

## Case Study | Ichthys Onshore LNG Facility, Australia

Blast, Fire and Thermal Design for Local Equipment Rooms (LER) and Local Instrument Rooms (LIR)

### Scope of Work

The original scope was to design, engineer, manufacture and supply, external blast and fire rated walls, including all associated penetrations and connections for the LER/LIR buildings being supplied to the Ichthys Onshore LNG Facility. The scope of work increased significantly during the execution of the contract to encompass doors and major areas of design support, especially for detailed thermal studies/analyses.

### Client Requirements

In 2013 Mech-Tool Engineering Ltd (MTE) was awarded a design, engineering and supply contract for the fire rated and fire and blast rated walls for the (26-off) LER & LIR modules. The Client required MTE to review the existing specifications and design fully compliant, free spanning, wall solutions, meeting the exacting material, loading, fire and thermal standards called off by the Ichthys project and the specific Australian national standards and codes.

The designs needed to account for material selection and preservation, significant blast and fire loads and achieve a minimum design life of 25 years all against the Building Code of Australia (BCA).

In addition to the above, the scope has grown considerably with the client also requesting initially design but also supply assistance with entire building thermal performance analysis, doors, internal walls, insulation supply and canopy designs.

### MTE Solution

Based upon the specifications available at contract award, the fire and blast wall designs were quickly developed and optimised to include for robust penetration details, connection interfaces, removable panels and doors. The thermal and fire performance required was specific to the region and therefore re-certification against the Australian Fire Testing Standard AS1530-4:2005 was necessary and achieved.

The overall structural scope of work increased with extended design and engineering resource supplied to deal with project enforced changes to features and penetrations, testing against the Australian Wind Actions Standard AS1170-2:2001 for doors and scope growth into both Internal & External Walls/Canopies.

A major addition to the original MTE design scope that required significant and detailed thermal design to resolve the issues, revolved around the specification of PFP, fire rated insulation and

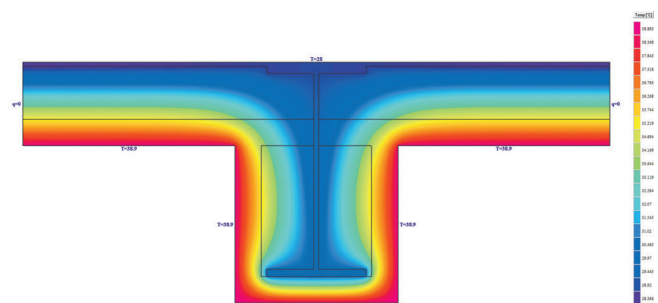


thermal insulation. Several significant design details were resolved in support of the client and specific site features and changes.

MTE ultimately supplied a separate Thermal Design Report where all the individual thermal bridging cases on each specific LER/LIR had been analysed and addressed to ensure the overall building (U-values) were maintained within the specification limits. This embodied a major and detailed scope of thermal analysis – ultimately to the satisfaction of the client.

As this project also encompassed manufacture and supply (the external walls amount to 22,500m<sup>2</sup> with the internal walls providing an additional 6,000m<sup>2</sup>) the client has received considerable site support via the provision of installation supervisors once again providing the complete “cradle to grave” service MTE are proud to offer.

### Heat2Model - Output - Temperature Contour



MTE Design Consultancy are a team of experienced design engineers, project leaders and draughtspersons with skills in all areas of engineering consultancy, conceptual design, layout and detail engineering.

MTE Design Consultancy has developed its own unique programmes and systems to offer a wide range of highly accurate design and cost projection services. These elite tools are the culmination of in-depth experience and knowledge built up over 50 years. They have been independently validated and tested for their reliability in solving thermal, mechanical and structural problems.

Because of our extensive expertise in blast and fire technology we believe our involvement at the design evaluation stage of a project such as Feasibility Studies, FEED and Design for Manufacture including certification will lead to greater optimisation of the engineering alternatives with subsequent weight and cost saving benefits.

MTE Design Consultancy services include:

- Blast report reviews and interpretations
- Stressed skin blast and fire design
- Blast relief studies
- Basis of design and functional specification compilation
- Blast and fire wall design optimisation
  - weight / space reductions
- HVAC / electrical / modularisation optimisation studies
- Thermal / fire / PFP design optimisation

To enquire about MTE Design Consultancy services or to discuss your specific requirements, please contact the sales department:

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