

https://dspace.org/

Evaluation of pipe stub flange behaviour during hydrostatic pressure testing

Asumani, Oscar

2008-05-16T07:19:21Z
http://hdl.handle.net/10539/4833

Downloaded from a DSpace repository. https://dspace.org/

ABSTRACT

An evaluation of glass reinforced plastic pipe stub-flange behaviour during hydrostatic pressure testing is presented. Similar flanges made according to different manufacturing methods were analysed. Linear static analysis using MSC Patran / Nastran was performed to predict the critically loaded regions subjected to high stress concentrations. These regions were used for experimental strain gauge locations. Hydrostatic testing designed according to BS 5480 and ASTM F 37 was performed on assembled flange joints to initiate both leakage and ultimate material failure. Experimental strain results were compared to finite element numerical results at the selected locations. Fibre dominated failure characterised by cracks extending through the stub and matrix dominated failure characterised by interlaminar debonding were noticed. The need for further work analyzing GRP flanges subject to mechanical load and taking into account induced residual thermal stress effects is suggested.