

EPSRC UK Nuclear Academics Meeting

Presentation on behalf of Amec Foster Wheeler

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Content of Presentation

- ▶ Brief Overview of Amec Foster Wheeler
- ▶ Areas of Research and Development
- ▶ National High Temperature Testing Laboratory
- ▶ LEA with EDF Energy
- ▶ Links with Universities

Overview of Amec Foster Wheeler

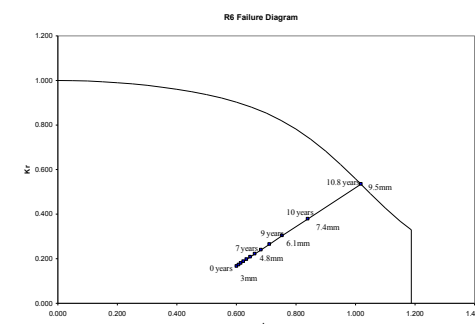
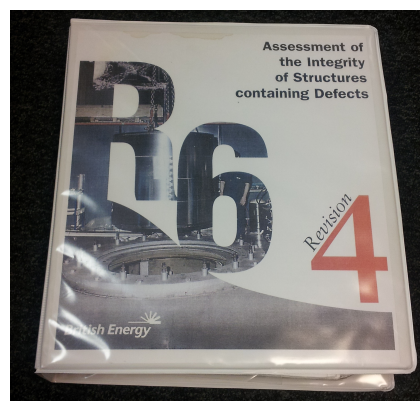
- ▶ Primarily Oil and Gas (approx. 40,000 people)
- ▶ Clean Energy – Primarily nuclear (approx. 2,500 people)
 - ▶ Types of work
 - ▶ Engineering Solutions
 - ▶ Regulatory Support
 - ▶ Engineering Consultancy
 - ▶ Research and Development (including European Projects)



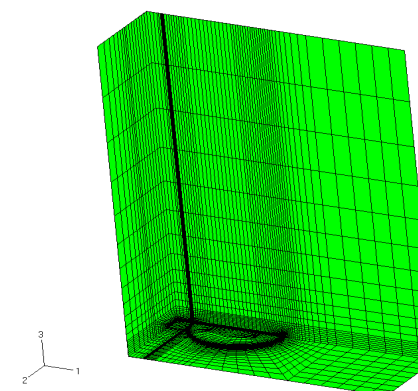
amec
foster
wheeler

Areas of Research (1)

Developing R5 and R6 structural integrity assessment procedures

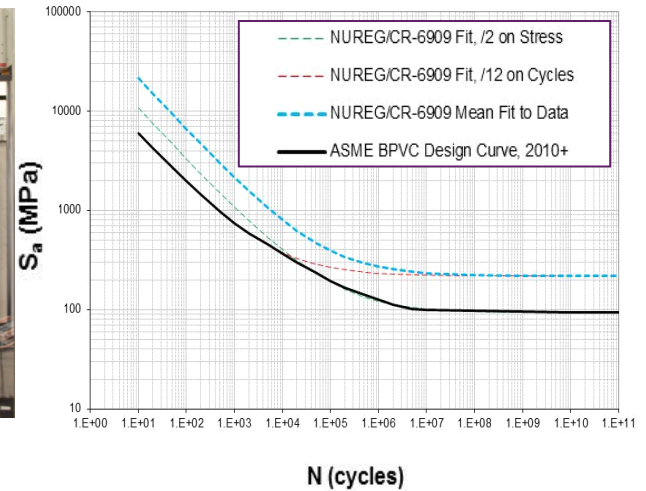
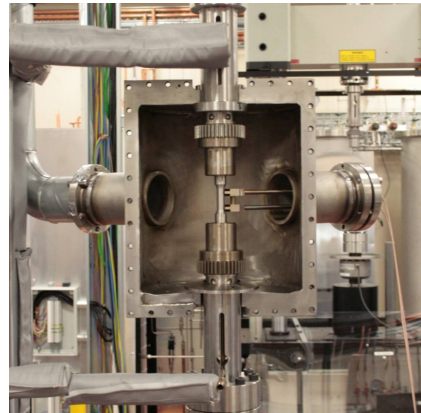


Other fracture mechanics related research

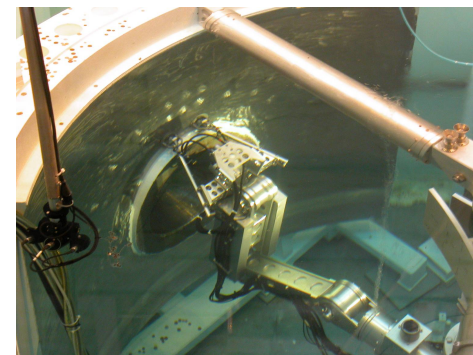
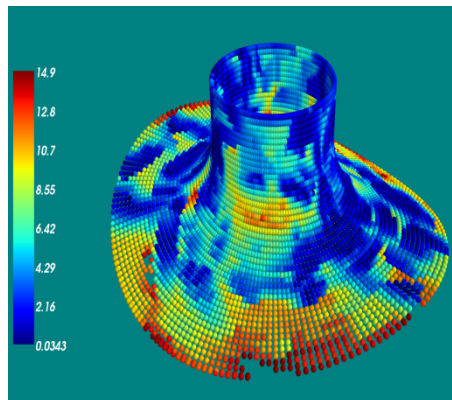


Areas of Research (2)

High Temperature Water Corrosion
Environmental Fatigue
Stress Corrosion Cracking
Hydrogen Assisted Cracking



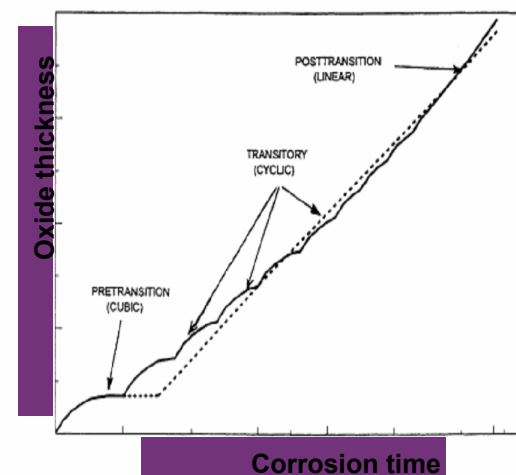
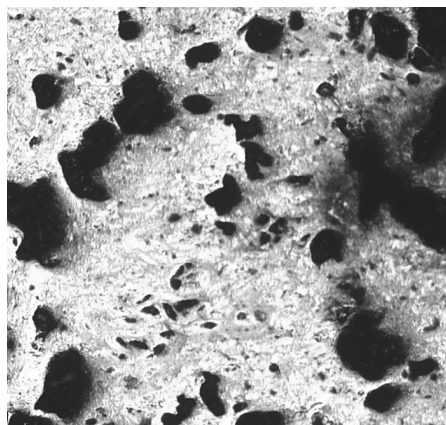
Non Destructive Examination



Areas of Research (3)

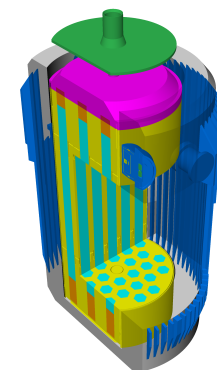
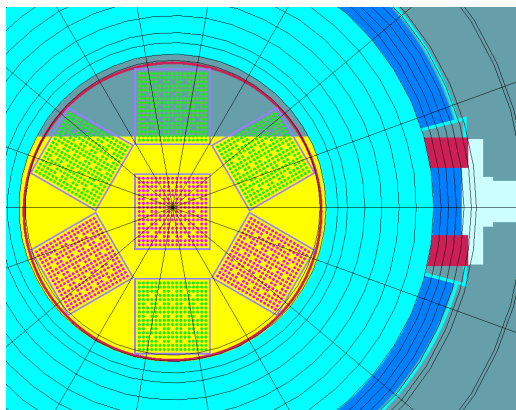
Core Materials

- Graphite
- Zircaloy Corrosion



Nuclear Physics (ANSWERS Software)

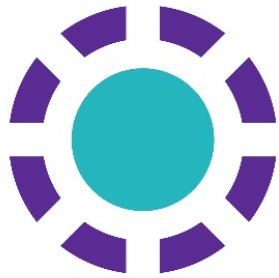
- Reactor Physics and Nuclide Inventory
- Radioactive Shielding and Dosimetry
- Nuclear Critical Safety



Amec Foster Wheeler Research Facilities

Nationally leading lab for conducting research into material performance under non-active plant-typical conditions

- Able to support testing in PWR, BWR, AGR and Candu environments using 50 autoclaves for water and gas testing
- Several testing innovations that are world-leading
 - Heat flux testing, compressive load crack growth, thermo-mechanical fatigue in high temperature water, etc.
 - Operation of the Wythenshawe boiler rig test facility – full scale simulation of boiler in AGR.



High Temperature Facility Alliance



<http://www.htfalliance.com>

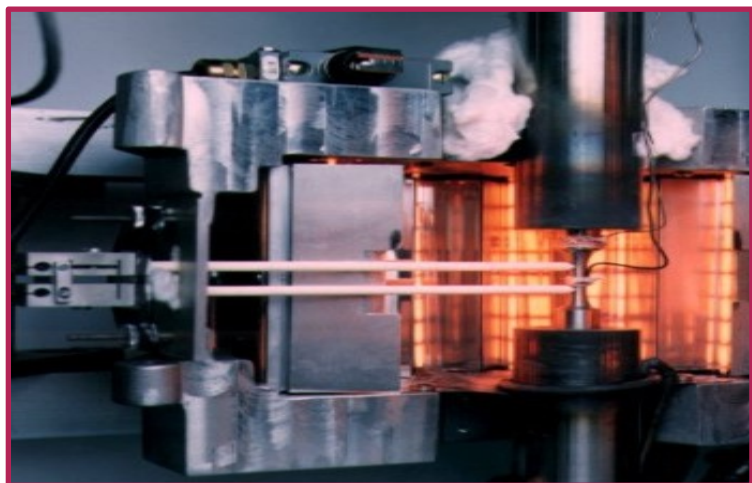
High Temperature Facility Alliance

Project Objectives

- ▶ Establish a high temperature materials R&D facility that builds on reputation of existing lab but is open access for the wider research community
- ▶ Develop and deliver an exploitation plan that helps the UK play a leading role in advanced reactor technology

DECC (BEIS) grant

- ▶ £2m to set up facility – year 1
- ▶ Construction is complete. Launch event 21 September 2016
- ▶ Technical conference on High Temperature Materials in Manchester



<http://www.htfalliance.com>

Operational Mode – Open Access Lab

Technology hotel – lab space to test high temperature materials performance

Lab fund charge based on rig-year occupancy.

Staff made available to supervise safe operation of facilities

Amec FW host, research projects that are conducted by universities or other

organisations

Part of National Nuclear User Facilities

Facilities

Office, Internet, Remote data access, restaurant, meeting room, etc

Supports creep, fatigue, corrosion etc in high temperature (1000C) gaseous environments and liquid metal environments

Technical Governance

AMEC FW, CCFE, EDF Energy, NIRAB, NNL,

Bristol, Manchester, Imperial, Open, Oxford Universities

Identify and engage with funders, provides technical direction and ensures compliance with NIRAB priorities and national policy.

Prospective Use of Facility

Generation IV reactor programmes

EPSRC funded projects to universities

Innovate UK call to corporations, SMEs and universities

JRIC or NIRAB programmes

Reactor Development projects

Small Modular Reactors

U-Battery initiative

AGR fleet support

Non-nuclear high temperature applications (turbines / fossil plant)



LEA with EDF Energy

Amec Foster Wheeler have a Lifetime Enterprise Agreement with EDF Energy to permit long term strategic investment in resources, facilities and R&D.

Includes issues such as

- 1. Innovation in R&D leading to more long term solutions to underlying technical challenges**
- 2. Investment in facilities (such as boiler rig)**
- 3. Effective linking with EDF suppliers (such as universities)**

Links with Universities

Main University Links:

Manchester
Bristol
Imperial
Oxford
Liverpool
Open University

Sponsoring of PhDs and EngDocs:

Over the past 10 years, Amec Foster Wheeler has sponsored various PhD and Eng Doc students mainly at Manchester Imperial and Bristol and mainly on structural integrity and materials aspects. Several past students have been recruited to the company.