
frameworks

1
00:00:09,600 --> 00:00:16,160
2020 was a banner year for NASA's commercial crew\h
program, restoring the nation's capability to\h\h

2
00:00:16,160 --> 00:00:22,000
launch astronauts into orbit from American\h
soil, all while working through a pandemic\h\h

3
00:00:22,000 --> 00:00:28,880
and managing a colossal balancing act between\h
work and family. Now, NASA is on the cusp of\h\h

4
00:00:28,880 --> 00:00:35,120
launching the next crew rotation mission to the\h
international space station, known as Crew-2.\h

5
00:00:36,240 --> 00:00:41,200
The Rocket Ranch welcomes Dana Hutcherson,\h
deputy manager for the program.\h\h

6
00:00:41,200 --> 00:00:46,400
She'll talk about the mission ahead,\h
reflect on the program's 10-year anniversary\h\h

7
00:00:46,400 --> 00:00:50,560
and share her personal journey from\h
supporting the space shuttle program\h\h

8
00:00:50,560 --> 00:00:55,520
to the new commercial model. I'm Marie\h
Lewis, and this is The Rocket Ranch.

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00:00:57,040 --> 00:01:00,800
EGS Program Chief Engineer,\h
verify no constraints to launch.\h

10
00:01:00,800 --> 00:01:04,560
Three, two, one, and lift off.
Welcome to space.

11
00:01:09,440 --> 00:01:12,560
So Dana, welcome. Thanks for being here with us.

12
00:01:12,560 --> 00:01:14,480
Thank you for having me. I appreciate it.

13
00:01:14,480 --> 00:01:18,160
It's a really exciting time, so I just\h
want to jump right in and talk about all\h\h

14
00:01:18,160 --> 00:01:22,240
the things that are coming up.
We've got the next crew launch.\h\h

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00:01:22,240 --> 00:01:26,080
We've got four astronauts getting ready to\h
launch to the international space station.\h\h

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00:01:26,080 --> 00:01:31,600
We know this as Crew-2 because it's the\h
second crew rotation mission to space station.\h\h

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00:01:32,480 --> 00:01:36,320
What do you want people to know about\h
this mission? What are the big takeaways?

18
00:01:36,320 --> 00:01:40,800
Well, as you mentioned, this is Crew-2, as we\h
call it. This will be our second operational\h\h

19
00:01:40,800 --> 00:01:46,400
mission where we're taking crews back up to the\h
international space station, launching once again\h\h

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00:01:46,400 --> 00:01:52,160
from the US, so another proud time in our American\h
history, I think, for being able to have that\h\h

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00:01:52,160 --> 00:01:57,280

routine operational mission and that capability\h
to launch these astronauts back from the US.\h

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00:01:57,280 --> 00:02:01,680
I would say this is really crucial for\h
SpaceX as well. This is their second\h\h

23
00:02:01,680 --> 00:02:07,840
operational mission to the space station.\h
It kind of demonstrates their repeatability\h\h

24
00:02:07,840 --> 00:02:13,360
and being able to launch these missions back to\h
back, and so it's a really awesome time for us.\h

25
00:02:14,640 --> 00:02:20,080
You know, we're delivering the four veteran space\h
flight members that are going to the international\h\h

26
00:02:20,080 --> 00:02:24,400
space station. So they've all been in space\h
flight before, they're not new to this. But\h\h

27
00:02:25,120 --> 00:02:30,640
it's always welcome that they get to ride aboard\h
a new spacecraft and get to the space station.\h

28
00:02:31,200 --> 00:02:37,440
One of the interesting things about this flight,\h
too, is that we are reusing the Dragon capsule\h\h

29
00:02:37,440 --> 00:02:43,360
and the Falcon 9 rocket as well in this mission.\h
So this will be the first time that we get to see\h\h

30
00:02:43,360 --> 00:02:47,920
a reused vehicle being used for\h
these private commercial missions.\h

31
00:02:49,360 --> 00:02:54,400

It's interesting you brought that up, the\h
reuse part, this Dragon capsule that the\h\h

32
00:02:54,400 --> 00:02:58,800
Crew-2 astronauts will be flying on, and, of\h
course, we're talking about Shane Kimbrough,\h\h

33
00:02:58,800 --> 00:03:05,280
Megan McArthur, JAXA astronaut Aki\h
Hoshide and ESA astronaut Thomas Pesquet.\h\h

34
00:03:05,280 --> 00:03:11,760
The Dragon capsule there'll be in is the Crew\h
Dragon Endeavour, which is the same Crew Dragon\h\h

35
00:03:11,760 --> 00:03:18,080
that NASA astronauts, Bob Behnken and Doug Hurley\h
flew in, in the Demo-2 test flight last year.\h

36
00:03:18,080 --> 00:03:22,880
When I was reading about some of the work you've\h
done, you worked on the space shuttle Endeavour\h\h

37
00:03:23,600 --> 00:03:27,520
years ago. We know Shane Kimbrough\h
flew on Space Shuttle Endeavour,\h\h

38
00:03:27,520 --> 00:03:33,760
and now you're both working on and supporting a\h
new endeavour, this one being the Crew Dragon,\h\h

39
00:03:33,760 --> 00:03:40,400
and one that Bob and Doug already flew in.\h
Talk to me about that, kind of that coming full\h\h

40
00:03:40,400 --> 00:03:46,320
circle with a new generation of spacecraft.
It is. It is coming full circle. You know,\h\h

41
00:03:46,320 --> 00:03:52,080

when they named the Dragon spacecraft Endeavour\h
last year, I was so excited. I was like, "Oh,\h\h

42
00:03:52,080 --> 00:03:58,320
this is great," because I spent so much of my\h
time working on the Space Shuttle Endeavour back\h\h

43
00:03:58,960 --> 00:04:04,720
in the shuttle days. Particularly the last three\h
missions, I was the flow director for Space\h\h

44
00:04:04,720 --> 00:04:10,480
Shuttle Endeavour. So I was overseeing all of\h
the operations that happen from landing to launch\h\h

45
00:04:10,480 --> 00:04:17,520
getting the Space Shuttle Endeavour prepared.\h
Not only the shuttle, but the boosters, as well\h\h

46
00:04:17,520 --> 00:04:24,240
as the solid rocket motors and the external tank.
So it was a fun time for me to be able to lead a\h\h

47
00:04:24,240 --> 00:04:31,040
vast team of really awesome people and getting the\h
Endeavour ready for those space shuttle flights.\h\h

48
00:04:32,080 --> 00:04:38,080
But now I've come full circle and getting to\h
work on another Endeavour, the Dragon spacecraft.

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00:04:38,080 --> 00:04:42,080
You talked about your past working on the Space\h
Shuttle Endeavour. Obviously, you're working\h\h

50
00:04:42,080 --> 00:04:48,240
on launching the next crew in the Crew Dragon\h
Endeavour now. What was that transition like for\h\h

51
00:04:48,240 --> 00:04:53,600

you from the shuttle program to commercial crew?\h
I know that was a big paradigm shift for NASA.

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00:04:54,560 --> 00:04:59,600
At the end of shuttle, I realized that I had\h
a huge career left at NASA, and so I needed\h\h

53
00:04:59,600 --> 00:05:05,840
to try to look for some opportunity. What am I\h
passionate about? What do I want to go and do?\h\h

54
00:05:07,200 --> 00:05:14,240
In talking around with various programs around the\h
center at the time, I heard about the commercial\h\h

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00:05:14,240 --> 00:05:20,400
crew program. What piqued my interest about\h
the commercial crew program was more continuing\h\h

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00:05:20,400 --> 00:05:24,320
to work on that human space flight. That was\h
something that I was really passionate about.\h

57
00:05:24,960 --> 00:05:30,720
But what also interested me was how we were\h
doing things differently. It was a culture shift.\h\h

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00:05:30,720 --> 00:05:35,280
It was going to be something different than\h
NASA is used to where we're working with these\h\h

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00:05:35,280 --> 00:05:40,800
public-private partnerships and trying to\h
develop rockets, develop something that NASA\h\h

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00:05:40,800 --> 00:05:45,760
has inherently done in the past, but maybe it's\h
an opportunity to allow these private companies\h\h

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00:05:45,760 --> 00:05:54,080

to be able to launch Americans from the US again\h
and then we can focus NASA's energies on some of\h\h

62
00:05:54,080 --> 00:06:00,240
the bigger projects, moon, Mars and some of those\h
other programs that we need our expertise for.\h

63
00:06:00,240 --> 00:06:06,480
What's really cool is to be able to continue\h
to use our NASA expertise to help these private\h\h

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00:06:06,480 --> 00:06:14,640
companies. So we weren't just letting them off\h
just working in a vacuum. We are side by side,\h\h

65
00:06:14,640 --> 00:06:19,440
hand in hand, working with them on helping them\h
develop and design their rockets. But inherently,\h\h

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00:06:19,440 --> 00:06:24,480
it's still their design, it's still their rocket,\h
and they have to meet our NASA requirements.\h

67
00:06:25,040 --> 00:06:30,880
So you're absolutely right. It was a shift for us\h
in NASA, but it was something cool that I really\h\h

68
00:06:30,880 --> 00:06:36,160
was passionate about working on and making a new\h
name for NASA and something that actually there\h\h

69
00:06:36,160 --> 00:06:43,360
are other programs out there studying us and using\h
our lessons learned in trying to develop their own\h\h

70
00:06:43,360 --> 00:06:47,840
programs to try to mimic some of the things\h
that we've learned in the last several years.

71
00:06:49,040 --> 00:06:54,400

We're now only a couple of weeks from\h
launch. Can you talk about the work that\h\h

72
00:06:54,400 --> 00:07:01,520
your teams are doing now, and also reflect on\h
the work of the last 10 years? Because another\h\h

73
00:07:01,520 --> 00:07:06,800
really interesting bit of trivia for folks who've\h
been following the commercial crew program is that\h\h

74
00:07:06,800 --> 00:07:12,080
you are celebrating the 10-year anniversary\h
of the program's inception on April 5th.

75
00:07:12,880 --> 00:07:16,640
Absolutely. Let me start with the 10 years\h
because that's really something I'm super\h\h

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00:07:16,640 --> 00:07:21,440
passionate about, too, is that I've been in\h
this program for almost 10 years. I came over\h\h

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00:07:22,000 --> 00:07:27,680
as soon as space shuttle Endeavour landed from its\h
final flight, and I came over and started working\h\h

78
00:07:27,680 --> 00:07:33,120
in the commercial crew program, getting my feet\h
wet in what this new program was doing. So I have,\h\h

79
00:07:33,120 --> 00:07:39,040
literally, been here for almost 10 years working\h
with this program and just seeing the people on\h\h

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00:07:39,040 --> 00:07:43,600
the team that we have and what they're capable of\h
doing, and then the new advances and the things\h\h

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00:07:43,600 --> 00:07:48,720

that both Boeing and SpaceX have been able to\h
do, allowing them to design and build their own\h\h

82
00:07:48,720 --> 00:07:56,800
rockets. So in the 10 years, I look back at it, I\h
feel like it was yesterday. Time has really flown\h\h

83
00:07:56,800 --> 00:08:01,920
by for us, but we've done some amazing things.
And, like I said, there's other programs that are\h\h

84
00:08:01,920 --> 00:08:07,680
looking at some of the studies, the testing that\h
we've done. They're very interested in what our\h\h

85
00:08:07,680 --> 00:08:12,080
partners are doing, both Boeing and SpaceX and the\h
things that they're accomplishing and wanting to\h\h

86
00:08:12,080 --> 00:08:19,840
learn more from them as well. So 10 years has been\h
quite a long time when you think about it, but\h\h

87
00:08:19,840 --> 00:08:24,480
it's flown by so fast. And we've just worked with\h
not only just Boeing and SpaceX, we've worked with\h\h

88
00:08:24,480 --> 00:08:30,320
other companies throughout our history as well\h
on helping them design space flight systems, too.

89
00:08:31,520 --> 00:08:37,440
Focusing more specifically on the work that's\h
ahead in these last couple of weeks before launch.

90
00:08:37,440 --> 00:08:43,680
Yeah, so Crew-2 leading up to this mission. This\h
time right now, we're wrapping up all of our\h\h

91
00:08:44,480 --> 00:08:51,280

documentation, I would say. SpaceX is working on\h
closing out and finalizing all their testing on\h\h

92
00:08:51,280 --> 00:08:57,440
getting the maintenance of the vehicle done and\h
complete refurbishment of the boosters happening\h\h

93
00:08:57,440 --> 00:09:03,920
and they're closing out on that, as well as we're\h
getting ready for all of our readiness reviews to\h\h

94
00:09:03,920 --> 00:09:08,080
where we make sure we go through all of our\h
checklists of everything that we've done\h\h

95
00:09:08,080 --> 00:09:12,400
and make sure we haven't missed anything. So we're\h
kind of at the point now where we're wrapping up\h\h

96
00:09:12,400 --> 00:09:16,320
everything and getting ready for this,\h
button up everything for this flight.\h

97
00:09:16,960 --> 00:09:22,800
The crews, they're wrapping up their training\h
with SpaceX and then they're preparing their\h\h

98
00:09:23,680 --> 00:09:27,360
additional training they need to do for the\h
international space station once they're up there.\h\h

99
00:09:27,360 --> 00:09:32,960
So the crews are also getting ready. They're\h
doing their final checks. We're going to\h\h

100
00:09:32,960 --> 00:09:39,040
be doing some simulations as well. This is\h
where the team exercises different scenarios,\h\h

101
00:09:39,040 --> 00:09:41,360

making sure we're all tested\h
and we're ready for flight.

102
00:09:42,000 --> 00:09:45,920
When Crew-2 launches in a couple of\h
weeks, the plan is that they will\h\h

103
00:09:45,920 --> 00:09:50,640
arrive at the international space\h
station before the Crew-1 crew\h\h

104
00:09:51,760 --> 00:09:59,040
departs from the space station and comes home. We\h
call it a direct handover. Why is that important?

105
00:09:59,600 --> 00:10:03,840
What's really important is to have that\h
US presence on the space station at all\h\h

106
00:10:03,840 --> 00:10:06,480
times. It's really important for the space station\h\h

107
00:10:06,480 --> 00:10:10,560
to maintain their research, their science, all\h
of their capabilities that they have going.\h\h

108
00:10:10,560 --> 00:10:15,920
We want to maintain that US presence up on the\h
space station, so we want to make sure that we\h\h

109
00:10:15,920 --> 00:10:20,160
don't have a gap. I think that's the most\h
important to us is to making sure that\h\h

110
00:10:20,160 --> 00:10:27,120
we can get our next crew up there and ready and\h
trained so that there is no gap between our crews\h\h

111
00:10:27,920 --> 00:10:32,160
to be able to continue that research and that\h

science, the stuff that's really important.\h

112
00:10:32,160 --> 00:10:36,320
You mentioned a little bit, I'll go back, about\h
the difference in space shuttle and what we're\h\h

113
00:10:36,320 --> 00:10:41,760
doing now. In the past in space shuttle, we are\h
helping to architect and build the space station.\h\h

114
00:10:41,760 --> 00:10:46,560
Now we're focused a lot on the research and the\h
science and to be doing these studies that can\h\h

115
00:10:46,560 --> 00:10:52,400
help us maintain that long presence with humans\h
aboard the space station. So we want to make sure\h\h

116
00:10:52,400 --> 00:10:56,640
that we can continue that presence on those space\h
station and continue that research and studies.

117
00:10:57,360 --> 00:11:00,720
You mentioned all of the reviews that\h
are going to be going on over the next\h\h

118
00:11:00,720 --> 00:11:04,240
couple of weeks leading up to launch. I\h
think it's also important for people to\h\h

119
00:11:04,240 --> 00:11:09,600
know that you're also working on the return\h
plans for the Crew-1 astronauts in tandem.

120
00:11:10,160 --> 00:11:18,720
That's correct. We look at our return scenarios.\h
We look at all that actually when we're going to\h\h

121
00:11:18,720 --> 00:11:22,720
launch, too. So back in November, even\h

when we were preparing for the launch,\h\h

122
00:11:22,720 --> 00:11:27,840
we wanted to make sure that we are ready to\h
land given any opportunity that we needed to\h\h

123
00:11:28,800 --> 00:11:34,720
during the whole mission. So we prepare a\h
lot of our efforts back, even when we launch.\h

124
00:11:34,720 --> 00:11:38,160
But you're right. Once again, we're\h
exercising that, we're practicing all of our\h\h

125
00:11:38,880 --> 00:11:45,760
landing. We actually do some recovery training.\h
We do a lot of the additional sequences and last\h\h

126
00:11:45,760 --> 00:11:50,640
final steps that we need to, to prepare for that\h
return of that crew as well. So we're kind of\h\h

127
00:11:50,640 --> 00:11:56,240
doing that in tandem, in parallel and making sure\h
that we have, like I said, maintained all of our\h\h

128
00:11:56,240 --> 00:12:00,320
checklists and done all of our checkouts\h
of the hardware, getting ready for that.

129
00:12:01,120 --> 00:12:07,200
I want to ask you also about just the dedication\h
of the people that work on this program.\h\h

130
00:12:07,200 --> 00:12:13,040
I know as far as NASA as an agency goes, the\h
commercial crew program is a pretty lean team.\h\h

131
00:12:14,480 --> 00:12:19,680
And I know you guys have faced, I hate to use\h

the word unprecedented because it's kind of\h\h

132
00:12:19,680 --> 00:12:23,840
overused this past year, but it truly\h
is unprecedented, all the challenges\h\h

133
00:12:24,400 --> 00:12:34,560
that you faced as a team a full year now,\h
launching Demo-2 in the beginning of the pandemic,\h\h

134
00:12:34,560 --> 00:12:40,960
we're a year into it now. Not only was Demo-2 a\h
success, we have the successful launch of Crew-1\h\h

135
00:12:40,960 --> 00:12:47,360
getting ready to bring them home after we\h
launched Crew-2. So it seems like none of\h\h

136
00:12:47,360 --> 00:12:54,960
this work has slowed down, even in the midst of\h
global unrest, health epidemic, social unrest.\h\h

137
00:12:56,320 --> 00:13:01,920
How has the team been able to do that with\h
all of these external pressures all around us?

138
00:13:01,920 --> 00:13:08,880
It is very true. I'm so proud of being a part of\h
this team, being able to lead this team. It is\h\h

139
00:13:08,880 --> 00:13:15,120
unbelievable what we've done in the last year.\h
And particularly being able to launch our first\h\h

140
00:13:15,120 --> 00:13:21,680
crewed mission during a pandemic, just months in\h
actually. Our teams were at this stage getting\h\h

141
00:13:21,680 --> 00:13:26,720
ready for flight right now, we were still trying\h

to figure out, are people working from home? Are\h\h

142
00:13:26,720 --> 00:13:33,040
they coming into an office or how are we going to\h
handle all this? Our team adapted very quickly,\h\h

143
00:13:35,120 --> 00:13:40,240
most of our team works from various centers\h
anyway. So on a daily basis, we're used to\h\h

144
00:13:40,240 --> 00:13:45,840
talking to each other on teleconferences. Maybe\h
not so much on some of the virtual applications\h\h

145
00:13:45,840 --> 00:13:52,400
that we've got in place now, but we are used\h
to working virtually and across centers and\h\h

146
00:13:52,400 --> 00:13:57,920
having meetings with our fellow folks across\h
another center. So our team adapted really\h\h

147
00:13:57,920 --> 00:14:01,840
quickly to that, and it's just amazing to see\h
what they can do and what they were able to do.\h

148
00:14:02,720 --> 00:14:10,480
Then to launch that Demo-2 mission with Bob and\h
Doug last year, and to see that accomplishment and\h\h

149
00:14:10,480 --> 00:14:14,880
then to look around at our neighbors, our friends\h
and everyone, and they're talking about it,\h\h

150
00:14:16,800 --> 00:14:22,960
it was just a bright spot in our country,\h
across the world actually, during that time,\h\h

151
00:14:22,960 --> 00:14:28,800
and to be able to be a part of that. It was\h

really cool to see our team come together.\h

152
00:14:29,760 --> 00:14:35,840
You mentioned we do have a small program, it's\h
very true. They're all rock stars in my mind,\h\h

153
00:14:36,560 --> 00:14:41,440
every one of them. Even the folks that are\h
supporting a little bit of engineering time\h\h

154
00:14:41,440 --> 00:14:46,880
here and there, they're all making this happen.\h
And to have those accomplishments of launching,\h\h

155
00:14:48,240 --> 00:14:51,600
it just says something for\h
the dedication of our team.

156
00:14:51,600 --> 00:14:54,320
Well, congratulations to you\h
and your team. Well-deserved.

157
00:14:54,320 --> 00:14:54,640
Thank you.

158
00:14:56,000 --> 00:14:59,600
Final questions for you. Where\h
will you be on launch day?

159
00:15:00,400 --> 00:15:02,880
I will be in one of the support control rooms\h\h

160
00:15:04,400 --> 00:15:08,800
during launch and kind of monitoring all the\h
systems, monitoring everything as it's going.\h\h

161
00:15:09,600 --> 00:15:13,040
Hopefully I will get to sneak out a little\h
bit and be able to see the actual launch.\h

162
00:15:13,040 --> 00:15:18,240
But it's one of those times where you want to\h
make sure everything is going well and checking,\h\h

163
00:15:18,960 --> 00:15:25,280
but you're also have that anxious anxiety going\h
on as well. You're never taking a deep breath\h\h

164
00:15:25,280 --> 00:15:30,240
until they open up the hatch and you see the\h
astronauts go through and get up there to the\h\h

165
00:15:30,240 --> 00:15:36,640
international space station safely. So it is a\h
time where we're excited for what's happening,\h\h

166
00:15:36,640 --> 00:15:43,360
but it's also very cool to be able to go back\h
home and then talk with all your neighbors and\h\h

167
00:15:43,360 --> 00:15:47,520
friends and everybody who's seen exactly what\h
these special people have been able to do.

168
00:15:48,800 --> 00:15:53,680
Dana Hutcherson, thank you so much. Wishing\h
you and the entire NASA and SpaceX teams\h\h

169
00:15:53,680 --> 00:15:56,480
the best of luck on this upcoming Crew-2 mission.

170
00:15:56,480 --> 00:15:57,760
Thank you. Thank you for having me.

171
00:15:59,680 --> 00:16:05,280
A special thanks to Dana Hutcherson, deputy\h
manager for NASA's commercial crew program.\h\h

172
00:16:05,280 --> 00:16:10,560

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173
00:16:12,640 --> 00:16:16,800
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174
00:16:16,800 --> 00:16:23,760
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