

Title Interference effects for inline chimneys

Client CICIND

Background Following on from the Rugeley Chimney and TMD monitoring exercise, FSDL proposed to carry out a study on interference effect for inline slender chimneys (figure 1). As a result, CICIND commissioned FSDL to provide design guidance for such effects using numerical techniques for fluid-structure interaction based on computational fluid dynamics and validated using the Rugeley Chimney data.

Response FSDL commissioned a research study managed by Dr Antolin Lorenzana Ibán using advanced CFD software (Figures 2, 3 & 4). Re-evaluation of the Rugeley Chimney performance data has validated the simulations, allowing for extension to a range of different conditions of wind angle and structure configurations.

Outcomes Design guidance is being produced in the form of a spreadsheet. In addition, journal and conference publications are being prepared.



Figure 1: Tandem chimneys at Rugeley Power Station

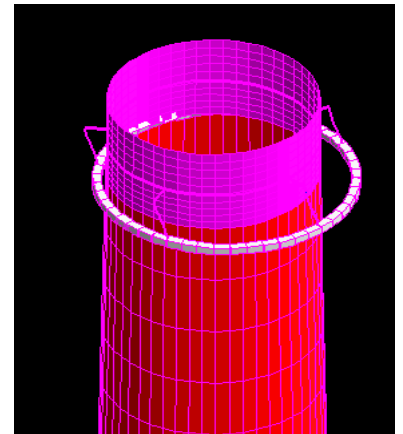


Figure 2: Finite element simulation of chimney and tuned mass damper

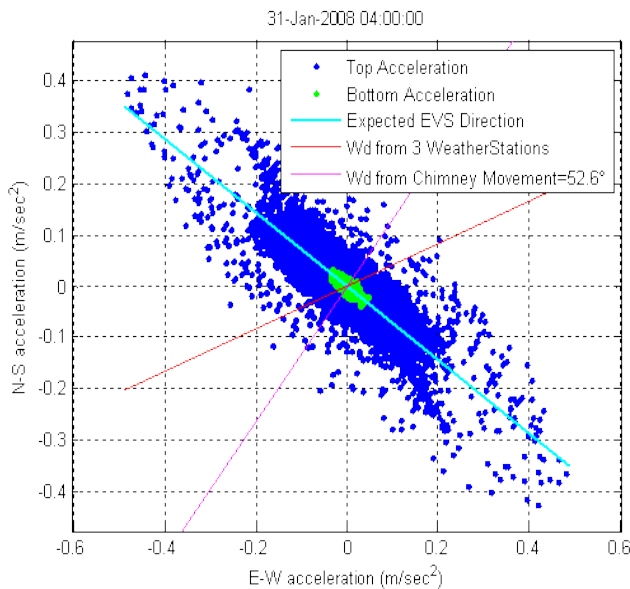


Figure 3: Enhanced response of downwind chimney due to interference

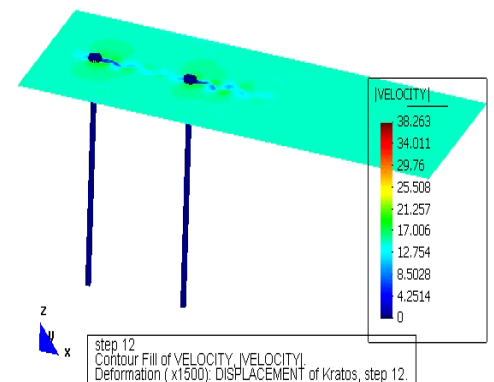


Figure 4: Kratos simulation of interference effect