MICHAEL: David, can you provide some background information on how your team came to find that the CCC was installed improperly?

DAVID: Well, for the STS-77 mission that was May of 1996, we were installing the EMU as we normally do every mission and we installed the CCC's which is a Contamination Control Cartridge as well as the EMU battery in the back of the EMU before we mounted it on the wall. This night when we were doing it we thought it was the same procedure we had always done and that we installed the CCC's and installed it into the ship and it wasn't until the next day during the EMU functional where we checkout the suits and make sure they're working, in as well as the orbiter systems that support them that we found that was installed backwards, the only reason we did find that they were installed backwards is there was another problem with the orbiter power supply that caused a voltage spike which opened up a feed water valve on the EMU which flooded the back of the EMU sublimator. When we went to take it off the wall to replace that EMU for that flight we noticed that the CCC was installed backwards because of the slight hump on the back of the EMU were it should be flush in the back of the EMU. So, because of the other problem is when we found that we had the CCC installed backward, and then we checked the other suit and that CCC was also installed backward at the same time. So that was the first time it happened and, it hasn't happened since but that's how we found it, from a different problem.

MICHAEL: So is there something special about the physical configuration of the CCC that would allow this to happen?

DAVID: Well the original design of the CCC had two extra water ports on them, they were off center so there was only one way you could install this CCC. Those water ports were designed out of the system and now the CCC had only two ports on either end which allowed it to be installed backwards because they were symmetric to each other. So because of the design change it did allow the CCC to be installed backwards.

MICHAEL: Well what suggestions do you have for future vehicles or operations to prevent this from happening in the future?

DAVID: Well from a design standpoint especially if something being assembled out in the field away from the design center the manufacturer, you should try to design the hardware so it can only be installed one way, the correct way. If because of a redesign that or it cannot physically be designed so it's asymmetrical then there should be some visual cues an and some rigor to the installation process that make sure that it does get installed the correct way.

MICHAEL: Okay so any thoughts on the team that was involved in resolving this issue?

DAVID: Well when it happened, we didn't have new people doing the work cause people done it before and again there was only one visual cue at the time where there is a decal on the on the back of the CCC that should be visible when it's installed correctly and that decal was there but it just got missed that night and after this happened we added more visual cues to the installation process as well as the installation drawing so that it would add an extra flag that you couldn't install it backwards and to you know be careful and put it in the right way.

MICHAEL: Great, thank you David for sharing your knowledge with us on this lesson learned.

DAVID: Your welcome