

Accepted Manuscript

Title: Performance Evaluation of Process Tomography System for Cold Flow Catalytic Column

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PII: S0263-8762(17)30370-2
DOI: <http://dx.doi.org/doi:10.1016/j.cherd.2017.07.003>
Reference: CHERD 2744

To appear in:

Received date: 13-4-2017
Revised date: 23-6-2017
Accepted date: 2-7-2017

Please cite this article as: Acharya, Rajesh, Y., Lakshminarayana, Kumar, Umesh, Patankar, V.H., Kar, Soumitra, Dash, Ashutosh, Performance Evaluation of Process Tomography System for Cold Flow Catalytic Column. Chemical Engineering Research and Design <http://dx.doi.org/10.1016/j.cherd.2017.07.003>

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Performance Evaluation of Process Tomography System for Cold Flow Catalytic Column

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HIGHLIGHTS

- Design and Development of industrial Process Tomography system.
- Analysis of Steady state three phase flow distribution across a plane.
- Process tomography for hydrodynamic studies in catalytic columns.
- Radiation imaging for process industries.

Abstract

In a typical catalytic trickle bed type of process reactor, capturing representations of steady-state flow features as well as situations like channelling or bypassing is a challenging task. Transmission-type industrial Process Tomography (PT) based on gamma radiation can be employed in many chemical and process industries as a tool for localizing the problem area for quick and economical troubleshooting. Industrial PT technology often makes use of either penetrating radiation like radioisotope based gamma rays, x-rays, microwaves or ultrasonic waves. We have developed a new gamma-ray transmission tomography system in collaboration with the Indian Oil Corporation Ltd (IOCL R&D Unit, Faridabad, India). The system makes use of thirty two scintillator based gamma-ray detectors in addition to a host of other sub-systems. This paper evaluates the performance of the system considering systematic and automated data acquisition, capabilities of the reconstruction software as well

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