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Safety, risk and reliability management

Many of these accidents could have been prevented with greater attention to safety and reliability in the design, construction and maintenance processes. Additionally, the growing technical complexity of large engineering projects and the public concern regarding their safety and reliability have aroused great interest in the development and application of safety assessment procedures.

The objectives of this research on engineering safety risk and reliability management are to:

1. Develop and apply more rational and sustainable safety, reliability and decision-making techniques and methods to facilitate safety and reliability analysis so that safety and reliability aspects can be taken into account in engineering design, construction and maintenance processes.
2. Develop the advanced procedures for minimising risks by improved design aspects, construction and maintenance strategies based on safety and reliability assessment. Several workshops have been delivered to transfer the research results to civil, offshore oil & gas, nuclear, transportation, railway, road, bridge and other industries.

This research theme focuses on:

- target risk and reliability
- Safety-cost analysis based decision making
- Life cycle analysis
- Uncertainty analysis
- Safety-critical software assessment
- Dynamic and static finite element analysis, and
- Overall safety case preparation for industry

The research and consultancy activities address:

- Development and application of more rational methods and strategies for designing and maintaining the safety and reliability of infrastructure systems (railways, roads, underground transport facilities, bridges, offshore oil & gas, nuclear etc)
- Form safety and reliability assessment of both rolling stock projects and large scale infrastructure projects
- Computer tools for safety, risk and reliability evaluations
- Safety-cost analysis and maintenance analysis
- Multiple criteria in decision-making (Construction management, design management, project management and project risk management)
- Human error studies (design, construction, maintenance and operation)
- Overall Safety Case preparation for industry

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