Professional CV **JAMES BAGLEY**

Key Qualifications: MEng (Hons) (2:1) Mechanical Engineering, University of Manchester Institute of Science and Technology, 2005
CEng, MIMechE

Key experience: 15 years' experience working in the nuclear industry for a variety of clients including EDF, UKAEA, Sellafield, Rolls-Royce, Urenco & BAE Systems. Experience in analysis, assessment and engineering substantiation of piping and mechanical components and systems. Mechanical system specification and design, feasibility studies, site walk down and commissioning projects. Experience in use of PSA5, CAESAR II, ABAQUS, FEMAP & AutoCAD.

Suitably Qualified Experienced Personnel (SQEP) Qualifications are:
Role code 0: Classic Strength of materials
Role code 1: Design code & piping assessments
Role code 4: Pipework analysis

---

**Senior Mechanical Engineer & Fusion Team Lead** December 2018 – Present
*Engineering Analysis Services Limited (EASL)*

Senior Mechanical Engineer working as author, verifier and independent technical specialist for various structural integrity assessments across the nuclear industry. Projects included:

- Defect Tolerance Assessment of the Reactor Coolant Pump Flywheel produced on behalf of General Nuclear System Limited, for the Generic Design Assessment (GDA) of the UK HPR1000 reactor design.
- Dungeness B - Reassessment of Limiting Length of an Axial Through-Wall Defect Local to the Main Steam Warming Line Branch.
- For UK HPR1000 GDA, a number of welds and non-weld locations are assessed for defect tolerance. One of which is the Reactor Coolant Pump (RCP) flywheel, which is the subject of this report.
- Intelligent customer surveillance review of Hinkley Point C Balance of Plant pipework analysis and assessment.
- Lead Engineer for a literature review of fusion blanket design on behalf of UKAEA. This review developed the UKAEA-EASL knowledge and understanding of fusion blanket design, with a particular focus on capturing the wide range of concept designs that have been developed across the world. The review was based upon scientific papers produced by a variety of institutions and considered some of the key issues associated with blanket design such as materials selection, coatings, integration, remote handling and blanket lifetime. A report into molten salts was also produced as part of the review.
- Lead Engineer for a project researching and documenting material properties for a range of materials at cryogenic temperatures for use in fusion projects on behalf of UKAEA.
- Hinkley Decay Heat Pipework – Update of Pipe stress Analysis to address identified shortcomings in existing assessment of static loadings
- Hartlepool Power Station - Station Dump Condenser Pipe Stress Analysis and Support Load Assessment for Valve and Line Stop Installation
- Structural assessment and fatigue analysis of autoclave vessel to ASME VIII Div 2.
- Independent review of nuclear new build heat exchanger stress analysis to RCC-M, Section I, Subsection C

**Senior Mechanical Engineer** September 2016 – December 2018
*Urenco UK, Capenhurst*

Senior Mechanical Engineer, functioning as Design Authority Intelligent Customer, working across a number of site substantiation and implementation projects for the UK enrichment plant facilities. Responsible for delivering engineering substantiation reports, performing plant walk downs, peer review of substantiation

reports and organising testing/commissioning work in support of substantiation. Projects included:

- Acceptance of ESRs (Engineering Substation Reports) on behalf of Urenco, operating as Design Authority Intelligent Customer on A3 and E22 COSER (Continued Operation Safety & Environment Report) projects.
- Authoring ESRs in support of Urenco's E23 uranium enrichment facility COSER. The reports covered mechanical and piping equipment. The work involved retrieving and reviewing relevant information, making assessments against relevant codes and standards, reviewing maintenance and operational records, performing site walk downs and assessing the designs against safety function under specified performance requirements.
- A3 Criticality Safety Improvement project: testing/commissioning of Control Valves, involving developing a programme of commissioning to validate the control valve and mechanical stop sizing to achieve specified performance requirements. Liaise with suppliers to have radiographic and ultrasonic NDT undertaken on vessels to make a case for adherence to safety case requirements.

**Senior Mechanical Engineer** July 2012 – September 2016
*Amec Foster Wheeler (Wood)*

Mechanical Engineer within the Mechanical & Piping Team working across a number of projects for a variety of nuclear industry clients. Projects covered mechanical & piping assessments and analysis, supporting existing plant and new build design projects. Projects included:

- Responsible Engineer for a pipe stress analysis project supporting EDF's Hartlepool Nuclear Power Station. The job involved undertaking pipe stress analysis, using PSA5 to BS EN 13480 and proposing piping design changes to facilitate the installation of a replacement strainer in the ECW (Essential Cooling Water) system.
- Sizewell B Snubber Removal Assessment for EDF: Performed assessment to support the undertaking of maintenance upon Sizewell B snubbers during a refuelling outage.
- Peer review and project support to EDFs Sizewell B Radwaste sump liner replacement project. Contributed to the project through undertaking design reviews, responding to technical queries, reviewing pipe stress analysis and reviewing design drawings.
- Authoring DSR (Design Substantiation Report) and DSJ (Design Safety Justification) reports for BAES. The reports substantiate the nuclear safety functional requirements and conventional safety functions placed upon nuclear submarine systems. This also includes an assessment of the system's design functional performance. In the construct of the reports knowledge of the design and the Safety Case was utilised. Understanding of the underpinning codes, standards and substantive calculations was paramount in justifying the design from a safety perspective.
- Mechanical and piping design optioneering works supporting the development of a new build nuclear process facility at Rolls-Royce, Raynesway. The works involved researching plant design and material options and industry best practice to develop design solutions for a challenging process environment.
- Site condition survey and substantiation assessment of the Rolls-Royce Neptune low energy naval research reactor. I was responsible for under the mechanical/piping discipline included the reactor system, moderator system, active waste system and radiation calibration facility.
- Delivered the piping LTPR (Long Terms Periodic Review) for a Sellafield Processing Plant. This involved assessing the various piping systems against key ONR substantiation considerations. The LTPR involved retrieving and reviewing the relevant information, performing site walk downs and raising shortfalls and potential improvements where necessary. I worked with the client to review and categorise the shortfalls, these were then documented in a discipline specific report. Contributed to ALARP review.

**Mechanical Engineer** March 2009 – July 2012
*Enrichment Technology Company UK*

Mechanical Engineer working across a number of international enrichment plant nuclear process projects. Responsible for delivering design documentation and feasibility studies, undertaking supporting calculations, generating equipment specifications and reviewing supplier procedures. The role also included attending design reviews and HAZOPS, undertaking development and qualification packages of work, mentoring graduates and performing technical presentations. Projects included:

- Modelling of feed system utilisation calculations. Undertook calculations to determine the requirements for the feed system in a centrifuge enrichment plant. Findings were then documented and P&IDs and process descriptions generated.
- Plant module sizing feasibility study for an enrichment plant. Undertook a feasibility study to investigate the potential plant design options for the customer, reporting the flexibility of the plant. The study also included the options in terms of the economy of plant operation.
- Redesign of contingency dump system. Upon request of the customer there was a departure from the standard contingency dump system design. This change request resulted in a complete review of the system and redesign of the process system and control.

**Graduate Engineer** January 2006 – March 2009
*Engineering Analysis Services Limited (EASL)*

Graduate Engineer undertaking various analyses and assessments on behalf of EDF and other clients. Responsibility for originating engineering technical reports detailing analyses of plant operational data, pipe stress analyses and hanger surveys, FE modelling, stress analyses and damage assessment of plant components. Projects included:

- Modelling pipework systems at Sizewell B and Hunterston B Power Stations using PSA5 pipe stress software and assessing them to ASMEIII sub-section NC and BS806:1993 including seismic analysis. Assessments involved pipework redesign proposals to reduce excessive stresses in key locations.
- Modelling and creep/fatigue assessment of Hunterston/Hinkley nuclear power station boilers. Responsible for generating a global 3D model of the boiler internals and analysis using ABAQUS finite element software. Analyses of temperature transients were undertaken and assessment performed using R5 Vol 2/3 creep-fatigue initiation procedure to assess the damage to key components. The output of these assessments was used to support the safety case for the continued operation of the reactors.
- Conducting a number of pipework hanger surveys at various UK nuclear power stations. Work involved generating pipework system registers for a number of large bore steam lines. Site visits were then undertaken to perform a complete pipeline walk down including a survey of hanger position and condition.