fusion blankets, with a particular focus on capturing the wide range of conceptual designs from across the world. The review was based upon scientific papers produced by a variety of institutions and it considered key aspects of blanket design, such as materials selection, coatings, remote handling and blanket lifetime.

Background Experience

Mechanical Engineering

- Knowledge of calculating the bending stresses experienced by a beam and hand calculations of second moments of area.
- Group university project with the aim to design a bridge structure at the lightest weight possible to carry a specified load. Constructed from plywood and drawn up & analysed through the use of Finite Element Analysis software.
- An individual, final year project titled 'Study of a Future Supersonic Wing Concept.' Involved writing a thesis and presenting the findings to top engineering lecturers at the university. The project required the extensive use of Computational Fluid Dynamics software program ANSYS Fluent.

Materials Science

- Various courses completed in the discipline including the selection and processing of aerospace materials and common phenomena experienced by engineering materials such as creep & fatigue.