NASA hopes to test new spaceship in 2014

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There's no firm date yet, but sometime in early 2014 NASA intends to take its first major step toward rebuilding its human spaceflight program.

The milestone is the maiden test flight of its Orion spacecraft, a launch that has come into sharper relief in the three months since NASA and manufacturer Lockheed Martin announced it.

As planned, an unmanned Orion capsule will begin its journey at Cape Canaveral and take two loops around Earth before splashing down in the Pacific Ocean. What's now clear is that the capsule will be sent far beyond the lower Earth orbit of the International Space Station.

At its peak, Orion's orbit is expected to extend nearly 3,700 miles from Earth - the farthest a NASA spacecraft built for humans has gone since the early 1970s.

That distance is "significantly higher than human spaceflight has gone since Apollo," said Larry Price, Orion deputy program manager at Lockheed Martin. "The reason for that is so we can get a high-energy entry so we can stress the heat shield."

The test will determine whether Orion can survive the re-entry into Earth's atmosphere - where temperatures are expected to reach 4,000 degrees - in preparation for a human flight in 2021. NASA hopes that Orion eventually can carry astronauts back to the moon or to nearby asteroids.

Besides the heat shield, the practice flight is designed to test 10 systems whose failure could be disastrous, including the capsule's flight software and parachutes. Like its Apollo-era predecessors, the four-person Orion capsule is designed to land in water.

"The beauty about flying in 2014 is that we can learn early [if there are problems], so if we find something we really got to fix we've got time before we fly people," said Mark Geyer, head of the Orion program at NASA.

The test also gives NASA, and Orion manufacturer Lockheed Martin, a chance to showcase part of the agency's new exploration program, details of which were agreed to last fall after a year of negotiation among the White House, Congress and industry.

In Florida, the test flight, which will cost $375 million, will provide Kennedy Space Center with some badly needed work. The retirement of the shuttle led to the loss of at least 6,000 jobs. Lockheed Martin plans to employ as many as 400 workers for Orion at Cape Canaveral as it approaches the test flight.

NASA's exploration program still is years away from being operational, and NASA leaders see the Orion test as a morale booster.

"It helps keep a sense of urgency. It helps keep the team focused on getting the work done. There's nothing like a flight to focus a team to get the work done on time," Geyer said.

The timetable for NASA's new exploration program envisions a first manned flight of Orion in 2021 aboard a new rocket - still under development - that NASA expects to be the most powerful ever. An unmanned test flight of that rocket, being built by Lockheed Martin rivals Boeing and ATK, is planned for 2017.

Orion, which already has cost $6 billion, is much farther along-as the capsule was salvaged from the defunct Constellation moon program, which Obama and Congress canceled in 2010.

So - at Lockheed Martin's urging - NASA decided to test Orion before the new rocket was ready.

Officially, Lockheed Martin has not yet selected a rocket for the Orion test; an announcement is expected in mid-February. Congressional, agency and industry sources, however, all expect the company to select its own rocket, the Delta IV, for the flight.

That has led to suspicion as to whether Lockheed Martin was either trying to upstage the new Space Launch System rocket or muscle in on the emerging market for commercial rockets, which NASA hopes will launch crew and cargo to the ISS within the next several years.

Two other companies, Boeing and SpaceX, offered their rockets to NASA as the agency was deciding whether to give Lockheed Martin full control over what rocket it would use for the test flight.

NASA rejected these offers, citing Lockheed's experience with both the capsule and its rocket.

"[The] level of knowledge, specifically focused on the integration of the Orion spacecraft with a launch vehicle, gained over the 5-year period of performance under the Orion Contract could not be reasonably obtained by another contractor in time to meet the early 2014 launch date requirement," wrote NASA in its justification.

When asked about the possibility of Lockheed Martin shouldering its way into other areas of space exploration, Price described the Space Launch System as critical to deep-space exploration. But he added that it

was important to stay flexible.

It is "prudent on us to try and mitigate risks everywhere we can for what kind of future ... there could be," Price said.

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