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January 2008

## NASA Shows It Has Learned Columbia's Lessons

Five years ago, with the Columbia space disaster still lurking in the unforeseeable future, there were enough portents to instill a sense of doom and gloom among many of my former Houston colleagues in Mission Control and the shuttle program office. Men with whom I'd worked side by side for two decades (before I left in 1997) confided in private conversations that they had their resumés out and were planning on moving into new career fields. There just was something about the smell of things they didn't like.

Five years have passed. Every one of them is still in their posts today (most with significant promotions). The cultural winds changed, bought at a hideous price in human lives and time—but change they did. NASA as a whole, and especially at the top, had learned what my friends already knew: attitudes towards safety had decayed dangerously. And the Columbia disaster was no 'accident' – it was the consequence of that cultural decay.

What key decision-makers had forgotten (NASA once knew this) was that there's no "secret formula" to space flight, no cook-book set of rules to be followed by rote as a guaranty of safety and success. You can't escape consequences. The people now in charge know this in their bones, and unlike many of the leaders of the previous generation, they had always known it, and had never forgotten it—as others had.

Just how NASA's 'safety culture' got so sick in the years leading up to the Columbia disaster on February 1, 2003 remains a topic of much debate, and a theme worthy of much more serious historical analysis. Perhaps it happened during the cultural upheavals at the birth of the US-Russian space partnership in the mid-1990s, when near-disaster after near-disaster terrified space workers, but never actually killed anybody.

Safety officials had warned about these hazards. But it wasn't merely that top management **didn't seem to want** to know about potential problems that frontline engineers and operators were detecting. Worse, they acted as if they **wanted NOT to know** about them. Blissful ignorance – in which management could assume things would go well unless contrary information was brought to their attention – was the preferred attitude.

These top-level attitudes also explained the social and psychological pressures brought to bear on complainers, on 'lone voices' who might have been 'out of step', or 'not team players' when they voiced safety concerns that were not being properly addressed, in their opinions. For a person tasked with the responsibility of 'making decisions', it was far safer to have a unanimous consensus, even if it turned out to be wrong, than to have to choose between conflicting views. In the latter case, if the rejected view turned out in hindsight to have been correct, the manager's reputation and status would suffer for

making the 'wrong' choice. To any careerist, it is far, FAR better to be spared that risk, and to only get 'unanimity' from advisors.

And here is the surest sign of an improved culture today, since the lessons of 'Columbia' – with NASA's nose rubbed into them by the independent Columbia Accident Investigation Board – have guaranteed that such bullied unanimity and blind guesses no longer prevail. "Safety" is no longer the 'default' state, assumed in the absence of contrary evidence – it now must be PROVED to exist. Decision-making meetings are long and raucous. Dissenters don't always obediently, meekly shut up and fade away (they rarely if ever do). Both through personal accounts, and through purloined copies of internal reports that somehow still seem to make their way to my inbox, I get the clear impression that people are no longer producing the 'right answers' convenient to the managers – they are coming up with the 'right questions', often very inconvenient ones.

If I could fit that onto a bumper sticker, I would do so – for everybody in the space business and all other high-tech high-risk enterprises. As Mike Griffin has said, spaceflight is so difficult that we are only just barely capable of conducting it with acceptably low levels of risk. And what makes us capable, these days, are the attitudes toward safety now in evidence in these meetings and in these minds of the men and women involved.