



Slumping of Pipework Systems

Case study

The inspection guidelines for the survey of pipework system supports on UK nuclear power plants requires the comprehensive inspection of all the steam and feed system pipework supports at statutory outages. This is carried out in three separate stages; on load prior to (pre-outage hot), off load during (outage cold) and following return to service (post-outage hot).

The problem

Following the EASL pre-outage hot condition survey of the constant effort pipe supports on the main steam system (MSS) and hot reheat system (HTS), it was concluded that there was slumping of parts of the system. Many of the supports in these regions had previously been replaced due to bottoming a number of years ago.

Constant and variable effort supports can lose support effort (i.e. slump) due to age related degradation mechanisms including creeping springs or corrosion. This typically takes 10 or more years depending upon the operating conditions and environment.

The cause of the slumping in the system was investigated and a number of other possible causes were also identified. These include:

- incorrect turnbuckle adjustment of the bottomed supports;

- the possibility that the previous replacement supports were of the incorrect length; and
- the possibility that the previous replacement supports had incorrect support efforts.

By investigating the historical positions, adjustments and replacement records it was concluded that the slumping was either due to an age related degradation mechanism or incorrect support effort.

The slumping affected a number of pipework supports and replacement would be at some considerable cost and effort to the client.

The solution

EASL were familiar with the station and the systems in question. By calling on our experience of the system and other similar

systems it was possible to propose a solution without the need for expensive and time consuming detailed analysis.

It was recommended that the support effort be increased by 5% via the load screw on all the affected support units. This was successfully completed during the outage at which the slumping was seen.

The result

Following return to service, analysis of the travel positions indicate that the MSS pipework had moved upwards by approximately 10mm. The position of the HTS pipework remained unchanged, however, indicating that there was no evidence of any further slumping.

The adjustments were judged to be successful with considerable cost saving for the client.

