



Case study

Improving the safety of chassis structures

THE CHALLENGE

It is well known that the process of welding can cause plate structures to distort beyond their allowable tolerances, but industry had yet to define a strategy to deal with this threat.

OUR SOLUTION

Frazer-Nash have developed a '*weld residual stress analysis*' modelling tool which enables Rail Engineers to simulate stresses within the chassis structures, to forecast problems before they occur. The 'sense and respond' features of the software then prescribe appropriate measures to counteract the effects of the heat, and prevent the structure from distorting.

To illustrate, an engineer from a major rail network attempted to modify an existing chassis frame by welding an additional structure to it. However, the client's initial fabrications showed that the distortion was unacceptably high and as a result, the frames were no longer usable and had to be scrapped.

By modelling the welding process used on the chassis structure, Frazer-Nash was able to examine the distortion that had taken place. In this case, the side panels had twisted to deflect outwards, resulting in a structure that was too wide for use. However, further simulation then showed that a revised welding pattern could have prevented the buckling and saved the frames from being scrapped.

BENEFITS

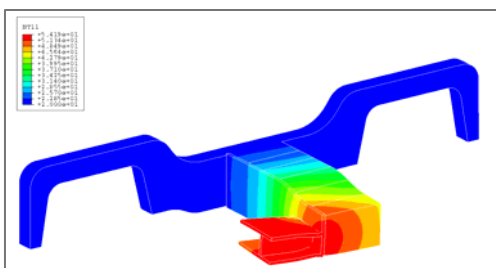
Although this model was originally developed to meet high integrity requirements of the nuclear industry, it is now regarded as the world's most accurate and advanced welding simulation tools, and has since been applied to many different industries.

By deploying advanced technologies like this, Frazer-Nash can help our clients to significantly reduce risk, by identifying and resolving problems long before the manufacturing stage is reached, thus improving efficiency and saving time and money.

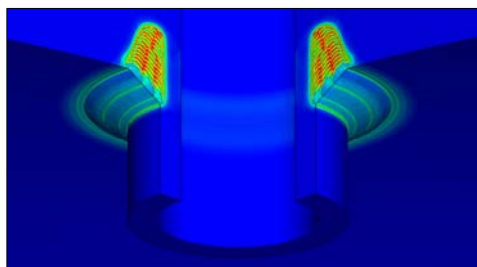
Client
Various

Business need
Improved understanding of the welding process to produce more effective and longer lasting welds

Why Frazer-Nash?
Frazer-Nash have developed the world's most accurate and advanced welding simulation tools



Residual stress distribution pattern applied to rail chassis



The same technique applied to a multi-pass weld on a nuclear reactor vessel

Find out more
To find out more about our work and how we can add value to your business visit our website.

