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SpaceX and Boeing are each in the final stages of developing the spacecraft needed for the U.S. to once again fly astronauts, with NASA's leader estimating launches may happen as early as the first months of 2020.

"I think both systems could be ready in the first quarter of next year," NASA Administrator Jim Bridenstine told CNBC on Thursday.

But, while SpaceX and Boeing may be close to completing work on their respective Crew Dragon and Starliner capsules, Bridenstine emphasized that the current timeline is very fluid given the critical nature of the final tests. Bridenstine spoke to CNBC following a briefing with SpaceX founder Elon Musk at the company's headquarters.

Bridenstine hopes to see both companies quickly reach the point of being able to safely launch NASA astronauts. The capsules are being built under NASA's Commercial Crew program, which is the agency's solution to end reliance on Russian Soyuz spacecraft. In 2014, NASA awarded contracts to SpaceX for up to $2.6 billion and Boeing for up to $4.2 billion. Future Commercial Crew contracts would be up for grabs, as NASA would look to buy seats on Boeing's Starliner capsule and SpaceX's Crew Dragon. Delays have plagued

the program, as NASA intended the first launches to happen as early as 2017.

As much as Bridenstine wants to see the first crewed flights come soon, he believes the schedule is much less important than the tests that remain.

“Whether it’s Starliner or Crew Dragon both these programs are still under development,” Bridenstine.

Boeing has yet to complete a launchpad emergency test, as well as fly Starliner to space without crew. SpaceX needs to re-certify Crew Dragon’s emergency rocket engines, after a test failure in April destroyed a capsule, and will complete a high altitude emergency flight test.

“Which means that, while we go through these test processes, we are going to learn things that need to be reviewed, where we need to take deeper dives, maybe make some modifications,” Bridenstine said. “So when I say the first quarter of next year for human spaceflight, what I mean is if things all go right. Things all going right is not the history when you talk about development programs”

A Boeing official on Wednesday revealed that the company plans to conduct its uncrewed test flight of Starliner on Dec. 17. Much like

SpaceX's Demo-1 mission in March, the flight to orbit represents a key milestone under the Commercial Crew program.

"Is December 17, the right date? I honestly don't know," Bridenstine said. "But I know that they are moving hardware very rapidly to get it to the Kennedy Space Center."

The agency began conducting safety reviews of both SpaceX and Boeing earlier this year, a process which includes interviews of hundreds of employees. The review came after Musk smoked marijuana during a videotaped podcast in September 2018. Musk's pot-smoking upset high level NASA officials, according to the Washington Post, causing the agency to conduct a cultural assessment study.

The reviews of both companies are ongoing, Bridenstine said. Asked whether the results will be made publicly available, Bridenstine said that will be at the companies' discretion.

"I'm going to get briefed by the end of the month" on the safety reviews, Bridenstine said.

"It's really for SpaceX, I mean, it is a safety review for them. If they want to make it public, I think that they should do that," Bridenstine added.

He emphasized that he doesn't think "there's much a story there" in the results of the safety reviews.

"Quite frankly, I think both companies are operating really responsibly, and making sure that their cultures are safe," Bridenstine said. "And so, as we get close to launching astronauts on rockets again, it's not just NASA that needs to be safe, it's our commercial partners that need to be safe."

One of the challenges facing all of NASA's current human spaceflight programs is the use of parachutes to slow spacecraft down as they come back to Earth.

"People think that parachutes are easy; they're really not," Bridenstine said.

"These parachutes affect SpaceX, and it affects Boeing and affects Lockheed Martin on Orion and affects all of our programs under development," Bridenstine said. "When we are learning we are sharing with all of our partners and they're all going to benefit and our parachutes will be the safest parachutes in history."

NASA has used parachutes as a braking method since the early days of human spaceflight over half a century ago. But Bridenstine said that one of the key lessons learned recently is “asymmetry in parachute deployment,” explaining how the agency better understands how tension is distributed among the parachutes’ cords.

“Historically, NASA would look at that and say ’okay, well, we will make sure that it has 1.1 times whatever the safety margin that we agreed on was,” Bridenstine said. “What we have learned is that the dynamics of that asymmetry is a lot worse than 1.1 times.”

That’s meant developing and testing new materials, to verify the parachutes can withstand the stress. SpaceX is working on a “Mark 3” series of parachutes, which Musk said “are possibly 10 times safer” than the parachutes the company was previously testing. But that will require the company to conduct more drop tests, where it releases a weight from an aircraft to simulate the parachutes opening above the spacecraft.

“We could see as many as 10 drop tests between now and the end of the year,” Bridenstine said. “And depending on how the next 10 drop tests go, we will know how many more drops tests we are going to add.”

“Some of those issues are important, but the highest priority has been the parachutes,” Bridenstine added. “And Elon has told me and he’s showed me now that that’s where their priority is, they are putting as much resources and manpower as they can and getting those parachutes ready.”