Case study

Explosion risk analysis for ITER fusion reactor

CHALLENGE

The €10bn ITER project ranks amongst the most ambitious science endeavours of our generation, aiming to develop self-sustaining power production from nuclear fusion. As part of the safety justification for the building and operation of the fusion device, assurances are required that explosion risks are appropriately understood and managed.

ITER were therefore required to demonstrate that all areas at risk from explosion were correctly identified, and that suitable precautionary steps had been taken to mitigate the risk and effects of explosion. The causes of explosion were not limited to internal processes, and external hazards also needed to be considered, along with secondary consequences of any potential explosion (e.g., fire and missiles).

OUR SOLUTION

Frazer-Nash were appointed to conduct a comprehensive risk analysis of the site in order to provide the French Authorities with independent verification of its safety. As each type of hazard has its own tolerances, we began by identifying clear 'types' of potential hazard. We then identified areas at risk of hazard. Then, using the principles of ALARA (As Low As Reasonably Achievable), we set out to ascertain the extent of explosive atmospheres, and resultant blast pressures they may produce. This enabled us to document manual verification of complex calculation methodologies

BENEFITS

Our comprehensive analysis provided the ITER project with the independent verification necessary to demonstrate the safety of the project. Our report provides assurance to the various stakeholders that extensive measures are in place to reduce the risk of explosion, and mitigate the secondary effects of a potential explosion.

Client
ITER organisation

Business need
Providing validation of measures in place to reduce and mitigate risk of explosion, as required by design authorities.

Why Frazer-Nash?
Extensive nuclear safety expertise, coupled with advanced fluids knowledge, provides for the understanding the potential risks of this emerging technology. We have a sound understanding of the ATEX directives which produce the foundation for explosive atmosphere legislation.

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