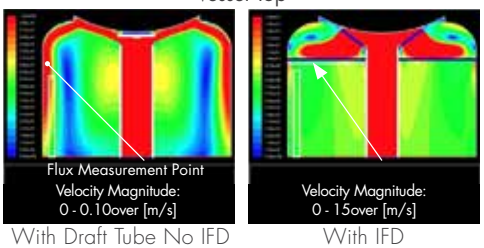
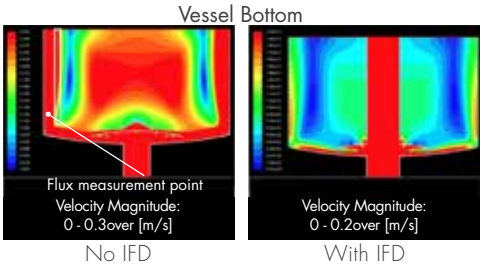
INTEGRATED FLOW DISTRIBUTORS (IFDS)

CFD Modeling-Velocity Profiles
Vessel Top



With Draft Tube No IFD | With IFD

Vessel Bottom



No IFD | With IFD

Integrated Flow Distributor (IFD)

IFDs – WHAT ARE THEY?

IFDs are devices that are installed inside bottom tubesheet F/Ds to improve flow distribution.

Major IFD Components

- New lower baffle plate
- Flow distribution tube
- Upper series of perforated plates

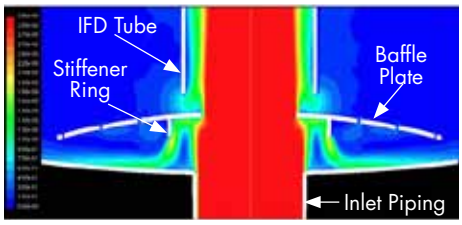
NO WELDING REQUIRED IN THE VESSEL

IFD Design

- Specific to each bottom tubesheet vessel type, dimensions, and operating conditions
- Computational fluid dynamics (CFD) modeling is used for the design

IFD Configuration

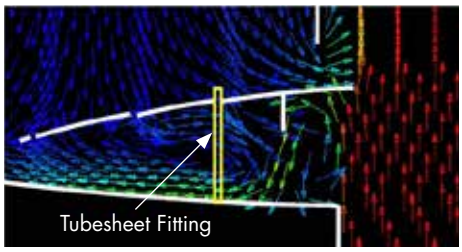
- Majority of flow goes up through IFD tube
- Radial velocity on tubesheet fittings is reduced by ~ 70%
- Applied hydraulic forces on tubesheet fittings are greatly reduced



IFD Benefits

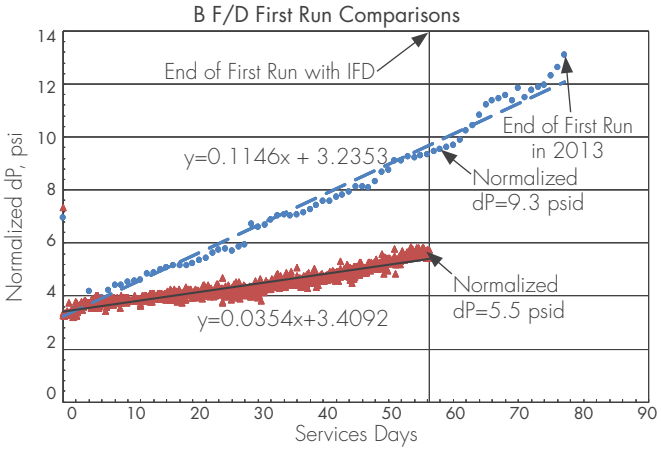
Uniform precoating and improved precoat utilization result in:

- Lower dP rise rate to a dP endpoint
- Longer run lengths, less waste generation
- This benefit is quantifiable



Improved ion exchange performance

- If there are condenser leaks, then IFDs would result in longer run lengths to an effluent chemistry endpoint compared to the case if there are no IFDs.



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