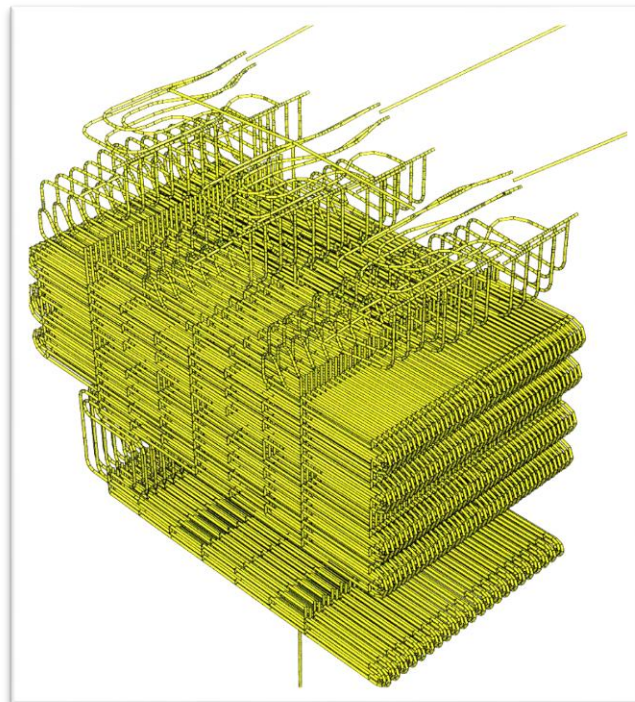


## Nuclear Superheater - Boiler Penetrations

DC White were tasked to assess the seismic integrity of the Hunterston B & Hinkley Point B boilers, in particular the superheater steam pipes and their penetrations into the reactor pressure boundary.

These were seen to be potentially vulnerable to earthquake motions with the possibility that the boilers could topple and release steam into the reactor.



Complex Nuclear Superheater Steam Pipes

The seismic response is dominated by non-linear effects such as impact and local yielding of steelwork. Thus earlier studies, which we performed almost two decades ago, were limited by the available computing power, and were constrained to make conservatively cautious assumptions. When the problem was recently revisited, these conservative assumptions could be reappraised and more computing power employed.

DC White relish these theoretical problems and we were asked to perform an updated appraisal, modelling the earthquake responses for each of the 88 steam pipes within a boiler, yielding in secondary structures and the resulting plastic ratchetting.

There was a concern that this cyclic plasticity could allow the boilers to topple but our work gave convincing proof that this was physically impossible, forming an essential part of the safety case which allowed the running of the reactors for another ten years.

## Get In Touch

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