

# Preface

The first international conference on the management of ageing processes in graphite reactor cores was held during 28<sup>th</sup>-30<sup>th</sup> November at the University of Cardiff, United Kingdom. The conference represented the gathering of the most eminent specialists in the field from around the world. The issues associated with polygranular graphite as a moderator have remained prominent in the forefront of nuclear energy since on December 2<sup>nd</sup> 1942, when Enrico Fermi initiated the first self-sustaining nuclear chain reaction. It is astounding to think that the pile of graphite blocks, known CP-1, in a squash court at the University of Chicago would mark the start of an amazing story in which many scientists and engineers would devote their life's work.

The United Kingdom has a number of gas-cooled, graphite-moderated nuclear reactors that are either nearing the end of their generating life, seeking life extension, or in the latter period of their design lives. As the graphite components of the reactor cores cannot be replaced, it is important to ensure that effective ageing-management strategies are in place to secure safe and reliable operation to the end of their generating life. This text, resulting from the proceedings, represents the accumulation of knowledge and presents the latest understanding and understanding in field that will remain significant for years to come in which graphite moderated reactors will remain centre stage in reactor technology, particularly Generation IV designs. The conference and this text had the objective of placing the next generation of scientists and engineers in good stead to improve the performance of the new generation of civil nuclear reactors and to share the UK experience with the rest of the world. I believe that the conference was very successful in achieving its aims particularly in the following topics:

- The understanding of the effects of irradiation on the properties and behaviour of graphite components
- Materials properties test procedures
- Modelling of graphite behaviour
- Brick and component behaviour
- Component integrity assessment methodologies
- Whole core modelling
- Inspection techniques
- Monitoring core condition
- Ageing-management strategies
- Regulatory requirements

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