

Preventing Space Shuttle Disasters Means Getting to the Root Cause

By: Robert Latino*

The Space Shuttle Columbia disaster was barely an hour old and already the pundits were speculating about the “cause.” In the days since that tragic event, a litany of speculators has been parading in front of the media talking about falling foam, missing tiles, the left wing leading edge and anything else that can make them look like they know the “cause of the accident.” This clamoring by the media and pundits about the cause of the Columbia disaster will undoubtedly result in only one true answer; they will not know the true root cause of the disaster. Sure, they will come up with one of the causes, but preventing failures from reoccurring means discovering all of the root causes, not just the first cause you can identify.

Perhaps I am wrong, but I thought the whole reason for the mammoth investigation currently being undertaken involving the Columbia tragedy was to find out the causes, and to take steps to prevent it from happening again. Surely no one would admit to wanting to find the “quick fix” if it only means we’ll lose another seven astronauts down the road. If no one would want it, then why is the media putting so much pressure on the investigators to “give us an answer?” That type of media pressure can only result in one result, giving a quick, easy to find cause to make the “hounds go away.”

The problem with this result is that no disaster like the Columbia is ever because of one, or even two easy to identify causes, such as the often-mentioned insulation falling and damaged left wing tiles. The root causes always go much deeper. For example, what decisions were made and for what reasons to have the insulation designed and installed the way it was? I read with interest a news story that noted the insulation was redesigned to be more environmentally friendly. Does that mean decisions were made that could have contributed to the disaster, purely for environmental reasons? I don’t know, but it is those types of questions and subsequent investigations that will lead to the true root causes of this accident.

Finding root causes is not about placing blame or pointing fingers, it is about finding out reasons failures happen so that changes can be made to prevent them from happening again. NASA undoubtedly understands this evidenced by their statement recently at a press conference.

I have been very careful through these past days not to draw conclusions. It's a very tempting thing to do. You want to draw conclusions as quick as you can, based on the information. But you can't do that. We have been in this business long enough to know that you do down that merry path of making a judgment or a rush to judgment and you will be fooled. You need to go through the process. You need to gather the data. You need to correlate all the data, the time frames, the evidence, the photos, the way the system behaved. And you need to do it under the scrutiny of a microscope for you to get the right answer.

And even though it's a temptation for use to try and make a judgment, our experience has shown that you should not. And we will not until we get all the data together and are able to tell what we believe this information represents as far as a root cause is concerned.

Businesses and industry have been applying this methodology for years to prevent reoccurring equipment and process failures in an effort to make organizations more productive and cost effective. Dramatic returns on investment have resulted from root cause analysis for numerous industries, from oil and paper to manufacturing and service, we need to get that same return for our space program and the media needs to demand that NASA and Congress accept nothing less.

That will be hard for the media and Congress, because it means they will have to back off and allow the investigators to do their jobs without the pressure of the media and politicians demanding answers quickly. The role of investigators in this tragedy is no different than that of a police detective and they must collect the evidence and draw conclusions based on this evidence. Hearsay does not carry weight in a court of law and should not carry weight in the media. Let the facts guide the investigation not public opinion.

The bottom line is that it will take a lot of time and investigating without outside pressure for the true root cause(s) of the Shuttle disaster to be determined. If we don't give NASA that opportunity to do it, then we are setting ourselves up for another disaster in the future.

As with the Challenger investigation, the Columbia investigation will not only focus on the physical causes that lead to the disaster, but also the latent root causes or system failures. These are the decision-making systems that led to the physical root causes. We expect to hear, as we did with Challenger, questions such as: 1) If there was a prior history of losing foam insulation and/or tiles, what was done to eliminate the risk of recurrence? 2) Were safety decisions compromised based on the availability of proper funding? 3) If risk analysis were conducted on potential events such as this and were they acted upon?

In conclusion, put the pressure on the investigators to find the facts, not to be pressured to come up with an answer to satisfy media/public demand!

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