Inspection, Lifetime Monitoring and Maintenance of Pipework Supports

Case study

EASL assists in maintaining the current UK fleet of nuclear power stations by carrying out pipework support surveys and audit walk-downs. During operation there are a number of degradation mechanisms such as fatigue, creep, thermal ageing and corrosion that can affect the operation of pipework supports. In addition repairs and modifications have also been carried out which were not present in the original design. To ensure safe reliable operation a number of approaches are employed including inspection, lifetime monitoring and analysis.

The approach

EASL contributes to a program of lifetime management and system health monitoring for all UK nuclear power stations. However, the methods employed are also appropriate for conventional coal and gas fired power stations, petrochemical plants and other industrial sites where there are degradation mechanisms present and there are significant industrial safety and economic implications of pipework failure.

Part of this work involves plant surveys and audit walk-downs to inspect the state of the plant and record positional movements of the pipework. These surveys and audits are conducted during:

- Normal, hot operating conditions prior to a shutdown;
- Cold shutdown conditions; and
- Normal, hot operating conditions after return to service.

Having carried out the plant surveys, EASL reviews the observations in combination with design/theoretical predictions of pipe movements. The readings are then assessed to ensure that stress levels in the supports and pipework remain within acceptable levels. These levels are generally based on pipework code limits, although in some cases a fitness for purpose case is constructed to show that the system remains safe.

Over time both variable and constant effort supports can lose some load carrying capacity. This typically takes place over a period of 10 or more years, although it will depend on the operating environment, i.e. ambient temperature and humidity.

The survey readings are compared to historical readings to determine any trends that may be present. These trends are used to assess whether the system will remain within acceptable limits over the remaining plant life. This gives early warning of any long term problems that may arise and allows planning of any long term plant maintenance that may be required.

Based on these findings remedial work may be recommended to correct any defects or deficiencies. Alternatively analysis work may be carried out in order to delay or avoid remedial work. Such work may investigate the long term effects of increased system moments against code requirements or to generate a fitness for purpose case for continued operation.

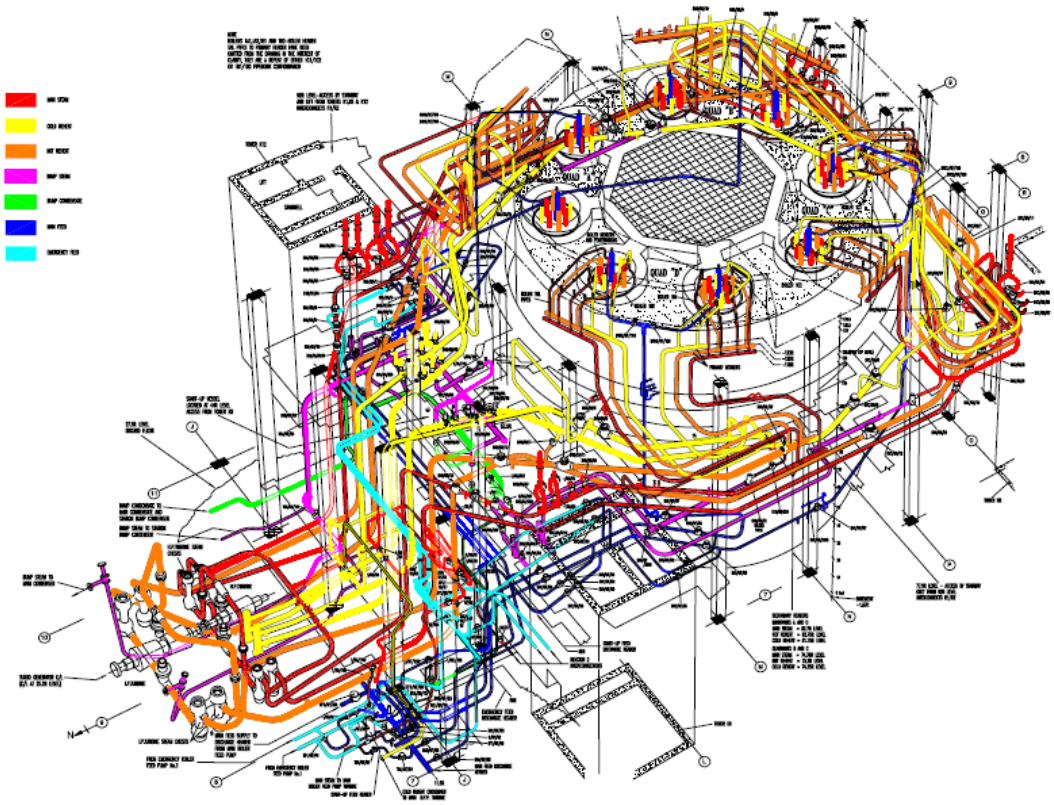
The outcome

Using plant surveys and audit walk-downs the risk of a structural failure of pipework is significantly reduced.

By assessing trends, warnings of long term plant problems are given. This enables long term planning of plant modifications or analysis to be carried out to alleviate the problem.

Overall the use of plant surveys and audit walk-downs helps to maintain safe reliable operation.

Why not see if EASL can help you. Give us a call.



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