
Coverage of launch begins at
5:15 a.m EST
NASA

1
00:00:01,520 --> 00:00:04,290
\h Space shuttle Atlantis stands ready to launch the European-built

2
00:00:04,290 --> 00:00:08,210
\h Columbus laboratory to the International Space Station.

3
00:00:08,210 --> 00:00:12,620
\h The crew has arrived and the countdown is under way. Live from

4
00:00:12,620 --> 00:00:20,130
\h NASA's Kennedy Space Center in Florida, this is the STS-122 Mission Update.

5
00:00:20,130 --> 00:00:22,380
\h ALLARD BEUTEL: Good morning. Today is Wednesday, Feb. 6,

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00:00:22,380 --> 00:00:25,640
\h and you are looking live at Launch Pad 39A.

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00:00:25,640 --> 00:00:30,240
\h Space shuttle Atlantis stands pointed toward space and a rendezvous with the International Space Stati

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00:00:30,240 --> 00:00:33,540
\h I'm Allard Beutel, NASA news chief here at Kennedy.

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00:00:33,540 --> 00:00:37,190
\h Thanks for joining us this morning before the launch of STS-122.

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00:00:37,190 --> 00:00:40,800
\h This is an exciting time for NASA as the agency launches its first mission

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00:00:40,800 --> 00:00:44,490
\h of the year and adds a critical piece to the International Space Station.

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00:00:44,490 --> 00:00:48,710
\h The seven astronauts who will fly aboard Atlantis arrived here on Monday and the

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00:00:48,710 --> 00:00:53,780

\h countdown is moving methodically toward a 2:45 p.m. Eastern time
liftoff tomorrow.

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00:00:53,780 --> 00:00:57,560
\h Commander Steve Frick and his crew will eat breakfast just before sunrise on launch day

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00:00:57,560 --> 00:01:02,110
\h before putting on their orange pressure suits and heading to the launch pad.

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00:01:02,110 --> 00:01:05,300
\h This is exactly the same thing they would have done in December

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00:01:05,300 --> 00:01:08,420
\h if a faulty connector in the engine cutoff system had not delayed

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00:01:08,420 --> 00:01:12,870
\h two launch attempts before the external tank was completely filled in December.

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00:01:12,870 --> 00:01:15,920
\h Joining us this morning we have NASA Test Director Steve Payne to talk

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00:01:15,920 --> 00:01:20,000
\h about that exact fix and what we're going to do now. Steve, thanks for joining us.

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00:01:20,000 --> 00:01:21,180
\h STEVE PAYNE: Thank you. Good morning.

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00:01:21,180 --> 00:01:26,550
\h BEUTEL: And just in case people don't know what a NASA test director does or is,

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00:01:26,550 --> 00:01:29,500
\h besides you, what do you guys do for us?

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00:01:29,500 --> 00:01:32,740
\h PAYNE: Well, the NASA test directors are responsible for the planning and

25
00:01:32,740 --> 00:01:37,640
\h execution of the shuttle launch countdowns. So we, in effect, orchestrate and run the countdown.

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00:01:37,640 --> 00:01:40,040
\h BEUTEL: And which is going really well right now.

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00:01:40,040 --> 00:01:41,040
\h PAYNE: So far, so good.

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00:01:41,040 --> 00:01:45,470
\h BEUTEL: Well, let's see. We call it here at NASA the engine cutoff system. It goes by the acronym ECO

29
00:01:45,470 --> 00:01:49,490
\h What is it and why do we need it?

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00:01:49,490 --> 00:01:55,570
\h PAYNE: Well, the engine cutoff system is one of two methods by which we tell the main engines when t

31
00:01:55,570 --> 00:01:59,360
\h The computers on the main engine controllers are the primary system and they,

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00:01:59,360 --> 00:02:04,240
\h after a certain amount of time, tell the engines it's time to shut down.

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00:02:04,240 --> 00:02:07,650
\h The backup system is this engine cutoff system and it consists of a number

34
00:02:07,650 --> 00:02:10,060
\h of sensors on the bottom of the external tank that,

35
00:02:10,060 --> 00:02:16,310
\h when they register that they are dry, they pass the signal to the engine controller to shut down.

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00:02:16,310 --> 00:02:19,360
\h BEUTEL: And we've had some intermittent problems with them.

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00:02:19,360 --> 00:02:21,840
\h PAYNE: Yes we have.

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00:02:21,840 --> 00:02:25,830
\h BEUTEL: And as anybody knows with a car or any kind of problem like that, something that's

39
00:02:25,830 --> 00:02:29,400
\h intermittent, that's some of the worst problems to deal with because you take it in,

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00:02:29,400 --> 00:02:32,900
\h it's suddenly working, and that's what we had with several flights.

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00:02:32,900 --> 00:02:36,850
\h PAYNE: That's true. This was an unexplained problem for a couple of missions.

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00:02:36,850 --> 00:02:38,920
\h We struggled to find out where the source was.

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00:02:38,920 --> 00:02:43,850
\h We thought initially that the sensors themselves were bad, but we couldn't find the source.

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00:02:43,850 --> 00:02:49,080
\h Fortunately, or unfortunately, this last mission we were able to finally determine where the fault lay.

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00:02:49,080 --> 00:02:51,110
\h BEUTEL: And speaking of which, we happen to have what we think is

46
00:02:51,110 --> 00:02:56,390
\h actually where the fault lay, and in this case, what did you do to fix it? And what is this?

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00:02:56,390 --> 00:03:00,470
\h PAYNE: Well, this is the feedthrough connector that goes between the

48
00:03:00,470 --> 00:03:04,580
\h inside of the external tank and the outside of the external tank.

49
00:03:04,580 --> 00:03:08,930
\h And there's a connector on either side that connects on the inside to the engine cutoff

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00:03:08,930 --> 00:03:10,760
\h sensors at the bottom of the tank,

51
00:03:10,760 --> 00:03:16,530
\h and on the outside to the avionics on the orbiter. What we found is that once

52
00:03:16,530 --> 00:03:21,000
\h we cooled the inside connector by filling the inside of the tank with liquid

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00:03:21,000 --> 00:03:25,660
\h hydrogen, the outside part of the connector would also get cold and the

54
00:03:25,660 --> 00:03:30,910
\h airspace between the socket and the pins of the connector would,

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00:03:30,910 --> 00:03:36,050
\h the air inside would freeze and it would be an insulator between the two metal parts.

56
00:03:36,050 --> 00:03:39,000
\h And so we'd have intermittent signals coming and going.

57
00:03:39,000 --> 00:03:44,300
\h What was fortunate about the failure we saw last time is that we had many failing at the same time,

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00:03:44,300 --> 00:03:47,980
\h which pointed directly to this being the cause of the problem.

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00:03:47,980 --> 00:03:50,960
\h BEUTEL: And in that particular case, what did you guys do to fix it?

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00:03:50,960 --> 00:03:56,620
\h PAYNE: Well, what we did, we did a little research and found that our folks

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00:03:56,620 --> 00:04:01,190
\h across the river in the Atlas/Centaur Program had a very similar,

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00:04:01,190 --> 00:04:05,090
\h identical problem practically. In their tank, they had the same issue with intermittent signals.

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00:04:05,090 --> 00:04:12,020
\h What they have done, they removed that airspace by soldering the pins to the sockets.

64
00:04:12,020 --> 00:04:13,970
\h There's a video you're watching now.

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00:04:13,970 --> 00:04:18,430
\h We removed our feedthrough connector and the external connector,

66
00:04:18,430 --> 00:04:25,320
\h cut it off, spliced in a new one which was soldered solidly between the feedthrough and the connector.

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00:04:25,320 --> 00:04:29,890
\h That way there was metal to metal to metal contact and we no longer had the problem

68
00:04:29,890 --> 00:04:33,860
\h with air freezing inside and having an intermittent connection.

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00:04:33,860 --> 00:04:37,120
\h BEUTEL: And anyone at home who doesn't know about spaceflight hardware and the time

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00:04:37,120 --> 00:04:43,070
\h it takes to do these fixes, you think, okay, it took you two months to be able to do that.

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00:04:43,070 --> 00:04:47,930
\h But actually, when it comes to spaceflight hardware and modifications, that's pretty quick.

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00:04:47,930 --> 00:04:52,360
\h PAYNE: That was pretty quick. Fortunately, we had a couple of missions we've seen this,

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00:04:52,360 --> 00:04:56,270
\h we didn't understand it but we had some data we had gathered. On the initial

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00:04:56,270 --> 00:04:59,790
\h couple of launch attempts for STS-122, we gathered a lot more data.

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00:04:59,790 --> 00:05:02,400
\h And then we had a tanking test we performed in December,

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00:05:02,400 --> 00:05:05,330
\h where we put instrumentation along the data path back and forth,

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00:05:05,330 --> 00:05:09,320
\h and we were able to isolate it to this one connector.

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00:05:09,320 --> 00:05:12,570
\h That was the smoking gun we were looking for and we were able

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00:05:12,570 --> 00:05:15,170
\h to get the solution from our friends across the river.

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00:05:15,170 --> 00:05:19,470
\h BEUTEL: So other than having Atlantis safely in orbit and heading to the space station,

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00:05:19,470 --> 00:05:22,660
\h when will you know that you really have gotten the fix done?

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00:05:22,660 --> 00:05:26,600
\h PAYNE: Well, we're pretty confident that this is the fix. Everything else had worked.

83
00:05:26,600 --> 00:05:30,460
\h We isolated to this and we implemented a known good fix.

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00:05:30,460 --> 00:05:34,080
\h But we'll know for sure after we tank on Thursday morning and

85
00:05:34,080 --> 00:05:37,160
\h give the system enough time to cool down.

86
00:05:37,160 --> 00:05:39,720
\h Once we get beyond the point at which we would have seen these

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00:05:39,720 --> 00:05:41,610
\h intermittent connections, we should be home free.

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00:05:41,610 --> 00:05:44,740
\h BEUTEL: A lot of news reports came out last week;

89
00:05:44,740 --> 00:05:47,920
\h we had another thing crop up that people may have heard about,

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00:05:47,920 --> 00:05:51,810
\h flexible hoses in the cooling system for Atlantis. Tell me about those.

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00:05:51,810 --> 00:05:57,250
\h PAYNE: Out in space, you have to reject your heat through radiators in the payload bay doors.

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00:05:57,250 --> 00:06:03,150
\h And the way that it works, we have Freon that flows through plates under our avionics,

93
00:06:03,150 --> 00:06:06,890
\h our electrical boxes, and they take the heat
away, and we send it to via some

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00:06:06,890 --> 00:06:11,760
\h
hoses to the radiator panels on the doors. I believe we have video on the closing of our payload bay doors.

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00:06:11,760 --> 00:06:16,280
\h You see the radiators on either side of our Columbus module.

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00:06:16,280 --> 00:06:23,880
\h There's a hose that carries the Freon from the body of the orbiter into these radiator panels,

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00:06:23,880 --> 00:06:26,560
\h and when we closed the right side door, the starboard door,

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00:06:26,560 --> 00:06:30,210
\h we noticed that the hose was not retracting into its box like it should have.

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00:06:30,210 --> 00:06:36,420
\h In fact, it was bending. And you'll hear the term "omega bend," which is much like the Greek letter Omeg

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00:06:36,420 --> 00:06:42,230
\h where rather than go into its case, it bent some.

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00:06:42,230 --> 00:06:47,040
\h We have analyzed it and, in fact, here you see here, we used this homemade

102
00:06:47,040 --> 00:06:51,170
\h pole where we guided the hose back into its proper location.

103
00:06:51,170 --> 00:06:56,260
\h We feel it's fairly safe to do and we don't expect to have any problems with this hose.

104
00:06:56,260 --> 00:06:59,480
\h It's been X-rayed and leak checked and we've had these in

105
00:06:59,480 --> 00:07:03,370
\h previous flights without any issue. So we have no concerns about it for this particular flight.

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00:07:03,370 --> 00:07:05,820
\h BEUTEL: And just have to mention that pole for a second.

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00:07:05,820 --> 00:07:08,310
\h It looks suspiciously like a pool skimmer pole.

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00:07:08,310 --> 00:07:12,730
\h PAYNE: It looks a whole lot like a pool skimmer pole with some padding on it and some tape.

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00:07:12,730 --> 00:07:15,580
\h BEUTEL: I guess sometimes the best solutions are the simplest ones.

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00:07:15,580 --> 00:07:16,970
\h PAYNE: Absolutely.

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00:07:16,970 --> 00:07:21,450
\h BEUTEL: Actually, in that video, as well, we saw the Columbus laboratory.

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00:07:21,450 --> 00:07:23,460
\h How has it held up in the past couple of months?

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00:07:23,460 --> 00:07:28,240
\h PAYNE: It has had a fairly easy time since they were ready to go during the first couple of launch attem

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00:07:28,240 --> 00:07:33,290
\h All they've really had to do is maintain a clean gas purge on their equipment to make sure it didn't get di

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00:07:33,290 --> 00:07:37,490
\h They replaced the covers on the optics to make sure none of that got dust on it

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00:07:37,490 --> 00:07:40,510
\h But otherwise, they haven't had a whole lot else to do.

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00:07:40,510 --> 00:07:43,040
\h BEUTEL: Alright, well, Stephen, we appreciate you coming down and

118
00:07:43,040 --> 00:07:44,880
\h giving us a quick update on where we are,

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00:07:44,880 --> 00:07:46,410
\h and we're in a good position to launch tomorrow, aren't we?

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00:07:46,410 --> 00:07:47,320
\h PAYNE: Absolutely.

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00:07:47,320 --> 00:07:49,870
\h BEUTEL: And from your words to the launch director's ear.

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00:07:49,870 --> 00:07:55,140
\h A reminder now to stay with nasa.gov and NASA TV for all your mission information.

123
00:07:55,140 --> 00:08:01,320
\h Launch coverage begins tomorrow at 5:15 a.m. Eastern on NASA TV and continues through liftoff.

124
00:08:01,320 --> 00:08:06,300
\h You can also log on to www.nasa.gov/shuttle for continuous updates

125

00:08:06,300 --> 00:08:08,350
\h of the countdown on our launch blog.

126
00:08:08,350 --> 00:08:11,910
\h There will also be video highlights and stunning photographs of the liftoff.