

The Royal Academy
of Engineering

Research Chairs

Structural Integrity Life Assessment

Co-funded by British Energy Generation Ltd.

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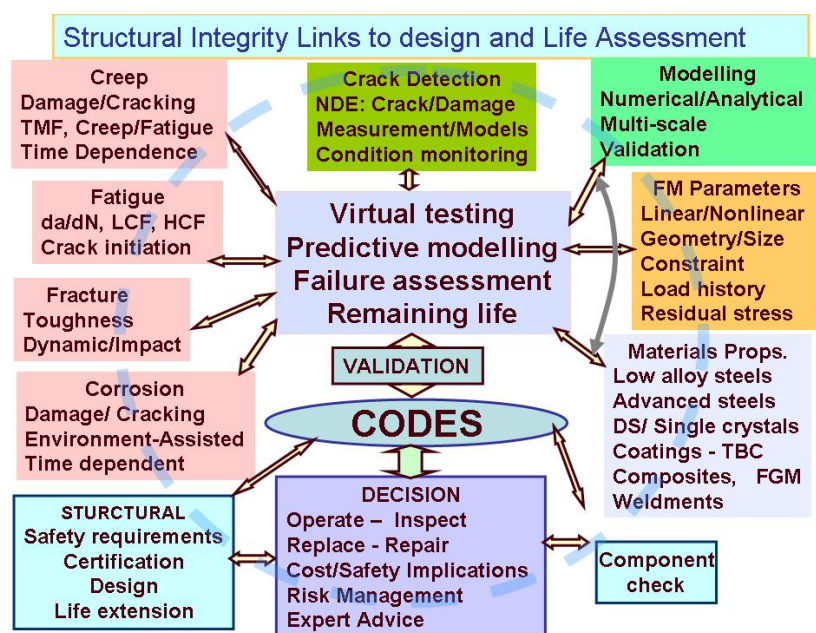
Main objectives of the 'Structural Integrity' group at Imperial College

- Develop, Integrate, validate and apply predictive multi-disciplinary methodologies associated with fracture and damage mechanics based failure of components
- Extend collaboration at Imperial College with other departments such as Materials, Aeronautics and combine with the Nuclear Energy and the NDE groups
- Development and extension of fracture and damage based predictive life assessment Codes

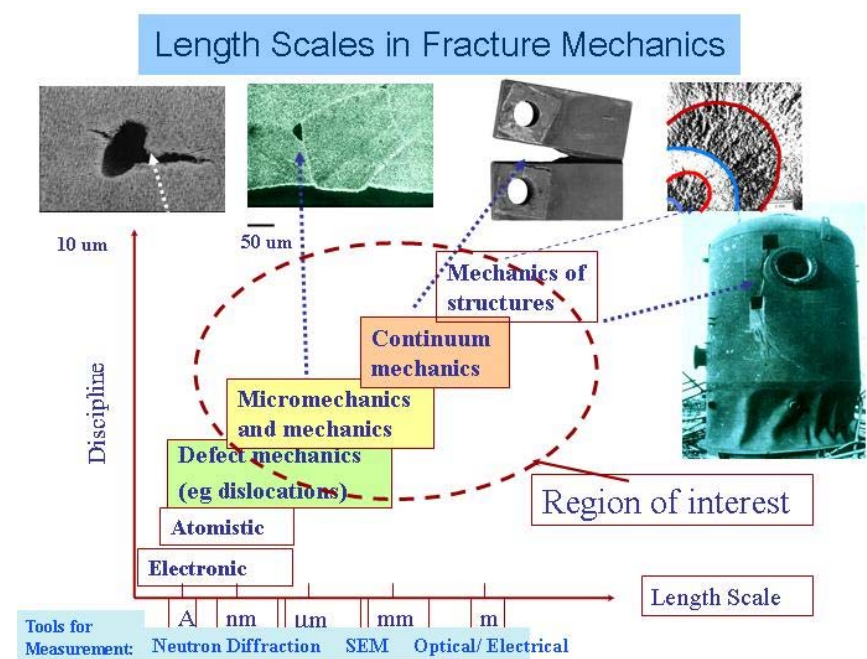
Ongoing projects in collaboration with: British Energy, Rolls Royce, EPSRC, EU, Tecnip Ltd,

- ◆ Effects of residual stress on weldments
- ◆ Propagation of short cracks in single crystals
- ◆ Lifetime assessment of abradable coatings
- ◆ Multi-scale modelling of recrystallization
- ◆ Modelling/Testing Thermal Barrier Coatings

- ◆ Weld induced distortion of thin-walled, steel structures
- ◆ Constraint and residual stress in components
- ◆ Development of pipe reeling fracture methodology
- ◆ Thermo-mechanical properties of weldments
- ◆ Creep/Fatigue of weldments



Schematic of multi-disciplinary 'Structural Integrity' approach



Schematic of length scales needed for modelling crack under different mechanisms

Future outlook: Good progress in developing fundamental and applied research in fracture based Structural Integrity from a multidisciplinary perspective