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States Embark on a Space Race

With the space shuttle's final flight, states are scrambling to land the next phase of the aerospace industry.

BY: RUSSELL NICHOLS | AUGUST 31, 2011

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T-minus 31 seconds.

Half a minute before the final launch of NASA's storied shuttle program, the countdown clock has stopped. For several tense moments, millions of people watch with bated breath as the ground crew made an unexpected last-minute check. The suspense is palpable. Watching from the bleachers at the Banana Creek viewing site three miles away, Florida state Rep. Ritch Workman is speechless.

That's not a condition Workman usually finds himself in. An outgoing, burly guy with a buzz cut, Workman's not generally known as someone who bites his tongue. And he's had much to say in the past few years as his state prepared to say goodbye to

the program that has fueled local economies for three decades. As the co-chair of the Florida Space Caucus, Workman has been one of the key drivers of legislation to lure aerospace businesses with tax and financial incentives, in a bid to keep rocket scientists from leaving the Space Coast. He's no fan of limbo.

"When you think of Florida, typically two things come to mind: Mickey Mouse and spaceflight," he said weeks earlier. "We have pride and ownership in being America's spaceport, so it's sad that we're not going to have manned rockets anytime soon."

That morning of July 8, 2011, about a million people were in Cape Canaveral to witness the historic 33rd flight of Atlantis, the final bow for the shuttle program that began here 30 years ago. Observers came from all over the country to watch the launch, which some say marks the end of America's dominance as the world's pioneer of the space frontier. The people came that morning despite a 70 percent chance that the launch would be postponed due to threatening skies.

But a much broader sense of uncertainty has been looming over the space industry. Since 1981, the shuttle program has played a vital role in various economies across the country. That's over now. For the next few years, U.S. astronauts will have to hitch a ride on the Russian Soyuz spacecraft to get to space. Added to that are the thousands of shuttle program workers who must now try to find new jobs in a gloomy economy.

"The shutdown of the shuttle program was announced seven years ago," says John Logsdon, a space program historian and former director of George Washington University's Space Policy Institute. "It should come as no surprise that there would be this threat of job reduction. The politicians who are just waking up to say, 'Hey, we've got a problem,' have been asleep on this issue."

No state has been hit harder than Florida, where some 8,000 workers from the space shuttle program were laid off, and the ripple effect has impacted thousands more. On a mission to keep the industry from disintegrating, state lawmakers, including Workman, have been trying to bring space programs to the state so displaced employees won't be out of work for long.

But the competition for those jobs will be fierce. Several other states are looking to boost their own aerospace industries. The federal government wants the private sector to assist in routine space duties, and public officials in places like New Mexico, Oklahoma, Texas and Virginia want in on the action. As states scramble for the next phase of the space industry, there's no certainty about where exactly the industry is headed. Most state leaders are stuck waiting to see how the transition will play out.

At the Kennedy Space Center on the morning of the final launch, the heart-stopping hold at T-minus 31 seconds didn't last for long. Within a few minutes, ground crews confirmed that a vent arm at the top of the shuttle was fully retracted. The mission was a go. The clock resumed. The crowd counted down. The main engines blasted, taking Atlantis up and away into gray clouds, leaving behind a host of questions about America's foreseeable future in space.

"I'm more sad than excited," Workman says as he files out with the crowd to the bus depot. "We'll never see that again."

T-minus 30 years.

In 1972, President Richard Nixon pushed NASA to develop a reusable shuttle vehicle for space exploration. Building off President John F. Kennedy's success with putting a man on the moon in 1969, Nixon envisioned the shuttle program -- officially called the Space Transportation System -- launching some 50 missions a year. These winged vehicles were designed to carry cargo and supplies into orbit, perform service missions and help complete assembly of the International Space Station.

The first shuttle launch didn't happen until April 12, 1981, when a 151,000-pound monster orbiter called Columbia shot into space -- exactly 20 years after the first manned spaceflight. But between the end of the Apollo program in 1975 and that first shuttle launch, there was a protracted hiatus in U.S. human spaceflight. As a result, many NASA managers and former astronauts look at the current end of the shuttle program with a sense of déjà vu. "I also witnessed firsthand the economic devastation of the aerospace industry downturn while working at Kennedy Space Center in Florida in the 1970s," wrote Robert Crippen, a former astronaut and pilot in the first space shuttle mission, in the *Houston Chronicle* in 2009. "The six-year gap between the Apollo and shuttle programs cost America more than 400,000 jobs. The Space Coast, Houston and other cities that thrived on aerospace were hit especially hard. Once again, we face the prospect of thousands of layoffs and the residual economic blow nationwide."

With the first launch of Columbia, the shuttle program was under way. It promised to keep America at the forefront of space exploration with the ability to send crews into orbit to develop space infrastructure. But it wasn't perfect. The program, critics say, failed to achieve its cost and utility goals, and suffered from flaws in management, design and safety that had tragic consequences.

In 1986, the space shuttle Challenger broke apart 73 seconds into its flight, killing all seven crew members and disintegrating off the coast of central Florida. An investigation followed, which grounded the NASA fleet for nearly three years. In 2003, tragedy struck again when Columbia was destroyed during re-entry into the Earth's atmosphere, also killing all seven astronauts on board.

After an independent investigation found major design flaws and management failures in the shuttle program, President George W. Bush decided the time had come to bring it to an end.

T-minus seven years.

On Jan. 14, 2004, Bush unveiled a new vision for space exploration in a speech at NASA headquarters in Washington, D.C. This new vision, he said, would put America on track to return to the moon and start plotting "new journeys to the worlds beyond our own."

He laid out his vision in three parts: First, America would complete the International Space Station by 2010. Next, the U.S. would develop a new manned exploration vehicle, which could conduct its first mission in 2014. After that, America would focus on a 2020 trip to the moon, and then beyond. But Bush's sweeping plan -- dubbed Constellation within NASA -- had no place for the shuttle program. He set its cutoff date for 2010.

Last year, however, President Obama scrapped the Constellation program, saying it was too costly. Instead, Obama advocated an overhaul that included radical new space technologies and a heavy reliance on the private sector. But these new technologies need to be built, which means that the next NASA manned-spaceflight program to take astronauts to the moon or beyond won't see the light of day before 2018.

It is this gap in aerospace industries that has some public and private officials concerned about the United States' space preeminence. "We knew there were going to be layoffs, but we didn't know the administration was going to cancel an entire program," says Bob Mitchell, president of the Bay Area Houston Economic Partnership. "Overnight, we went from working on placing 700 individuals to a potential 7,000."

Industry clusters in other states have reached out to workers in Texas, but U.S. Rep. Pete Olson says the state has been doing everything in its power -- from placement centers to design and development job fairs -- to keep workers from migrating across the state line. Mitchell agrees. "If one got away," he says, "that was one too many."

Virginia has been especially aggressive in the fight to attract displaced workers, using its existing research base as a selling point. In January, Gov. Bob McDonnell cited a recent study showing that Virginia's aerospace industry had a \$7.6 billion annual impact on the state's economy, and that workers in the field earned higher wages than the state average. In 2009, the governor's office noted, the industry supported 28,110 direct and indirect aerospace jobs in Virginia.

At NASA's Wallops Island Flight Facility on Virginia's Eastern Shore, the Mid-Atlantic Regional Spaceport (MARS) is set to be the launch site for nine unmanned missions established to help resupply the space station through 2015. Carried out by Dulles Airport-based Orbital Sciences Corp. under a \$1.9 billion NASA contract, these missions represent the core of a plan by the Virginia Commercial Space Flight Authority to make MARS the nation's premier commercial spaceport, according to Billie Reed, executive director of the flight authority and MARS.

To Reed, the end of the shuttle program has opened the doors for companies no longer willing to watch space travel from the sidelines, and Virginia has a chance to take advantage of that opening. "We have advertised that we are seeking folks with certain skills, but for a long time, they had not necessarily been available in our region," he says. "The demise of the shuttle program has enhanced our opportunity. What's better for them happens to be good for us."

Similarly, other states want to capitalize on this private-sector paradigm shift, kicking off something of a space race for a new generation. New Mexico has already spent \$140 million to help fund what's being billed as the world's first "purpose-built" commercial spaceport. Called Spaceport America, the complex sits on 18,000 acres of sunbaked desert in the southwestern part of the state. Its anchor tenant, Virgin Galactic, plans to offer commercial spaceflights for anyone who wants a suborbital joyride -- and can afford the \$200,000 price of a seat.

In Oklahoma, officials boast that their state already has a facility that can handle commercial spacecraft. Outside the town of Burns Flat, a hundred miles west of Oklahoma City, the state has recommissioned a former Strategic Air Command base as the Oklahoma Spaceport. The site includes a 13,000-foot runway -- one of the longest in the country -- and it's the nation's only inland spaceflight corridor that's clear of any military-restricted operations or airspace, according to Bill Khourie, executive director of the Oklahoma Space Industry Development Authority.

"When you come to schedule a flight, the flight will go off at the scheduled time unless the weather or any other acts of God should put a stop to it," he says. "As the vehicles develop and the companies get ready to operate, they're going to have to have somewhere to operate from. We have the infrastructure and we have the airspace."

Other places are going after the space industry from a research and development angle. That's what interests Thomas M. Battle Jr., the mayor of Huntsville, Ala., otherwise known as "Rocket City." Since 1960, Huntsville has been home to the Marshall Space Flight Center, NASA's first field center. Today, the city is a hub for research in space propulsion, engineering and project management. Battle says there are thousands of available jobs and millions of square feet of new industrial additions in his city's thriving defense and aerospace market. He was buoyed by the \$1.8 billion Congress set aside this year for NASA to develop a new heavy-lift rocket -- and by the decision to designate the Marshall Center as the program's oversight office. But what's lacking, he says, is a concrete plan for the future of manned spaceflight. "The [next] step is to go to other planets, the first obviously being Mars," Battle says. "J.F.K. had a great vision. This administration has an opportunity to move forward with its own visionary plan. Give us the vision, we'll complete the mission."

T-minus one hour.

At the Banana Creek viewing site, Florida state Sen. Thad Altman stands with the crowd and stares at the horizon. "I thought we learned from what happened in 1975 to bridge the gap," he says. "But lo and behold, here we are." Altman, who co-chairs the Florida Space Caucus, points to an empty pad in the distance, built for the now-abandoned Constellation program. "It's a shame."

But, he says, all hope is not lost. Private companies like Boeing and the Sierra Nevada Corp. are powering forward in Florida. The newly launched SpaceX (Space Exploration Technologies Corp.), a firm started by PayPal founder Elon Musk that successfully launched its capsule spaceship, Dragon, from Cape Canaveral into orbit last December. No other state, Altman says, can compete with the facilities here on the Space Coast.

For leaders like Altman, the final countdown of the shuttle program marks a turning point, but not an ending. In fact, he says, the demise of the shuttle is really a launching point for a new era in space, one in which states and the private sector will work together to explore a new frontier.

Exploring Options

As soon as news broke that the space shuttle program would end, NASA switched into transition mode. With layoffs imminent, agency officials wanted to help workers prepare for the future. So within a few years, NASA set up a space shuttle transition liaison office.

The plan was twofold: train the workforce and spur economic development. With this new mission taking priority, officials established transition centers, which provide support with job searches, resumé writing, counseling and so forth. But it was also critical to get out into the community, bringing experts from the U.S. Department of Commerce and the U.S. Small Business Administration into regions that were affected the most, like Florida and Texas. Each state has its unique unemployment laws and business relationships, but by sharing resources, states could adopt best practices, says Sue Leibert, who heads the Space Shuttle Transition Liaison Office. For example, Texas found success using LinkedIn to communicate job openings, and other states followed suit.

Through the economic development component, NASA focused on building partnerships, coalitions and regional innovation clusters. The work is not done. In total, NASA estimated laying off about 5,000 contractors this year, Leibert says. But she hopes that by creating these clusters that utilize their diverse skills, displaced workers won't stray too far from the aerospace industry. "We're going to want some of those workers back," Leibert says, "so we'd like to selfishly keep them close by."

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