

## Piping Safety Assessment at Major Chemical Plant

### Background

One of our major clients needed to extend the life of an ailing pipeline which had significant visible corrosion. It was commercially critical for the client to continue running the plant until the next scheduled maintenance period. Our job was to analyse the pipeline in its corroded condition and evaluate its on-going suitability for service.

### The Problem

The line in question carried both toxic liquid and vapour, depending on operating conditions and had a maximum operating temperature of 260 °C. On inspection, the line had thinned from the original 5.5 mm to 2.1 mm at some locations.

The most highly corroded section is shown here:



### Our Solution

We created a 3D model of the entire pipeline, in surface geometry, taking care to ensure it extended far enough to implement correct boundary conditions on the most highly corroded section. The line had numerous sliding and hanging supports.

The reduced thicknesses were accounted for by varying the shell definition of the mesh at the corresponding locations.

The line was analysed for self-weight, pressure and thermal loads. The results suggested that the line must be taken out of service as quickly as possible as allowable stresses were being exceeded. The cause was excessive thermal expansion, and over constraint.

The client was understandably not keen to stop production immediately and to change supports during operation was not an option. We were, however, able to work with the Operations Team to define a working condition where the applied temperature was limited. This in turn reduced the stress, thus allowing operation to continue until the next planned plant shut-down.

### Piping Safety - A Critical Service

This was a good example of a Safety Assessment we are able to perform for industrial-scale piping plants, crucially providing a detailed, practical recommendations that can keep your plant running safer and longer.

Although not required in this case, we can also provide an assessment report for Health and Safety Officers, providing plant owners with robust back-up to our recommendations.

### To get in touch

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