Question 22: What is your method to clean a "Texas Tower" type of combined feed/effluent exchanger? Comment on the differences between cleaning in-place, extraction and reinsertion, and online cleaning.

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This topic has been discussed in 2008 NPRA Q&A session, below is some of the key points.

VCFE Cleaning

Pulling the VCFE tube bundle can be very difficult. Removing and re-installing the bellows is also a difficult task. Care should be taken not to damage the exchanger when pulling or installing the tube bundle. In addition, setting the bundle in the horizontal will, in most instances, cause damage such as tube to tubesheet leaks. UOP does not recommend removing the bundle unless absolutely necessary. It is recommended to wash the exchanger with water in order to remove ammonium chloride salts. Washing with reformate is recommended if the fouling is due to gums or PNA. Removing the bundle should only be done as a last resort.

Cleaning of the tube side is typically successful using high-pressure (up to 10,000 psi) water blasting. This cleaning (hydroblasting) can be done without removing the bundle, as both ends can be made accessible. If the tubeside of the VCFE is plugged, remove the top flange and expose the tubes. The high-pressure water jet lance can be inserted in order to clean the tubes. The shell side is more difficult to clean. Removal of the bundle and hydroblasting has, in most cases, been able to clean away shell-side deposits. But in at least one case, was not effective at cleaning the outside diameter of tubes in the center of the bundle. In-situ attempts at cleaning by washing with reformate or permanganate solutions have produced varying results. Use of hot solvent will help the solubility.

On-line washing procedure for the hot side of CFE by adjusting the last reactor outlet temperature hasbeen done by refineries. The effectiveness of this procedure yields mixed results for improvements.

Tags

Chlorides

Fouling

Heat Exchangers

Naphtha Hydrotreating

Process

Reactor Vessel

Reforming

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