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**Question 54: Does the panel have experience chemically cleaning their reforming unit reactor circuit to minimize the lower explosive limit (LEL) when opening up equipment to the atmosphere in an effort to comply with environmental regulation? If so, is the chemical compatible with the catalyst?**

**KOONTZ** (HollyFrontier)

HollyFrontier does not have experience using a chemical in this case. Our normal procedure involves coke burning prior to opening the reactor, and there has not been a problem with LEL in the system after that.

**CODY NATH** (Refined Technologies)

We actually just presented on a similar topic, and it had a processing section. But yes, we have done this several times for units with chronic LEL problems in fixed-bed reformers.

**JOE ZMICH** (UOP, A Honeywell Company)

Cody, do you take the catalysts out of the reactors, or you leave them in the reactors?

**CODY NATH** (Refined Technologies)

This is done prior to any kind of catalyst activities. Basically, we removed the hydrocarbon that would cause residual LEL. So, whatever you plan to do with the catalyst will not really have any effect on the catalyst. The answer to Part B of that question is that our chemistry is compatible with the catalyst. It simply removes the C6/C8 material that would give you residual LELs. So yes, the catalyst is still in the fixed-bed reactor when we do the application.

**PIZZINI** (Phillips 66)

P66 has avoided using chemical cleaning agents in the reformer reactor circuit to avoid any potential catalyst contamination issues. Nitrogen purges to the flare have been sufficient to prepare this relatively clean service equipment for maintenance.

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## **CARL WEAVER** (Baker Hughes)

With a variety of aqueous decontamination products for process equipment decontamination that are considered “green” and will not harm process catalysts. Specifically addressing reformer decontamination, in one example a Baker Hughes aqueous micro-emulsion cleaner was used to successfully decontaminate the entire reformer process with various application methodologies including liquid circulation and vapor washing. Though formulated for different decontamination applications, a key feature all of the green aqueous decontamination products share is that they contain no phosphorus compounds, alkylphenol ethoxylates, free amines, EDTA (ethylenediaminetetraacetic acid), or EPA-listed VOCs (volatile organic compounds).

## **ROBERTSON** (AFPM)

That was the last question for this group. We should have flip-flopped this session with the Hydroprocessing session. I want to thank the panel for putting in all of their work over the four or five months and doing a great job today. We appreciate it. I also want to thank Yvette Brooks for keeping us on track and thank Wendy Hefter for working hard to manage and edit the transcripts. They both do a great job. The reception starts at 5:15 in the Exhibition Hall. It is where we have lunch. Before you leave, please fill out the green evaluation forms and leave them in the box in the very back between the two doors.

Tomorrow, we start at 8:00 again on the Q&As. We have one Keynote speaker who will give us the Washington political updates. You might be interested in hearing his insight. He is AFPM’s Vice President of Government Affairs, and he will be talking about how we think our industry will be affected if Romney or Obama wins. You should attend if you are interested in hearing AFPM’s outlook for what will happen to our industry based upon the important election coming up. Hopefully, we will see you in the morning. Thank you.

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