**News Focus**

Strong political backing and the promise of more money may help NASA Administrator Sean O’Keefe fulfill a bold new vision—if the agency can survive the current investigation.

**After Columbia, a New NASA?**

From disaster comes good fortune, according to a Chinese proverb. If that holds true, the tragic loss of Columbia and its crew may breathe life into NASA Administrator Sean O’Keefe’s plan to build a complement to the space shuttle, revolutionize space science missions, and create the steppingstones for human missions beyond Earth orbit.

That potential good fortune is the result of an unusual constellation of events that strengthen O’Keefe’s hand as he begins discussions this week on Capitol Hill about the civil space program. “It’s a singular opportunity,” says Charles Kennel, chair of NASA’s Advisory Council and head of Scripps Institution of Oceanography in San Diego, California. “The course of the program over the next 20 years will be set by the debate we’re about to begin.”

Kennel and others predict that the shuttle and space station programs will emerge in a stronger position, and that the political spotlight will help NASA resolve nagging questions about future launch systems and human missions beyond Earth orbit.

The short-term challenges for NASA, however, remain daunting. Hundreds of investigators continue to comb through Texas fields, Louisiana swamps, NASA computers, and Air Force photographs in search of clues to the shuttle’s sudden disintegration. The longer the mystery remains unsolved, the longer the shuttle fleet is likely to remain grounded. Meanwhile, agency managers are struggling to figure out the impact of the disaster on everything from the 2004 planned servicing of the Hubble Space Telescope to the cost of storing space station equipment shelved due to the grounding of the shuttle fleet. Outside the shuttle, there is no immediate crisis: The space station is well supplied and accessible with Russian vehicles, Hubble doesn’t need maintenance for the foreseeable future, and money slated for flying the shuttle can help cover the unexpected costs.

Nevertheless, shaken lawmakers promise sweeping reviews of the agency.

O’Keefe, they note, has powerful advocates on his side. Three of his former bosses are now in influential positions: Vice President Dick Cheney, White House Office of Management and Budget Director Mitch Daniels, and Senator Ted Stevens (R–AK), who chairs the powerful Appropriations Committee. Stevens told O’Keefe 3 February that he will do everything he can to help NASA overcome any fiscal difficulties. Cheney, speaking of the astronauts at a 6 February memorial service at Washington’s National Cathedral, said “their greatest memorial will be a vibrant space program with new missions carried out by a new generation of brave explorers.”

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**Science soars**

Past administrators confronted with the loss of astronauts went through the political ringer and struggled to keep their human space-flight programs—Apollo and then the space shuttle—afloat. But O’Keefe not only has strong political connections, he’s also got a specific plan that bears the White House seal of approval. The plan, laid out in the 2004 budget request released 3 February, would end a decade of stagnant NASA budgets in favor of modest but steady increases. The bulk of the increases would go to a small space plane that could complement the shuttle and to a raft of space science efforts that
Disaster Sets Off Science Scramble

The Columbia tragedy has grounded the fleet of U.S. space shuttles and halted construction of the international space station. But that leaves the station’s crew temporarily available to perform other tasks, including more experiments, if space officials can figure out a way to get them what they need. “We have additional samples and supplies” aboard the station to extend the current research program, says John Uri, a member of the newly organized station utilization recovery team at Johnson Space Center in Houston, Texas. “We’re looking at how the crew can do more science.”

The current crew of three arrived on the station in November. It was scheduled to leave next month after conducting almost two dozen experiments, ranging from the effects of long-duration space flight on skeletal tissue to the impact of the station’s own vibrations on experimental measurements. Unfortunately, a shipment of new parts that arrived last week on a Russian Progress cargo ship didn’t help the astronauts fix an apparent electrical short that has knocked out a glove box critical for a host of materials experiments. Uri says the crew will continue to try to repair the equipment.

By juggling the resupply schedule and depending on Russian vehicles, at least in the near term, NASA planners hope to keep the astronauts busy doing science. Russian officials say they will do what they can to accommodate the Americans in their hour of need. The next Progress vehicle, for example, may be able to ferry additional research material. The Russian capsule, which normally brings food, water, and other supplies, could be readied earlier than its scheduled June launch. But bringing down what goes up is the real problem. “That’s the choke point,” explains Uri. Progress vehicles don’t return to Earth—they are allowed to burn up in reentry—and the Soyuz capsules, which hold a crew of three, have limited storage space.

What’s worse, neither one can carry the refrigerator-sized racks that hold the bulk of U.S. experiments. The European Space Agency (ESA) has offered to speed up work on a robotic spacecraft, the Advanced Transfer Vehicle, that could carry the racks into orbit. But it likely won’t be ready until the summer of 2004, and its ride into space, Ariane 5, was itself grounded after a recent failure.

Seven racks are now on the station, and a shuttle was slated to haul three more into orbit next month when it brought up a new crew. Meanwhile, in April, a Soyuz is scheduled to replace one now docked to the station. That vehicle serves as a lifeboat in case of emergency, and it needs to be replaced every 6 months in order to assure reliability.

The Russians had planned to fill the Soyuz on its weeklong stay with an ESA astronaut, a cosmonaut, and possibly a paying tourist. Both Russian and ESA officials say they are willing to alter that plan if NASA instead wants to bring back the two Americans and one Russian now in orbit. “Manned flights will have to be adjusted,” Energia Corp. president Yuri Semonov told reporters last week. Those issues are currently taking a back seat to the investigation, says Michael Kostelnik, NASA shuttle and station chief, but he expects them to come to the fore in the next few weeks.

—A.L.
Funding for other areas of science, such as earth, biological, and physical sciences, would grow by smaller percentages. But a human research initiative designed to study crew safety during deep-space missions would begin at $39 million this year and grow to $347 million by 2008. Agency planners envision astronauts assembling large telescopes or complex planetary probes at a depot outside Earth orbit, eventually following those probes when it makes good research sense. “We don’t want to throw humans at every problem,” says Harley Thronson, chief technologist in NASA’s space science office. “But we want to find ecological niches” that would benefit science missions.

What to do with humans once the space station is complete is sure to come up in the congressional debate, predicts Kennel. And NASA had better have some options in place. “The one intolerable thing is if there is no definition of a next step,” he says. “That would be politically bad.”

No free launch
No launchers, no exploration. A decade of pouring money into advanced launch technology has produced little, and a frustrated O’Keefe decided last year that NASA should continue upgrading and modernizing the shuttle to keep it flying as far into the future as 2020. The loss of Columbia will force NASA and Congress to reconsider that choice, which likely will prove the most controversial decision in the new plan.

But O’Keefe also proposed in November that NASA consider building an Orbital Space Plane. A more modest winged vehicle than the shuttle, it would sit on top of an existing expendable rocket and travel to and from the station, with or without crew. It could also serve as a lifeboat for space station personnel.

But the idea has won little support from many aerospace contractors, who fear it could replace the shuttles—and their lucrative contracts—or from legislators, who question its feasibility and its price tag. The shuttle grounding could prompt O’Keefe to put the program on a faster track in order to ensure an alternative to the shuttle. But gaining political support for this may be tough. “You won’t get a multibillion-dollar appropriation for this,” a House aide says. “It’s not going to happen.”

NASA declines to estimate the plane’s cost, but one industry official says that development costs could exceed $35 billion—

or more if NASA wants it to fly before the current target of 2012. NASA seeks to spend $550 million on the program in 2004 and an additional $515 million for next-generation launch technology.

The European Space Agency approached NASA about jointly building the space plane but was rebuffed, according to NASA officials. O’Keefe, a former Navy secretary and Defense Department comptroller, prefers to work with NASA’s richer cousin, the military. “It’s the difference between holding a bake sale and winning the lotto,” explains one aerospace company manager. The Defense Department hopes the plane would be able to move around its space assets—such as spy satellites—already in orbit.

But even a 2012 launch will leave NASA without its own space station rescue vehicle for six long years after Russia’s obligation to make Soyuz available expires in 2006. If the station partners hope to expand the station to a crew of six, they will need to have either two Soyuz vessels on hand or a new vehicle altogether. Political constraints make the former difficult, and the huge cost of building a new rescue vehicle by 2006 seem prohibitive.

Despite these tough issues, O’Keefe is in a good position to make his case. “There will be a reexamination of the program, and it will come out stronger, just as it did after Apollo 1 and Challenger,” predicts John Bahcall, an astronomer at Princeton University in New Jersey.

So far, the agency is earning high marks for its handling of the investigation. “They’ll shoot straight with us, because they want to know” the cause of failure, former President Bill Clinton said 6 February. But it won’t all be smooth sailing. That same day, responding to congressional criticism of the accident-investigation team’s makeup, O’Keefe added more non-NASA and military officials to “eliminate any ambiguity about the independence of this group.”

In the months ahead, a protracted war with Iraq could undermine public and political interest in the space program. O’Keefe’s push to tie NASA more closely to the military could also backfire, and his desire to expand use of nuclear systems also might provoke a backlash. Given those potential pitfalls, more midcourse corrections seem likely as NASA’s administrator navigates his ambitious plans through the treacherous waters created by the tragedy over Texas.

Andrew Lawler

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