Ben Randerson, CEng

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Chartered Engineer and Software Developer with 13+ years in the offshore energy industry.

Proven track record leading digital transformation initiatives, building scalable engineering software, and delivering efficiency gains across global teams.

Education and Certifications

Chartered Member of the Institution of Mechanical Engineers (IMechE) | Since Nov 2017

MEng (Hons), Mechanical Engineering with Management (1st Class) | The University of Edinburgh | Jun 2012

Professional Experience

Digital Lead - Rigid Pipeline & Geotech | TechnipFMC, Remote | Jan 2022 - Present

- Drive digital transformation and shape long-term digital strategy for engineering tooling across global subsea business
- Develop and maintain ecosystem of Python-based tools that underpin company-wide pipeline and geotechnical design activities
- **FastPipe:** Subsea pipeline mechanical design tool (180+ users) with 34+ benchmarked calculation routines, automated reporting, and FastAPI REST API for integration with external systems. Reduced engineering hours by up to 75% and key enabler of Rigid Transformative Industrialisation Programme
- **FastPSI:** Streamlines pipe-soil interaction workflows and addresses critical interface between geotechnical and pipeline teams. DNV-RP-F114 and Safebuck models, parametric and Monte Carlo treatment of uncertainty, and Streamlit-based web interface
- **MathCaddie & Excelerator:** Execution and parameterisation frameworks for Mathcad Prime and Excel workbooks to improve flexibility and reusability of existing tools
- Define, implement, and manage software practices, platforms, and automated workflows for hosting engineering tools, including version control (Git), code quality checks (Ruff), testing (pytest), package management (uv), CI/CD pipelines (GitHub Actions), and documentation hosting
- Promote software adoption and digital culture through webinars to 200+ employees and regular internal newsletter articles
- Supervise and mentor 20+ engineers through one-on-one coaching, code reviews, and developer onboarding documentation. Maintain central knowledge wiki and Developers Teams channel

Senior Discipline Engineer (Pipeline Software Development) | TechnipFMC, Remote | Jun 2020 - Jan 2022

- Led development of FastPipe (wrote 90% of codebase), used by 40+ engineers across 20+ projects
- Digitalised Excel/Mathcad design tools, leveraged Python scientific stack (NumPy, Pandas, SciPy, Numba, Matplotlib), and accelerated upheaval buckling reliability Monte Carlo assessments by up to 90%
- Identified report writing as a design pain point, secured management buy-in, and developed library to automatically generate MS Word reports for direct client delivery
- Wrote Python library to extract and compare data from 3 online marine weather REST APIs, handling OAuth2 authentication
- Developed containerised (Docker) web dashboards using Dash and Streamlit, deployed as Azure App Services for interactive visualisation
- Built command-line interfaces for engineering tools using Click and Typer frameworks
- Established collaboration framework with Azure DevOps for Git version control, product management, and CI/CD pipelines hosting Python packages via private Artifacts feed
- Introduced modern software engineering best practices, including Agile, automated testing (unit/integration/TDD), and object-oriented/functional programming
- Delivered tool demonstrations to Vice President level and training sessions for engineering teams

Senior Pipeline Software Development Engineer | Genesis Oil & Gas, Remote | Jun 2019 - Jun 2020

Genesis Oil & Gas merged with TechnipFMC in June 2020.

- Developed containerised Flask REST API to serve design calculations and interface with external web-based frontend, including Click-based command-line interface
- Built web-based frontend using Dash to visualise pipeline design analysis results
- Wrote Python library to interface with Rescale computing platform API, enabling pipeline on-bottom roughness finite element analysis on the cloud
- Led Agile project management for cross-discipline team, introducing SCRUM methodology, including sprint planning, code reviews, retrospectives, and build automation

Senior Pipeline Engineer (Digital Lead) | Wood, Aberdeen | Jul 2018 - Jun 2019

- Served as digital focal point for Subsea and Export Systems in Aberdeen
- Agile Product Owner for VIVSim (in-house free span fatigue analysis software)
- Performed mechanical design of subsea pipelines to BSI, DNVGL and ASME industry standards, including wall thickness, out-of-straightness, on-bottom stability, free span fatigue assessment, and expansion
- Conducted Finite Element Analyses (FS2000 and Ansys) for upheaval buckling and tie-in spool stress design
- Built Python tools and packages to perform calculations and interface with existing systems
- Mentored and supervised junior engineers

Pipeline Engineer | Wood, Aberdeen | Oct 2017 - Jul 2018

- Multi-bore jumper design including wall thickness to ASME B31.8/B31.3, on-bottom stability to PD 8010-2, dropped object assessment to DNVGL-RP-F107, polymer saddle specification and material take-off
- Gas import pipeline design, including on-bottom stability, upheaval buckling and associated cost estimation
- Developed features for in-house project management software (XTRAC) using C# (ASP.NET) and JavaScript, collaborated with Ireland-based development team within an Agile environment
- Developed Excel-based Failure Mode Criticality Assessment and quantitative Risk-Based Inspection tool to optimise inspection program for all controls equipment within a major subsea development
- Produced scopes of work and invitation to tender packages

Project Engineer (Secondment) | Apache North Sea, Aberdeen | Jan 2016 - Oct 2017

Selected for highly competitive secondment within Pipelines, Topsides Projects and Flowlines teams:

- Job Responsible Engineer for Forties Charlie Flare Knock-Out Drum Instrumentation project
- Client Representative and Apache single point of contact on board vessel for several offshore campaigns
- Managed delivery of drilling repair orders for Beryl platforms, minimising drilling schedule impact
- Performed integrity reviews of an export pipeline to confirm readiness for use for emergency offload
- Planning/initiation of flowline projects; cost estimating, scope of work preparation and vendor liaison
- Revised Pipeline Integrity Management System (PIMS) to demonstrate legislative compliance
- Monte Carlo simulation for oil field development cost estimation and holistic decommissioning cost model

Engineer | Wood Group, Aberdeen | Sep 2012 - Jan 2016

Graduate Development Programme, rotated through multiple disciplines, including:

- **Subsea Pipelines:** Mechanical design; tie-in spool stress analysis; flange design; analytical and finite element modelling of composite pipelines; cost estimates; scheduling; component specification
- **Structural Design:** Designed bespoke clamped caisson guide arrangements through the entire project lifecycle; prepared probabilistic risk assessments to determine subsea protection requirements
- **Renewables:** Excel-based cost modelling and scheduling for offshore wind farm construction