

Distillation Column - Tray Damage

Tru-Scan™ technology provided a quick, cost effective means of diagnosing the cause of off-specification production. Subsequently, replacement trays were ordered in advance and installed during a planned outage allowing the customer to get back online in 5 days after the Tru-Scan™ identified damaged trays.

The interpretation of a Tru-Scan™ can be used to diagnose many operating malfunctions. This includes mechanical, process, or rate related problems - such as tray damage, foaming, weeping, and flooding to name a few.

Tru-Scan™ and Tru-Grid™ Scan applications can assist in defining and developing a turnaround project scope at an early stage to ensure that a turnaround meets timing goals. Scan results will fully prepare turnaround planners with the knowledge they need for critical path decisions that must be made prior to a shutdown.

Often scans are used as a predictive maintenance technique, allowing plant personnel to monitor tray or packing hydraulics. A well executed monitoring program can track the effects of fouling or other incapacitating conditions to extend run times and identify maintenance requirements in advance of scheduled turnarounds.

Project Field Test

In this case study, plant personnel were concerned with the poor separation efficiency of a high purity column. They wanted to verify the condition of the tower internals before pursuing other troubleshooting options. Tracerco was contacted to perform a Tru-Scan™ across the active area to determine if all the trays were in place and holding adequate liquid.

Results of the scan (Figure 1) revealed low liquid levels were detected on Trays 1 - 10. The majority of the trays in this column were not holding a detectable froth level at all, suggesting widespread damage. The chimney tray appeared to be in place but holding no more than 5 cm (2 in) of liquid.

"You guys nailed it! All The trays you identified were down. We were able to buy new trays prior to the shutdown and schedule contractors to install the trays. This allowed us to plan ahead and have the column down and back up in 5 days. As of yesterday morning the columns are producing on spec material at full rate again."

Thank you and your team for your expertise!

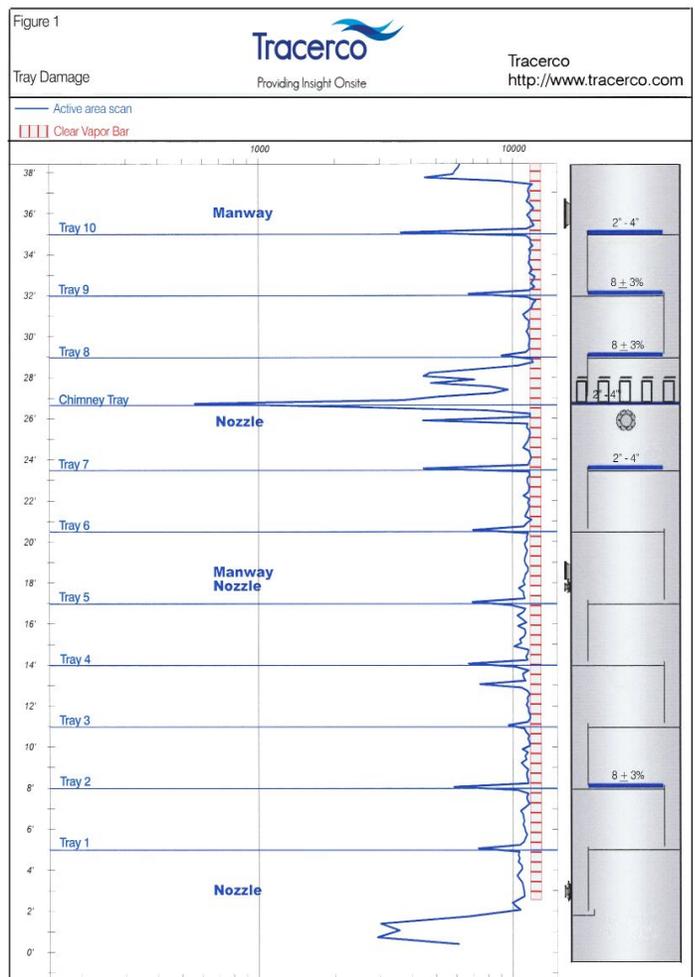


Figure 1 - Scan results detected low liquid levels on Trays 1-6, 9 and 8 which indicated tray damage.

Customer Conclusion

With the results of the column scan, plant personnel decided to schedule a shutdown of the tower to repair/replace the internal trays. Replacement trays were ordered prior to shutting down the column. This allowed operations and maintenance staff to properly plan for the repair work needed. Upon entering the column, staff found that all the trays that were indicated as damaged in the scan results were found damaged as shown in Figure 2.

The Tru-Scan™ results provided critical information that gave plant personnel the ability to buy new trays prior to shutting down and schedule contractors to install the trays. This allowed the plant to have their outage and be back online in only 5 days.

Additionally a second column was scanned and some tray damage was also identified. This column was also repaired during the same outage saving the plant extensive downtime and maintenance costs.

The customer happily reported to Tracerco that both columns were back online and producing on-specification material at full rates again.

Tracerco recommends that once a column is brought back online following a turnaround or repair outage that a baseline scan be performed. Performing a baseline scan with the column clean and operating at full rates will confirm normal operations and allow early detection of degrading conditions such as fouling, damage or other abnormalities.



Figure 2 - An internal photo confirming scan results and the trays had fallen down within the tower.

For further details email: process.diagnostics@tracerco.com or visit: www.tracerco.com/processdiagnostics

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Enabling you to make the right decision

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