

Minor Damage Resulting in Vapour Bypassing & Flooding

Pre Job Info: Under normal operating conditions, this tower was experiencing a high pressure differential across the column with liquid being carried overhead.

TowerScan Results: The rates were reduced in order to obtain a scan under stable operating conditions. The first scan showed trays in the middle of the tower (11-17) to be flooded, with evidence of entrainment on the trays higher up the tower. The unusual aspect of the scan profile was the extremely high density seen for the liquid on tray 11. Given that tray 11 was holding liquid, and therefore mechanically sound, TowerScan personnel were confident in predicting that the vapour was bypassing the tray via the downcomer, as there was no aeration of the liquid.

The mechanism causing the vapour bypassing wasn't 100% certain from the profile. Trays 10 and 9 immediately below 11 showed reduced liquid loadings on the tray. Typically this is due to damage, however the possibility of the trays from 11 upwards loading up with liquid and then dumping, temporarily starving the trays below of liquid remained as an alternative explanation.

Subsequent inspection of the tower revealed that the tray deck panel immediately underneath the downcomer from tray 11 was damaged. As such it allowed the vapour to bypass tray 11, and most of the liquid to bypass trays 10 and 9 even though the remainder of that decking was mechanically sound.

Minor Damage Resulting in Vapour Bypass up the Downcomer

