

PROJECT BRIEF

 Seismic Retrofit to Columns of Reinforced Concrete
Cryogenic Tank using the TYFO® Fibrwrap® Composite System

INDIA


 Gujarat, India
June 2001


Following the earthquake of January 2001 in Gujarat, India, a 26,000 m³ capacity reinforced concrete cryogenic tank in a petroleum refinery suffered structural distress. Most of the 181 columns supporting the 49 m diameter tank base slab exhibited shear cracks, particularly near the top 400 mm portion of the columns. A design and as-built drawing analysis revealed that the lateral tie reinforcement spacing in the top portion of the columns far exceeded the code provisions. It was concluded that this was the cause of the structural distress. A retrofit option was sought to remedy the deficiency and a composite solution was put forward by Fyfe Asia Pte Ltd. The TYFO® Fibrwrap® Composite System uses aerospace technology and materials, i.e. carbon/glass/aramid fibres and epoxy composites and works on the concept of wrapping structural members such as columns, beams, slabs and walls to enhance ductility and load carrying capacity of the members.

The TYFO® Fibrwrap Composite System was selected over other composite systems and conventional retrofit techniques as, apart from achieving the design objective, it also addressed other critical operational issues such as no plant shutdown, no hot works, quick completion and non-intrusive operation. The entire Seismic strengthening works was carried out in five weeks.

FYFE Asia Pte Ltd

8 Boon Lay Way, #10-03 Tradehub 21, Singapore 609964

Tel: +65 6898 5248 • **Fax:** +65 6898 5181 • **E-mail:** info@fyfeasia.com • **Web:** www.fyfeasia.com