

Roxby Services

A Familiar Name A Whole New Company

Innovative Engineering Solutions



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Gamma Scans

SERVICE

Gamma Scanning is used to determine:

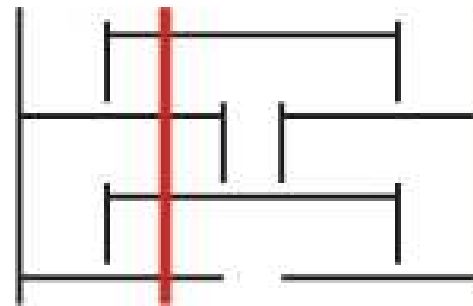
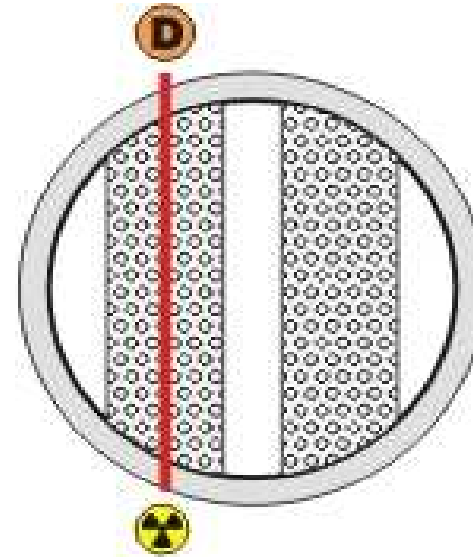
- Damaged or missing trays and internals
- Height of aerated liquid loading on trays
- Height of liquid in down comers
- Location of entrainment and liquid weeping
- Location and characteristics of foaming
- Location and extent of flooding
- Fouling of packing or catalysts
- Flow maldistributions in packing
- Base liquid levels



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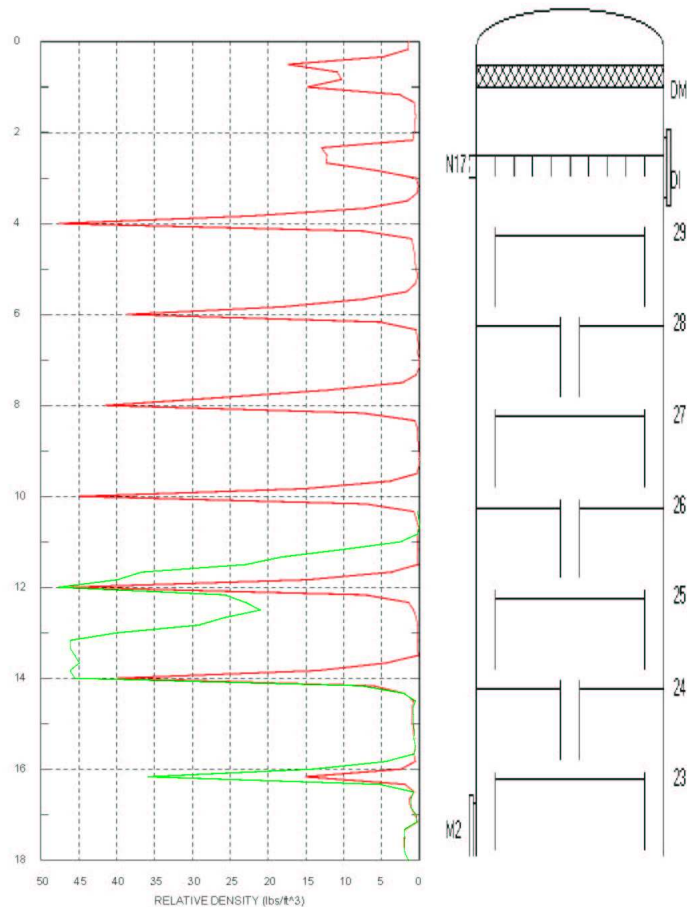
TECHNOLOGY

A small gamma ray source and an electronic detector are positioned on opposite sides of a vessel. As the source and detector move along the exterior of the vessel a density profile of the interior contents is generated. Gamma rays emitted from the source travel through the vessel, are moderated by the contents, and are then counted by the detector.



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Gamma Scans, also known as **Column Scans** or **Tower Scans**, are a *reliable* and *safe* method of characterizing operating conditions in a trayed tower.



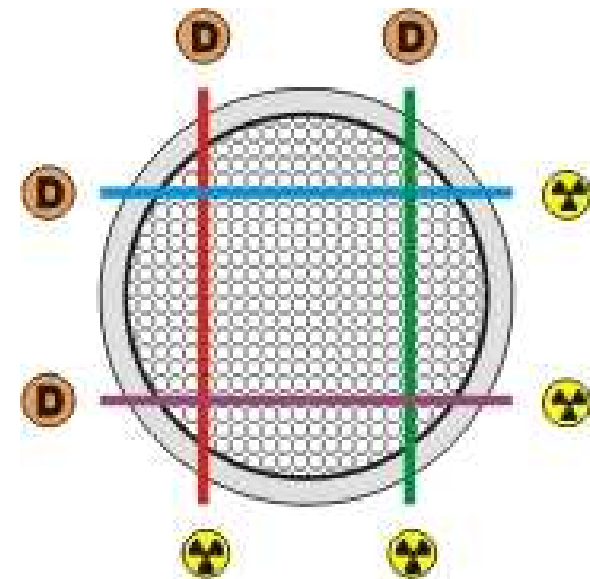
In this sample scan, the red line scan was taken when the column was operating well. The demister and distributor were in position. The trays were present and holding liquid except tray 23 was missing. There was good disengagement to vapour above each tray. A shutdown was performed and tray 23 repaired. The green line shows a scan taken after the column was started back up and problems were experienced. A high liquid level (flooded tray) was apparent on tray 24 with tray 25 also having a greater liquid load due to the flooded tray below.

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Baseline Gamma Scans are performed to obtain the current "normal" operating profile of a vessel. This profile is then used as a reference point for future scans. If problems are suspected, bottlenecks occur or an expansion is planned; a new gamma scan is compared to the baseline to determine differences in the operating conditions.

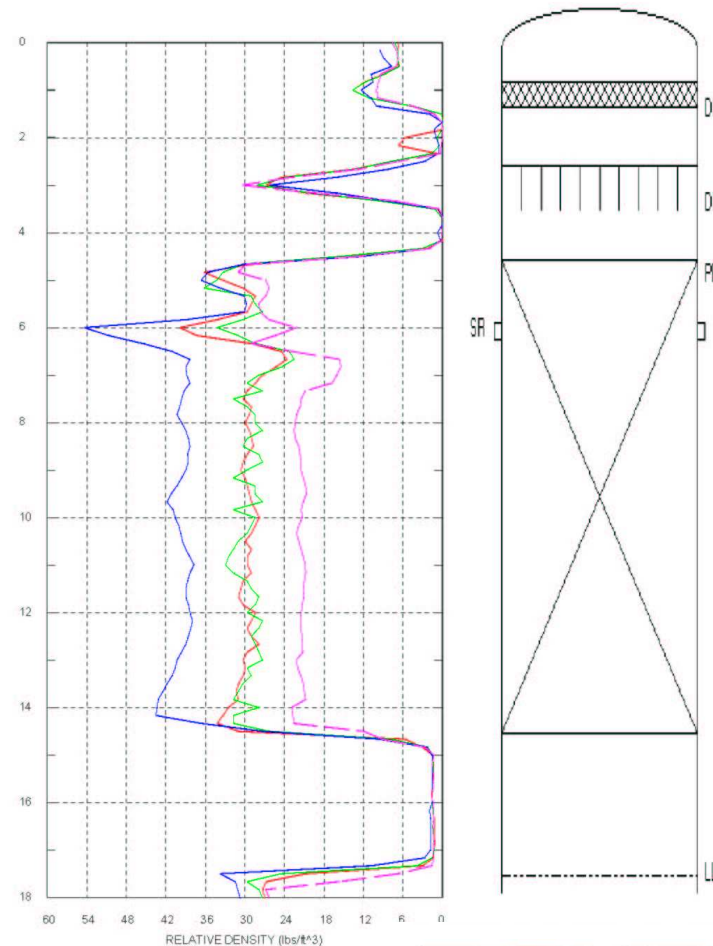


A **Grid Scan** is a series of four scans across the bed. The scans are done with symmetrical geometry as illustrated in the diagram. A Grid Scan is required to evaluate the levelness of vessel internals and determine the amount and location of liquid maldistributions in the packing.



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In this sample Grid Scan, the plots of the four scans were overlaid on the same grid for direct comparison. The red and green scan lines overlay indicating equal flow through those two sides of the bed. The higher density on the blue line indicates preferential liquid flow on this side of the packing while the purple line had a lower density due to less fluid traffic.



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BENEFITS

- Quick reliable service
- Cost-effectiveness
- Operations carried out on-line ensuring no disturbance to production
- Non-intrusive (external to vessel)
- No special setup or preparation of vessel needed before scanning.
- Regular scanning program can be used to monitor a column's performance over time to allow the operator to take corrective action only when needed, reducing down-time and the need for entry during shutdowns.



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