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To boldly go where?

By Stephan R. McCandliss

THE DECISION by NASA Administrator Sean O'Keefe to cancel further repair missions to the Hubble Space Telescope has dismayed astronomers around the planet. The new rules guiding the space shuttle's return to flight after the Columbia disaster were cited as only one of many reasons for the decision.

The rules specified by the Columbia Accident Investigation Board (CAIB) require three conditions for any future shuttle flight: the ability to inspect the underside of the shuttle for compromised tiles in the heat shield, the ability to fix the tiles in orbit, and the ability to grant shuttle astronauts a safe haven in the event the heat shield is irreparable.

These conditions can be met at the space station, where there is a considerable infrastructure. Trying to meet them in the sparse orbital environment of Hubble is another matter. A new shuttle arm would have to be designed to allow inspection of the underside of the shuttle, and a fully fueled shuttle would have to be ready to provide a safe haven in the event of an emergency.

No one can reasonably argue with these safety and cost concerns, just as no one can reasonably argue that Hubble will never have to be visited again.

Good space neighbor policy requires that the telescope be de-orbited with a certain level of control rather than to let its pieces fall through the Earth's atmosphere. Most nations take a dim view of having space hardware rain down on them at random.

NASA expects that by 2012, when the orbit of the telescope has decayed due to drag created by the Earth's upper atmosphere, its proficiency in robotics by then will make it possible to mount an unmanned mission to crash Hubble into the ocean.

For astronomers, especially space astronomers accustomed to the unforgiving environment of space,

these arguments concerning safety and cost are palpable but offer cold comfort. Enormous costly effort has already been expended in preparing for Hubble Servicing Mission 4 (SM4), which invariably involves much personal sacrifice.

But Mr. O'Keefe canceled SM4, which was to have taken place in 2006. A new imaging system, spectrograph, batteries and gyroscopes were to have been installed on Hubble to extend the telescope's life to the end of the decade.

The loss of science will be sorely felt and will not be recoverable by the new James Webb Space Telescope, which is to be launched no sooner than sometime in the next decade.

The fate of Hubble has always been tied to that of the space shuttle. The shuttle was sold to Congress as the means for astronauts to learn to work in space, and servicing the telescope was the job that was created for it by a willing astronomical community.

The ability to service Hubble has been integral to the telescope's success and longevity. It should be no surprise that the decision by President Bush to give NASA a new mission with no role for the space shuttle beyond satisfying its international commitment to the space station should spell the early demise of the telescope. What is not clear is how much of the current NASA strategic plan, formerly aimed at answering the question, "Are we alone in the universe?" will survive in the new era of "to boldly go."

What is particularly hard to swallow for people whose job it is to develop realistic solutions to seeming intractable problems (such as dealing with Hubble's faulty primary mirror) is the apparent lack of can-do attitude on the part of Mr. O'Keefe toward saving the science goals they envisioned for the SM4 instruments. These are people who have been trained all their careers to work the problem. Don't expect them to lie down with a whimper.

They have already respectfully pointed out how the sudden risk aversion concerning the safety of shuttle flights does not square with the enormous risks to be encountered with developing a permanent presence on the moon and Mars. Some have gone so far as to suggest that saving the SM4 science is a grand challenge and perhaps a worthy test for our soon-to-be-developed robotic proficiency.

Perhaps a robotic mission could be devised to move Hubble into a space station orbit where it could be worked on safely under the shuttle's new return-to-flight rules. Perhaps we could give the Russians a contract for SM4. Perhaps the very powerful instruments developed for SM4 could be integrated into another mission. Perhaps we should

not allow the shuttle to become damaged by falling foam in the first place.

Whatever the fate of the SM4 instruments and their developers, Mr. Bush's proposed new direction for NASA will require a fortitude and courage that will make saving telescopes (or Apollo 13 astronauts) just another day's work. I know a few people who are itching for the chance to make SM4 happen in some way, if only they were asked. These are the same people you want at your back when the really dangerous stuff starts to fly.

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