**Enterprise Projects – Creating a New University Institute**

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**Abstract**

This keynote presentation will include a discussion of how the Institute of Shock Physics was established at Imperial College London in the United Kingdom. The Institute was formed in order to undertake fundamental physics experiments that will yield new insights into the science of shockwaves and to increase UK capabilities in the field by attracting and training new researchers from the sciences and engineering disciplines. The endeavour to establish the Institute can be considered as an enterprise project, which are strategic initiatives that enhance the academic mission of the institution through developing new research and education capabilities.

Structured management processes were used to develop the Institute, including use of various engineering management and systems engineering practices and in particular as part of the development of a major high pressure experimental research facility.[[1]](#footnote-1) The engineering design of the experimental facility included the use of failure mode and effects analysis (FMEA).[[2]](#footnote-2) This involved analysis of potential failure modes and resultant effects within the system through classification of the severity, probability, and detection of potential failure modes. FMEA analysis was undertaken at three stages in the project, including the design, delivery & installation, and operations stages. The FMEA process was supported by development of a system architecture for operation of the high pressure facility based on the SADT (structured analysis and design technique) technique.[[3]](#footnote-3)

Technical risks were also mitigated though a two-stage testing protocol, involving factory acceptance testing (FAT) at the manufacturer’s engineering facilities followed by the eventual site acceptance testing (SAT) at the university site. Completion of the project to develop the experimental facility allowed doctoral level research to be conducted as part of the Institute’s research programme.

**Keywords**

Research Institute; Enterprise Project; Experimental Research Facility; Engineering Management; Systems Engineering; FMEA

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2. Philbin, SP (2009) Investigation of a Systems-Based Design and Planning Approach to a Facilities Development Project*, Proceedings of* the *IEEE International Conference on Industrial Engineering and Engineering Management*, Hong Kong (pp. 608-612), IEEE. [↑](#footnote-ref-2)
3. Philbin, SP (2010) Developing an Integrated Approach to System Safety Engineering, *Engineering Management Journal*, Vol. 22, Issue 2, pp. 56-67. [↑](#footnote-ref-3)