



1

00:00:05,700 --> 00:00:08,490

>>> HELLO, EVERYONE, AND WELCOME
TO TODAY'S UPDATE ON THE

2

00:00:08,490 --> 00:00:12,740

PROGRESS BEING MADE ON THE ORION
AHEAD OF ITS FIRST TRIP TO SPACE

3

00:00:12,740 --> 00:00:15,900

LATER THIS YEAR.
HERE AT KENNEDY SPACE CENTER,

4

00:00:15,900 --> 00:00:19,330

ORION'S HEAT SHIELD WAS RECENTLY
ATTACHED TO THE CREW MODULE.

5

00:00:19,330 --> 00:00:21,750

AND JUST LAST WEEK IT WAS
STACKED ON TOP OF THE SERVICE

6

00:00:21,750 --> 00:00:26,820

MODULE, MARKING TWO SIGNIFICANT
STEPS TOWARDS ITS FLIGHT TEST

7

00:00:26,820 --> 00:00:29,730

AND DEVELOPING THE SPACECRAFT
THAT WILL EVENTUALLY SEND HUMANS

8

00:00:29,730 --> 00:00:32,380

TO MARS.
TO TALK ABOUT THE PROGRESS BEING

9

00:00:32,380 --> 00:00:36,120

MADE HERE AND TO HIGHLIGHT THE
UPCOMING FLIGHT TESTS ARE NASA

10

00:00:36,120 --> 00:00:39,930

ADMINISTRATOR CHARLIE BOLDEN,
ORION PROGRAM MANAGER MARK

11
00:00:39,930 --> 00:00:45,120
GEYER, LOCKHEED MARTIN'S ORION
PROGRAM MANAGER CLEON LACEFIELD

12
00:00:45,120 --> 00:00:48,420
AND KENNEDY SPACE CENTER
DIRECTOR BOB CABANA.

13
00:00:48,420 --> 00:00:52,310
FOR THOSE OF YOU WATCHING ON TV
OR THROUGH THE WEB TODAY, WE'LL

14
00:00:52,310 --> 00:00:55,170
TAKE QUESTIONS FROM YOU VIA
SOCIAL MEDIA.

15
00:00:55,170 --> 00:00:59,690
YOU CAN ASK QUESTIONS USING
THE #ASKNASA.

16
00:00:59,690 --> 00:01:02,390
AND WE'LL START OFF WITH A FEW
OPENING REMARKS.

17
00:01:02,390 --> 00:01:05,900
SO CHARLIE, IF YOU'D LIKE TO
START US OFF.

18
00:01:05,900 --> 00:01:07,829
>> THANK YOU.
FIRST OF ALL, THANKS VERY MUCH

19
00:01:07,829 --> 00:01:12,560
FOR EVERYBODY COMING TODAY.
THIS IS A BIG DEAL FOR US.

20
00:01:12,560 --> 00:01:16,109
AND I WAS TRYING TO THINK OF HOW
TO RELATE THIS TO SOMETHING THAT

21
00:01:16,109 --> 00:01:18,969
ALL OF YOU CAN WRAP YOUR MINDS
AROUND.

22
00:01:18,969 --> 00:01:22,249
BUT AS I LOOK OUT THERE, THE
UNFORTUNATE THING IS THAT MOST

23
00:01:22,249 --> 00:01:25,869
OF YOU ARE TOO YOUNG TO BE ABLE
TO RELATE.

24
00:01:25,869 --> 00:01:28,340
BUT HOW MANY OF YOU REMEMBER
ALT?

25
00:01:28,340 --> 00:01:33,109
DOES THAT RING A BELL?
ANYBODY KNOW WHAT ALT WAS?

26
00:01:33,109 --> 00:01:36,859
HOW ABOUT APPROACH AND LANDING
TEST?

27
00:01:36,859 --> 00:01:39,100
OKAY?
YOU REMEMBER OUT AT EDWARDS AIR

28
00:01:39,100 --> 00:01:42,469
FORCE BASE WHEN WE TOOK THE
SPACE SHUTTLE AND WE DROPPED IT

29
00:01:42,469 --> 00:01:48,079
OFF THE 747 BECAUSE WE WANTED TO
MAKE SURE IT COULD FLY?

30
00:01:48,079 --> 00:01:52,079
AND IT DID PRETTY WELL.
WELL, IF YOU WANT TO TRY TO

31
00:01:52,079 --> 00:01:55,779
RELATE WHAT'S ABOUT TO HAPPEN IN
DECEMBER TO SOMETHING THAT ALL

32
00:01:55,779 --> 00:02:00,259
OF YOU CAN RELATE TO, THIS IS
SORT OF LIKE THE FIRST OF

33
00:02:00,259 --> 00:02:05,950
HOWEVER MANY FLIGHTS OF ALT THAT
WE'RE GOING TO DO WITH ORION.

34
00:02:05,950 --> 00:02:09,500
RIGHT IN FRONT OF -- BEHIND ME
BUT IN FRONT OF YOU IS A

35
00:02:09,500 --> 00:02:11,830
TANGIBLE PIECE OF OUR PATH TO
MARS.

36
00:02:11,830 --> 00:02:14,860
AND ORION SPACECRAFT THAT'S
GOING TO TRAVEL FARTHER INTO

37
00:02:14,860 --> 00:02:18,590
SPACE THAN HUMANS HAVE GONE FOR
40 YEARS.

38
00:02:18,590 --> 00:02:21,489
OVER THE PAST FOUR YEARS, NASA'S
BEEN IMPLEMENTING THE NASA

39
00:02:21,489 --> 00:02:25,180
AUTHORIZATION ACT OF 2010 WHICH
WAS ENACTED ON A BROAD

40
00:02:25,180 --> 00:02:27,769
BIPARTISAN BASIS.
I KNOW YOU ALL FIND THAT HARD TO

41
00:02:27,769 --> 00:02:31,260
BELIEVE, BUT IT ACTUALLY WAS
ENACTED ON A BROAD BIPARTISAN

42
00:02:31,260 --> 00:02:34,489
BASIS AND REFLECTS AGREEMENTS
BETWEEN THE CONGRESS AND THE

43
00:02:34,489 --> 00:02:38,349
ADMINISTRATION ON THE NATION'S
NEXT STEPS IN SPACE.

44
00:02:38,349 --> 00:02:42,239
EXPLORATION FLIGHT TEST 1 OR
EFT-1 AS WE CALL IT IS A

45
00:02:42,239 --> 00:02:46,829
CRITICAL PART OF THAT STRATEGY.
AND A BIG STEP FORWARD ON THE

46
00:02:46,829 --> 00:02:50,760
PATH TO MARS.
THE TEST DEMONSTRATES HOW BOB

47
00:02:50,760 --> 00:02:54,030
CABANA AND THE KENNEDY SPACE
CENTER TEAM CONTINUE TO

48
00:02:54,030 --> 00:02:58,030
TRANSFORM THIS CENTER INTO A
MULTIUSER FACILITY CAPABLE OF

49
00:02:58,030 --> 00:03:00,670
MANY DIFFERENT KINDS OF
LAUNCHES.

50
00:03:00,670 --> 00:03:04,530
AND IT'S POSSIBLY THE MOST
SIGNIFICANT HUMAN SPACE FLIGHT

51
00:03:04,530 --> 00:03:08,379
MILESTONE THIS YEAR, POINTING
TOWARD A RETURN WITH HUMANS TO

52
00:03:08,379 --> 00:03:11,530
DEEP SPACE.
SUSTAINED INVESTMENT IN NASA

53
00:03:11,530 --> 00:03:15,579
TECHNOLOGY ADVANCES THE AGENCY'S
EXPLORATION CAPABILITIES AND

54
00:03:15,579 --> 00:03:21,109
SUPPORTS THE INNOVATION ECONOMY.
WE NEED TO KEEP DOING THAT IN

55
00:03:21,109 --> 00:03:24,469
ORDER TO REACH AN ASTEROID AND
MARS AND OTHER DESTINATIONS IN

56
00:03:24,469 --> 00:03:27,879
THE FUTURE.
AS MARK GEYER CAN TELL YOU ABOUT

57
00:03:27,879 --> 00:03:31,739
IN GREAT DETAIL, ORION'S FLIGHT
TEST WILL STRESS SYSTEMS

58
00:03:31,739 --> 00:03:35,379
CRITICAL TO SAFETY INCLUDING THE
HEAT SHIELD, PARACHUTES,

59
00:03:35,379 --> 00:03:39,870
AVIONICS AND ATTITUDE CONTROL.
WHEN WAS THE LAST TIME YOU SAW A

60
00:03:39,870 --> 00:03:42,769
VEHICLE THAT COULD REACH A
SPEED -- THIS IS A QUESTION,

61

00:03:42,769 --> 00:03:45,920

OKAY?

THIS IS NOT RHETORICAL.

62

00:03:45,920 --> 00:03:49,510

WHEN WAS THE LAST TIME THAT YOU
SAW A VEHICLE THAT COULD REACH A

63

00:03:49,510 --> 00:03:54,230

SPEED OF 20,000 MILES PER HOUR
AND A TEMPERATURE OF 4,000

64

00:03:54,230 --> 00:03:59,150

DEGREES FAHRENHEIT?
WHEN?

65

00:03:59,150 --> 00:04:02,109

1975.

THAT'S ABSOLUTELY RIGHT.

66

00:04:02,109 --> 00:04:05,319

"APOLLO SOYUZ."

THIS TEST IS GOING TO SHOW US A

67

00:04:05,319 --> 00:04:08,540

LOT BEFORE ORION CARRIES HUMANS
ON MISSIONS TO EXPLORE AN

68

00:04:08,540 --> 00:04:13,469

ASTEROID AND EVENTUALLY MARS.
IT GIVES US THE CHANCE TO SEE

69

00:04:13,469 --> 00:04:16,519

HOW THIS VEHICLE WILL PERFORM IN
THE ORBITAL ENVIRONMENT AS IT

70

00:04:16,519 --> 00:04:19,950

FACES SOME OF THE CHALLENGES
THAT WILL ENDURE ON FUTURE

71
00:04:19,950 --> 00:04:23,850
MISSIONS TO SPACE.
THAT'S INCREDIBLY EXCITING FOR

72
00:04:23,850 --> 00:04:27,360
ME, AND I COULDN'T BE HAPPIER TO
SEE THE FULL SYSTEM INTEGRATION

73
00:04:27,360 --> 00:04:31,630
OF ORION PROCEEDING SO WELL.
WHILE ORION HARDWARE HAS BEEN

74
00:04:31,630 --> 00:04:34,530
TESTED EXTENSIVELY ON THE
GROUND, PUTTING THE SPACECRAFT

75
00:04:34,530 --> 00:04:38,390
THROUGH ITS PACES IN SPACE
PROVIDES DATA YOU JUST CAN'T GET

76
00:04:38,390 --> 00:04:41,110
HERE ON EARTH.
RIGHT NOW NASA'S BUILDING ON

77
00:04:41,110 --> 00:04:44,000
KNOWLEDGE GAINED THROUGH THE
INTERNATIONAL SPACE STATION AND

78
00:04:44,000 --> 00:04:47,450
MORE THAN 50 YEARS OF HUMAN
SPACE FLIGHT EXPERIENCE.

79
00:04:47,450 --> 00:04:50,110
SOLVING DIFFICULT CHALLENGES
THAT WILL ENABLE HUMANS TO

80
00:04:50,110 --> 00:04:53,920
SAFELY EXPLORE DEEP SPACE.
WHAT YOU SEE HERE TODAY IS A

81
00:04:53,920 --> 00:04:56,570
CRITICAL PART OF THAT STRATEGIC
WORK.

82
00:04:56,570 --> 00:04:59,890
IT'S NOT OFTEN YOU GET THIS
CLOSE TO SOMETHING THAT'S BOUND

83
00:04:59,890 --> 00:05:02,330
FOR SPACE.
AND WE LOOK FORWARD TO TELLING

84
00:05:02,330 --> 00:05:05,140
YOU MORE ABOUT ORION AND OUR
PATH TO MARS.

85
00:05:05,140 --> 00:05:09,250
AND SINCE I'M NOT THE DETAIL GUY
AND I PROBABLY COULDN'T ANSWER

86
00:05:09,250 --> 00:05:14,090
THE DETAILS IF YOU TRIED ME, I
HAVE MY TRUSTY FRIEND BEHIND ME,

87
00:05:14,090 --> 00:05:17,410
AND I'M GOING TO ASK MARK GEYER,
THE ORION PROGRAM MANAGER, TO

88
00:05:17,410 --> 00:05:23,820
STEP UP AND MAKE A COUPLE MORE
REMARKS BEFORE WE TAKE YOUR

89
00:05:23,820 --> 00:05:28,260
QUESTIONS.
SO MARK?

90
00:05:28,260 --> 00:05:29,380
>> THANK YOU, CHARLIE.
THANK YOU, CHARLIE AND THANKS,

91
00:05:29,380 --> 00:05:31,750
EVERYBODY, FOR COMING TODAY.
IT'S A BIG DAY FOR US TO

92
00:05:31,750 --> 00:05:33,810
ACTUALLY STACK THESE TWO
ELEMENTS TOGETHER.

93
00:05:33,810 --> 00:05:36,470
WE'LL FINISH NOW THAT THE
INTEGRATED TESTING BETWEEN THE

94
00:05:36,470 --> 00:05:39,240
TWO AND THEN WE'LL SEND IT OFF
TO GET FUELED AND THEN STACKED

95
00:05:39,240 --> 00:05:41,150
ON THE ROCKET.
AS CHARLIE SAID, WE'RE GOING TO

96
00:05:41,150 --> 00:05:45,710
LAUNCH IN LESS THAN SIX MONTHS.
SO THIS SPACECRAFT, OF COURSE,

97
00:05:45,710 --> 00:05:50,190
IS THE FIRST HUMAN EXPLORATION
SPACECRAFT DEVELOPED IN NOW OVER

98
00:05:50,190 --> 00:05:52,020
30 YEARS.
IT'S A BIG DEAL AND IT'S THE

99
00:05:52,020 --> 00:05:56,460
PRODUCT OF VERY DEDICATED WORK
FORCE THAT BELIEVES THAT KEEPING

100
00:05:56,460 --> 00:06:00,740
AMERICA FIRST IN SPACE
EXPLORATION IS CRITICAL.

101

00:06:00,740 --> 00:06:04,520

THE LAUNCH ITSELF COMING UP IN
SIX MONTHS IS GOING TO BE

102

00:06:04,520 --> 00:06:07,270

VISIBLE EVIDENCE THAT WE ARE
STILL EXPLORING.

103

00:06:07,270 --> 00:06:11,090

BUT THERE'S OTHER VISIBLE PIECES
THAT YOU CAN SEE TODAY THAT SHOW

104

00:06:11,090 --> 00:06:14,210

US HOW WE'RE FEEDING FORWARD TO
THE NEXT LAUNCHES.

105

00:06:14,210 --> 00:06:18,190

WHEN YOU COME HERE AND SEE THE
SAME EVENT FOR EM-1 AND EM-2,

106

00:06:18,190 --> 00:06:20,770

YOU WOULD NOTICE IT'S GOING TO
LOOK REMARKABLY SIMILAR.

107

00:06:20,770 --> 00:06:24,560

I DON'T MEAN THE OUTER LINE BUT
ACTUALLY THE GUTS OF THE

108

00:06:24,560 --> 00:06:28,640

SPACECRAFT BECAUSE ALL OF THESE
SYSTEMS FLYING ON EFT-1 WERE

109

00:06:28,640 --> 00:06:34,140

DESIGNED TO BE ABLE TO FLY
PEOPLE ON BOARD.

110

00:06:34,140 --> 00:06:37,310

AND NOW WE'RE ACTUALLY NOT JUST
DRAWINGS AND POWERPOINT, BUT WE

111

00:06:37,310 --> 00:06:41,750

ACTUALLY PUT IT INTO HARDWARE,
ASSEMBLE IT AND NOW FLY IT.

112

00:06:41,750 --> 00:06:45,190

WE WILL MAKE SOME UPDATES.
IN SOME CASES WE FOUND THINGS WE

113

00:06:45,190 --> 00:06:47,190

CAN MAKE LIGHTER, FOR EXAMPLE,
THE HEAT SHIELD.

114

00:06:47,190 --> 00:06:50,470

SO IT WAS A HUGE EXPERIENCE FOR
US TO BUILD THE FIRST ONE.

115

00:06:50,470 --> 00:06:53,720

IN SOME CASES WE FOUND WAYS TO
MAKE IT CHEAPER ON THE NEXT ONE.

116

00:06:53,720 --> 00:06:56,590

FOR EXAMPLE, IF YOU THINK ABOUT
THE CONE THERE AT THE TOP, THE

117

00:06:56,590 --> 00:06:59,970

GREEN PART, WE FOUND A WAY TO
MAKE THAT IN FEWER PARTS.

118

00:06:59,970 --> 00:07:02,840

SO YES, THIS ONE COULD FLY
PEOPLE, BUT NOW WE'RE GOING TO

119

00:07:02,840 --> 00:07:05,560

UPDATE IT AND SAVE MONEY ON THE
NEXT UNIT.

120

00:07:05,560 --> 00:07:09,020

THINGS LIKE THE COMPUTER SYSTEM
THAT'S ON THIS BIRD WILL BE

121

00:07:09,020 --> 00:07:11,720

EXACTLY THE SAME ON THE NEXT
FLIGHTS EXCEPT WE'LL ADD ANOTHER

122

00:07:11,720 --> 00:07:15,050

STRING OF REDUNDANCY BECAUSE ON
A TEST FLIGHT WE DON'T NEED IT.

123

00:07:15,050 --> 00:07:18,500

BUT WHEN WE FLY PEOPLE, WE'LL
HAVE THREE STRINGS.

124

00:07:18,500 --> 00:07:21,280

ANOTHER THING TO THINK ABOUT IS
THE SOFTWARE WHICH IS ALWAYS A

125

00:07:21,280 --> 00:07:23,370

CHALLENGE.
IF YOU THINK ABOUT THE FULL

126

00:07:23,370 --> 00:07:26,620

SOFTWARE FOR FLYING PEOPLE ON
THE MANNED FLIGHT, WE'VE WRITTEN

127

00:07:26,620 --> 00:07:29,930

NOW HALF OF THAT ALREADY.
HALF OF THE SOFTWARE IS DONE.

128

00:07:29,930 --> 00:07:34,000

TESTED AND WILL FLY ON EFT-1.
SO WE HAVE MORE WORK TO GO TO

129

00:07:34,000 --> 00:07:36,750

GET TO EM-1 AND EM-2, BUT THIS
FLIGHT, NOT JUST THE LAUNCH IN

130

00:07:36,750 --> 00:07:40,930

DECEMBER, BUT THE WORK THAT WENT
INTO THIS DESIGN SETS US UP VERY

131

00:07:40,930 --> 00:07:44,360

WELL FOR THE NEXT FLIGHTS AND
FOR EVENTUALLY GETTING PEOPLE

132

00:07:44,360 --> 00:07:48,360

INTO SPACE.
SO NOW WHAT I WANT TO DO IS

133

00:07:48,360 --> 00:07:51,610

INTRODUCE CLEON LACEFIELD.
CLEON IS THE LOCKHEED PROGRAM

134

00:07:51,610 --> 00:07:54,800

MANAGER FOR ORION AND A BIG PART
OF WHY WE ARE HERE TODAY, AND

135

00:07:54,800 --> 00:07:57,930

HE'S GOING TO DESCRIBE MORE
ABOUT THE MISSION ITSELF.

136

00:07:57,930 --> 00:08:02,990

THANK YOU.
>> YEAH, IT'S GREAT TO BE HERE

137

00:08:02,990 --> 00:08:06,620

TODAY WITH OUR VEHICLE GETTING
SO CLOSE TO LAUNCH.

138

00:08:06,620 --> 00:08:10,550

AND WHAT I THOUGHT I WOULD DO
TODAY IS TALK A LITTLE BIT ABOUT

139

00:08:10,550 --> 00:08:14,640

THE FLIGHT TESTS THAT WE'RE
GOING TO DO WITH THE ORION

140

00:08:14,640 --> 00:08:16,240

VEHICLE.
WE'RE CALLING IT EXPLORATION

141

00:08:16,240 --> 00:08:21,140

FLIGHT TEST 1, AND THIS IS THE
FIRST HIGH-ORBITAL FLIGHT TEST

142

00:08:21,140 --> 00:08:26,310

OF THE ORION SPACECRAFT.
THIS FLIGHT TEST IS SCHEDULED ON

143

00:08:26,310 --> 00:08:29,960

DECEMBER 4th OF THIS YEAR.
AND SO THE COUNTDOWN CLOCK THAT

144

00:08:29,960 --> 00:08:33,990

WE'RE SEEING OVER HERE IS THE
NUMBER OF DAYS TO THE DECEMBER

145

00:08:33,990 --> 00:08:37,710

4th LAUNCH.
DURING THAT FLIGHT, ORION WILL

146

00:08:37,710 --> 00:08:41,520

TRAVEL 15 TIMES FURTHER OUT INTO
SPACE THAN THE SPACE STATION IS

147

00:08:41,520 --> 00:08:44,860

CURRENTLY TODAY.
AND IT'S FURTHER THAN HUMANS

148

00:08:44,860 --> 00:08:51,610

HAVE GONE, LIKE CHARLIE SAID, IN
THE LAST 40 YEARS.

149

00:08:51,610 --> 00:08:57,620

SO WE TALKED ABOUT A LITTLE
BIT -- CHARLIE TALKED ABOUT WHAT

150

00:08:57,620 --> 00:09:01,820

WE'RE GETTING OUT OF THE FLIGHT
WITH THE CHECKOUT OF ALL THE

151

00:09:01,820 --> 00:09:04,510

SYSTEMS, THE COMPUTERS, THE
SOFTWARE, THE GUIDANCE AND

152

00:09:04,510 --> 00:09:08,700

CONTROL, THE SEPARATION EVENTS,
THE HEAT SHIELD.

153

00:09:08,700 --> 00:09:13,380

AND AS MARK SAID, THIS IS THE
SPACECRAFT THAT WE WILL BE

154

00:09:13,380 --> 00:09:17,620

BUILDING FOR THE EXPLORATION
MISSIONS 1 AND 2 THAT ARE COMING

155

00:09:17,620 --> 00:09:23,150

UP LATER IN THIS DECADE.
THIS FLIGHT WILL BE AN UNCREWED

156

00:09:23,150 --> 00:09:27,990

LAUNCH ON A DELTA IV HEAVY.
IT WILL LAUNCH FROM PAD 37 AT

157

00:09:27,990 --> 00:09:33,230

CAPE CANAVERAL AIR FORCE BASE.
AND IT WILL TRAVEL 3,600 MILES

158

00:09:33,230 --> 00:09:38,260

BEYOND LOW-EARTH ORBIT AND
RE-ENTER AT APPROXIMATELY 20,000

159

00:09:38,260 --> 00:09:41,250

MILES PER HOUR.
IT WILL SPLASH DOWN IN THE

160

00:09:41,250 --> 00:09:45,330

PACIFIC OCEAN WHERE THE U.S.
NAVY AND NASA GROUND PERSONNEL

161

00:09:45,330 --> 00:09:48,710

WILL RECOVER THE SPACECRAFT.
THE ENTIRE FLIGHT WILL TAKE

162

00:09:48,710 --> 00:09:54,530

ABOUT FOUR HOURS AND 25 MINUTES.
AS FAR AS THE TIME LINE GOES,

163

00:09:54,530 --> 00:09:57,930

THE LAUNCH WILL OCCUR AT
APPROXIMATELY SUNRISE ON

164

00:09:57,930 --> 00:10:02,110

DECEMBER 4th, WHICH IS RIGHT
AROUND 8:00 A.M.

165

00:10:02,110 --> 00:10:07,840

5:30 LATER, THE SERVICE MODULE
BEARINGS WILL JETTISON, THOSE

166

00:10:07,840 --> 00:10:13,520

BIG WHITE BEARINGS BEHIND US.
OVER SIX MINUTES INTO THE

167

00:10:13,520 --> 00:10:15,850

FLIGHT, THE LAUNCH ABOARD SYSTEM
IS JETTISONED.

168

00:10:15,850 --> 00:10:20,810

AT ABOUT THE TWO-HOUR MARK, THE
UPPER-STAGE SECOND STAGE ENGINE

169

00:10:20,810 --> 00:10:26,990

BURNS AND RAISES ORION IN THE
ORBIT TO CREATE THE HIGH REENTRY

170

00:10:26,990 --> 00:10:30,960

VELOCITY.
AT 3:45, THE CREW MODULE WILL

171

00:10:30,960 --> 00:10:34,360

SEPARATE FROM THE SERVICE MODULE
AND THE UPPER STAGE.

172

00:10:34,360 --> 00:10:38,940

AT 4:15, THE CREW MODULE BEGINS
TO ENCOUNTER EARTH'S ATMOSPHERE.

173

00:10:38,940 --> 00:10:44,740

AND AT 4:20, IT ALLOWS THE
SHEETS TO DEPLOY WHICH HAPPENS

174

00:10:44,740 --> 00:10:49,310

ABOUT TWO SECONDS LATER.
AT ABOUT 4:25, THE VEHICLE

175

00:10:49,310 --> 00:10:53,380

SPLASHES DOWN INTO THE PACIFIC
OCEAN.

176

00:10:53,380 --> 00:10:57,430

AND IT IS RECOVERED BY THE NAVY
AND NASA GROUND OPERATIONS

177

00:10:57,430 --> 00:11:00,950

PERSONNEL.
THE VEHICLE WILL BE TRANSPORTED

178

00:11:00,950 --> 00:11:06,040

BACK HERE, AND WE WILL ACTUALLY
REUSE THIS VEHICLE FOR AN ASCENT

179

00:11:06,040 --> 00:11:10,279

ABOARD FLIGHT TEST PRIOR TO
EM-2.

180

00:11:10,279 --> 00:11:16,340

AND WITH THAT, I'D LIKE TO TURN
OVER THE DISCUSSION TO THE

181

00:11:16,340 --> 00:11:23,070

CENTER DIRECTOR, MR. BOB CABANA.

>> THANKS, CLEON.

182

00:11:23,070 --> 00:11:27,600

WELL, FOR THE FIRST TIME SINCE

WE WENT TO THE MOON, WE'RE

183

00:11:27,600 --> 00:11:32,100

STACKING A VEHICLE IN THIS HIGH

BAY THAT WILL ALLOW US TO

184

00:11:32,100 --> 00:11:35,680

EXPLORE BEYOND OUR PLANET AND

ONE DAY PUT BOOTS ON MARS AND

185

00:11:35,680 --> 00:11:38,950

THAT'S PRETTY DARN EXCITING.

THIS IS A WORLD-CLASS

186

00:11:38,950 --> 00:11:43,600

MANUFACTURING FACILITY WITH A

WORLD-CLASS TEAM OPERATING IT.

187

00:11:43,600 --> 00:11:46,540

AND I WANT TO THANK THE STATE OF

FLORIDA FOR HELPING TO MAKE IT

188

00:11:46,540 --> 00:11:48,870

POSSIBLE.

AND I COMMEND THE LOCKHEED

189

00:11:48,870 --> 00:11:52,220

MARTIN TEAM ON THE OUTSTANDING

JOB THAT THEY'VE DONE

190

00:11:52,220 --> 00:11:56,600

MANUFACTURING AND PROCESSING

ORION FOR ITS FLIGHT TEST THIS

191

00:11:56,600 --> 00:11:59,589

DECEMBER.

WE ARE WELL ON OUR WAY TO

192

00:11:59,589 --> 00:12:03,230

ESTABLISHING A HUMAN PRESENCE IN
OUR SOLAR SYSTEM.

193

00:12:03,230 --> 00:12:06,060

AND WHEN WE LEAVE PLANET EARTH
TO DO IT, WE'RE GOING TO BE

194

00:12:06,060 --> 00:12:08,550

LEAVING FROM RIGHT HERE AT THE
KENNEDY SPACE CENTER.

195

00:12:08,550 --> 00:12:12,320

I COULDN'T BE MORE PROUD OF THIS
TEAM IN WHAT WE'RE DOING AND THE

196

00:12:12,320 --> 00:12:15,650

PATH THAT WE HAVE GOING FORWARD.
SO TO EVERYONE, THANKS FOR YOUR

197

00:12:15,650 --> 00:12:20,190

OUTSTANDING SUPPORT, AND GO
ORION.

198

00:12:20,190 --> 00:12:24,360

>> OKAY.

WE'RE GOING TO TAKE QUESTIONS

199

00:12:24,360 --> 00:12:27,710

FROM THOSE HERE.

AND AS A REMINDER FOR THOSE WHO

200

00:12:27,710 --> 00:12:30,640

ARE GOING TO BE UP AT THE MIKE,
PLEASE BE SURE TO STATE YOUR

201

00:12:30,640 --> 00:12:34,300

NAME AND AFFILIATION AND DIRECT
YOUR QUESTION TO A PARTICULAR

202

00:12:34,300 --> 00:12:37,860

PERSON, IF YOU CAN.
AND THEN FOR THOSE WATCHING FROM

203

00:12:37,860 --> 00:12:42,710

AFAR, AS A REMINDER, YOU CAN ASK
YOUR QUESTION ON SOCIAL MEDIA

204

00:12:42,710 --> 00:12:47,500

USING THE #ASKNASA.
FIRST QUESTION.

205

00:12:47,500 --> 00:12:48,740

GO AHEAD, IRENE.
>> THANKS.

206

00:12:48,740 --> 00:12:55,740

IRENE KLOTZ WITH REUTERS AND SPACE NEWS. WHEN IS THAT ASCENT ABORT TEST

207

00:12:55,970 --> 00:13:02,740

SCHEDULED FOR?
>> THE ASCENT ABORT IS SCHEDULED

208

00:13:02,740 --> 00:13:08,250

IN 2018.
AND IT HAS TO HAPPEN BEFORE EM-2

209

00:13:08,250 --> 00:13:11,560

BECAUSE IT'S PART OF THE
CERTIFICATION BEFORE WE HAVE THE

210

00:13:11,560 --> 00:13:13,980

ASTRONAUTS ON BOARD THE VEHICLE.
>> THANKS.

211

00:13:13,980 --> 00:13:17,350
AND HOW MANY CAPSULES IS
LOCKHEED MARTIN CURRENTLY UNDER

212
00:13:17,350 --> 00:13:21,350
CONTRACT TO BUILD?
>> WE WILL BE BUILDING THIS ONE

213
00:13:21,350 --> 00:13:26,300
AND TWO OTHERS.
>> THANKS.

214
00:13:26,300 --> 00:13:32,510
>> ALL RIGHT, DAN BILLO FROM
WESH-TV.

215
00:13:32,510 --> 00:13:39,510
A QUESTION FOR GENERAL BOLDEN.
WHAT YEAR WILL THE FIRST

216
00:13:40,670 --> 00:13:44,420
ASTRONAUT CLIMB ABOARD ONE OF
THESE SHIPS AS FAR AS YOU KNOW?

217
00:13:44,420 --> 00:13:49,300
AND IS IT A LITTLE HARD TO
SUSTAIN MOMENTUM FOR A GRAND

218
00:13:49,300 --> 00:13:53,930
MISSION TO ASTEROIDS AND MARS
WHEN YOU'RE NOT FLYING PEOPLE

219
00:13:53,930 --> 00:13:56,190
VERY OFTEN?
>> WE HAD CONVERSATION ABOUT

220
00:13:56,190 --> 00:13:58,560
THAT THIS MORNING WITH SOME OF
THE YOUNG LEADERS HERE AS WELL

221

00:13:58,560 --> 00:14:02,580
AS THE SENIOR LEADERSHIP.
IT'S NOT HARD TO MAINTAIN

222
00:14:02,580 --> 00:14:06,630
MOMENTUM AMONG THE WORK FORCE.
THE MOMENTUM THAT'S DIFFICULT IS

223
00:14:06,630 --> 00:14:10,120
AMONG MANY OF YOU.
YOU KNOW, THE GENERAL PUBLIC,

224
00:14:10,120 --> 00:14:13,020
PEOPLE WHO AREN'T AROUND US
EVERY SINGLE DAY.

225
00:14:13,020 --> 00:14:16,830
IN TERMS OF THE SPECIFIC YEAR
THAT WE'LL ACTUALLY FLY, I

226
00:14:16,830 --> 00:14:22,640
ASSUME THAT'S WHAT YOU MEAN, A
HUMAN LAUNCH, IS IN THE 2019,

227
00:14:22,640 --> 00:14:25,950
2020 TIME FRAME, IF I REMEMBER
CORRECTLY.

228
00:14:25,950 --> 00:14:29,680
2021.
BUT WE HAVE ALREADY HAD HUMANS

229
00:14:29,680 --> 00:14:33,940
IN THE SPACECRAFT.
AND WE'VE GOT DOUG HURLEY AND

230
00:14:33,940 --> 00:14:36,800
REX WALTHEIM WHO ARE BACK HERE
IN THE BLUE SUITS.

231

00:14:36,800 --> 00:14:39,200
AND THEY'RE HERE TO ANSWER ALL
THE HARD QUESTIONS.

232
00:14:39,200 --> 00:14:42,180
BUT THEY CAN -- YOU KNOW, I
WOULD RECOMMEND THAT WHEN YOU

233
00:14:42,180 --> 00:14:45,630
HAVE AN OPPORTUNITY TO TALK TO
THEM, ASK THEM ABOUT WHAT KIND

234
00:14:45,630 --> 00:14:48,020
OF TRAINING OR WHAT KIND OF
PREPARATION'S GOING ON IN THE

235
00:14:48,020 --> 00:14:50,149
ASTRONAUT OFFICE, HOW DO THEY
GET PREPARED.

236
00:14:50,149 --> 00:14:52,920
SO THEY'RE PROBABLY GOING TO BE
THE ONES THAT TELL US WHEN

237
00:14:52,920 --> 00:14:55,970
THEY'RE READY TO START GETTING
FULLY INTEGRATED INTO THE SYSTEM

238
00:14:55,970 --> 00:14:59,100
ITSELF.
BUT THE 2020, 2021 TIME FRAME IS

239
00:14:59,100 --> 00:15:03,060
WHEN WE HOPE TO FLY THE FIRST
HUMAN-RATED MISSION.

240
00:15:03,060 --> 00:15:06,560
OKAY.
>> THANK YOU.

241

00:15:06,560 --> 00:15:12,440
>> HI, KALA RAMA WITH WKMG.
CAN YOU TALK ABOUT THE CAMERAS

242
00:15:12,440 --> 00:15:16,589
ATTACHED SO WE CAN TALK ABOUT
THE VIEWS THAT YOU'LL GET IN

243
00:15:16,589 --> 00:15:18,800
ORBIT?
>> YES, YOU CAN.

244
00:15:18,800 --> 00:15:21,670
SO WE THOUGHT ABOUT THAT QUITE A
BIT.

245
00:15:21,670 --> 00:15:24,040
SOME OF IT IS SO THAT WE CAN
ENSURE THAT WITH THE PUBLIC A

246
00:15:24,040 --> 00:15:27,200
LOT OF IT IS FOR ENGINEERING
DATA SO WE CAN SEE THINGS.

247
00:15:27,200 --> 00:15:29,550
WE'LL HAVE CAMERAS THAT WATCH
THE SEPARATION EVENTS, THE

248
00:15:29,550 --> 00:15:33,060
FARINGS, THESE BIG FARINGS ON
THE SIDE.

249
00:15:33,060 --> 00:15:37,770
WE HAVE CAMERAS THAT WILL WATCH
THE LAUNCH ABORT SYSTEM, OGIVE SEPARATE. CAMERAS THAT

250
00:15:37,770 --> 00:15:41,190
WATCH THE PARACHUTES UNFURL.
WE HAVE CAMERAS OUT THE WINDOWS

251

00:15:41,190 --> 00:15:43,880
SO WE'LL SEE SOME OF THOSE
EVENTS AND SOME DURING ENTRY.

252
00:15:43,880 --> 00:15:48,420
SO WE'RE GOING TO HAVE A LOT OF
GOOD VIEWS OF THIS FLIGHT.

253
00:15:52,320 --> 00:15:55,200
>> HI, STEVEN CLARK WITH SPACE
FLIGHT NOW.

254
00:15:55,200 --> 00:16:01,920
FIRST FOR MR. GEYER AND MR. LACEFIELD. CAN YOU TELL US WHAT IT'S GOING TO LOOK LIKE INS

255
00:16:01,920 --> 00:16:05,700
FLIES ON EFT-1? I HAVE ANOTHER FOLLOW-UP AS WELL.

256
00:16:05,900 --> 00:16:09,240
>> SO INSIDE IT WILL LOOK -- THE

257
00:16:09,250 --> 00:16:11,740
AVIONICS BAY WHICH IS WHERE ALL
THE COMPUTERS AND ALL THE

258
00:16:11,740 --> 00:16:15,130
COOLING SYSTEM WILL LOOK EXACTLY
LIKE IT WILL LOOK ON THE MANNED

259
00:16:15,130 --> 00:16:17,220
FLIGHT WHEN WE ACTUALLY PUT
PEOPLE INSIDE.

260
00:16:17,220 --> 00:16:22,089
BUT IT'S BASICALLY ONCE YOU COME
IN THE HATCH, THERE'S A PLATFORM

261
00:16:22,089 --> 00:16:24,010
THAT YOU WOULD STEP ON TO.
BELOW THAT IS WHERE THE

262

00:16:24,010 --> 00:16:27,899

COMPUTERS ARE ATTACHED AND THEN
CONNECTED ON THE INSIDE.

263

00:16:27,899 --> 00:16:30,350

EVENTUALLY WHEN WE FLY PEOPLE,
THOUGH, THERE WILL OBVIOUSLY BE

264

00:16:30,350 --> 00:16:34,120

THE SEATS, THE OTHER STOWAGE
AREAS AND THEN THE DISPLAYS AND

265

00:16:34,120 --> 00:16:37,550

CONTROLS.

ON THIS FLIGHT, WE DO FLY WHAT

266

00:16:37,550 --> 00:16:41,380

WE CALL MASS SIMULATORS.

WE HAVE THAT FOR DISPLAY AND

267

00:16:41,380 --> 00:16:42,830

CONTROL PANEL.

YOU LOOK IN THERE, THAT WILL BE

268

00:16:42,830 --> 00:16:48,410

THIS METAL THING BECAUSE WE N EED
TO UNDERSTAND IN THE

269

00:16:48,410 --> 00:16:52,240

ENVIRONMENTS WE SEE HOW THAT
MASS REACTS WITH THE STRUCTURES.

270

00:16:52,240 --> 00:16:54,200

SO WHEN WE FLY THE REAL ONE, WE
KNOW -- BUT OBVIOUSLY IT DOESN'T

271

00:16:54,200 --> 00:16:56,230

NEED ALL THE SWITCHES AND ALL
THE OTHER STUFF THAT'S A PART OF

272

00:16:56,230 --> 00:16:59,000

THAT.

>> FOR ADMINISTRATOR BOLDEN.

273

00:16:59,000 --> 00:17:04,110

I WANTED TO GET YOUR THOUGHTS ON
WHETHER YOU THINK IT'S TIME FOR

274

00:17:04,110 --> 00:17:07,449

AMERICA TO INVEST IN A NEW
ROCKET ENGINE TO REPLACE THE RD-180?

275

00:17:07,449 --> 00:17:08,839

>> I THINK IT'S PREMATURE TO

276

00:17:08,839 --> 00:17:11,369

THINK ABOUT INVESTING IN A NEW
ROCKET ENGINE.

277

00:17:11,369 --> 00:17:14,739

WE'VE ALSO BEEN DISCUSSING THIS
QUITE A BIT.

278

00:17:14,739 --> 00:17:17,839

WHAT WE ENCOURAGE PEOPLE TO DO
IS THINK ABOUT WHAT IT IS YOU

279

00:17:17,839 --> 00:17:21,429

WANT TO DO.

AND OUR FOCUS IS ON ACCESS TO

280

00:17:21,429 --> 00:17:24,789

SPACE.

HOW DO WE PROVIDE ROUTINE,

281

00:17:24,789 --> 00:17:28,029

RELIABLE ACCESS TO SPACE.

AND SO IF YOU GET FOCUSED ON A

282

00:17:28,029 --> 00:17:31,929

SPECIFIC ENGINE, YOU MAY ASK
YOURSELF THEN, OKAY, WHAT

283

00:17:31,929 --> 00:17:33,529

VEHICLE ARE WE GOING TO PUT IT
ON?

284

00:17:33,529 --> 00:17:37,230

EVERYTHING ELSE.
SO NASA'S APPROACH IS LET'S

285

00:17:37,230 --> 00:17:41,190

FOCUS ON ACCESS TO SPACE.
WE'VE DECIDED THAT FOR LOW-EARTH

286

00:17:41,190 --> 00:17:45,429

ORBIT AND TO MAKE A SUSTAINABLE
LOW-EARTH ORBIT INFRASTRUCTURE

287

00:17:45,429 --> 00:17:50,210

THAT WE'RE GOING TO NEED FOR THE
FUTURE FLIGHTS OF ORION ON SLS

288

00:17:50,210 --> 00:17:53,999

TO GO TO DEEP SPACE, THAT'S WHY
WE WORK WITH OUR INDUSTRY

289

00:17:53,999 --> 00:17:57,580

PARTNERS TO DEVELOP COMMERCIAL
CREW AND CARGO CAPABILITY.

290

00:17:57,580 --> 00:18:00,110

BECAUSE THEY'RE THE ONES THAT
PROVIDE THE ROUTINE ACCESS TO

291

00:18:00,110 --> 00:18:05,019

LOW-EARTH ORBIT SO WE HAVE A
PLACE WE CAN GO AND COME FROM.

292

00:18:05,019 --> 00:18:08,749

OUR JOB IS TO PROVIDE THE
VEHICLE THAT CAN GET US ACCESS

293

00:18:08,749 --> 00:18:12,259

TO DEEP SPACE.
AND THAT'S WHY OUR FOCUS ON SLS

294

00:18:12,259 --> 00:18:16,259

AND ORION RIGHT NOW.
WITH OUR INTERNATIONAL PARTNERS,

295

00:18:16,259 --> 00:18:19,220

WE CONTINUE TO WORK WITH THEM.
I THINK MOST OF YOU KNOW THAT

296

00:18:19,220 --> 00:18:23,070

THE SERVICE MODULE FOR ORION IS
GOING TO BE PREPARED BY THE

297

00:18:23,070 --> 00:18:27,179

EUROPEAN SPACE AGENCY.
YOU KNOW, LOCKHEED MARTIN, AS

298

00:18:27,179 --> 00:18:30,590

THE PRIME CONTRACTOR FOR ORION,
IS WORKING WITH THEM ALREADY.

299

00:18:30,590 --> 00:18:33,409

SO WE'RE LOOKING AT ALL OF THOSE
KINDS OF THINGS.

300

00:18:33,409 --> 00:18:37,799

BUT WE'RE FOCUSED ON ACCESS AND
NOT SPECIFIC -- SPECIFIC

301

00:18:37,820 --> 00:18:41,509

VEHICLES, IF YOU WILL, OR ENGINES
TO GET US THERE.

302

00:18:41,509 --> 00:18:45,709

THAT'S NOT OUR FOCUS RIGHT NOW.

303

00:18:47,659 --> 00:18:47,660

>> JAMES DEAN, FLORIDA TODAY.

304

00:18:47,660 --> 00:18:51,419

I THINK THIS QUESTION IS FOR
MARK OR FOR WHOMEVER.

305

00:18:55,239 --> 00:18:57,909

VEHICLE READY TO GO.

I'M JUST WONDERING IF YOU CAN

306

00:18:57,909 --> 00:19:00,799

DISCUSS WHY IS IT GOING TO TAKE
SO LONG TO GET TO THAT FIRST

307

00:19:00,799 --> 00:19:03,919

FLIGHT?

IS IT MORE A FUNCTION OF WAITING

308

00:19:03,919 --> 00:19:07,509

FOR SLS?

WHY DOES IT TAKE SEVEN MORE

309

00:19:07,509 --> 00:19:12,129

YEARS MINIMUM TO GET FROM THIS
STAGE TO YOUR CREW-READY

310

00:19:12,129 --> 00:19:12,940

VEHICLE?

>> YEAH, GOOD QUESTION.

311

00:19:12,940 --> 00:19:15,210

BECAUSE WE HAVE A LOT ON THIS
VEHICLE.

312

00:19:15,210 --> 00:19:18,210

SO IN THIS VEHICLE WE DO, AS I MENTIONED, THE PARACHUTES, THE

313

00:19:18,210 --> 00:19:22,080
STRUCTURE, THE HEAT SHIELD.
THOSE ARE BIG-RISK ITEMS.

314

00:19:22,080 --> 00:19:24,399
WE STILL HAVE A LOT OF WORK IN
THE SERVICE MODULE AREA, SOME OF

315

00:19:24,399 --> 00:19:26,489
WHICH ISA IS GOING TO DO WHICH
TAKES TIME.

316

00:19:26,489 --> 00:19:33,210
THEY JUST FINISHED THEIR PDR.
WE ALSO THEN HAVE TO WORK ON THE

317

00:19:33,210 --> 00:19:34,749
LIFE SUPPORT SYSTEM, THE CREW

318

00:19:34,749 --> 00:19:37,419
DISPLAYS, CREW SEATS, ALL OF
THOSE INTERNAL THINGS.

319

00:19:37,419 --> 00:19:39,899
THEN THE OTHER PART THAT'S A
LITTLE HARD TO DESCRIBE BUT WE

320

00:19:39,899 --> 00:19:43,409
HAVE A QUALIFICATION PROGRAM
WHERE YOU TAKE THE UNIT AND TEST

321

00:19:43,409 --> 00:19:47,690
IT TO THE EXTREMES.
WHERE YOU ACTUALLY -- ALL OF

322

00:19:47,690 --> 00:19:50,419
YOUR ACOUSTICS LOADS, ALL OF THE

OTHER THERMAL ENVIRONMENTS.

323

00:19:50,419 --> 00:19:53,580

THAT TESTING PROGRAM ON THE
TESTS TAKES TIME AND MONEY TO

324

00:19:53,580 --> 00:19:54,690

DO.

AND YOU WANT TO MAKE SURE YOU'VE

325

00:19:54,690 --> 00:19:57,090

TESTED IT ON THE GROUND BEFORE
YOU ACTUALLY PUT THE PEOPLE IN

326

00:19:57,090 --> 00:19:59,210

SPACE.

IT'S A COMBINATION OF ALL THOSE

327

00:19:59,210 --> 00:20:05,330

PIECES AND THE FLAT-LINE BUDGET
AND SOME OF OUR FIXED COSTS THAT

328

00:20:05,330 --> 00:20:09,230

DRIVE THE SCHEDULE TO THE RIGHT.
DOES THAT ANSWER YOUR QUESTION?

329

00:20:09,230 --> 00:20:13,249

>> SURE.

COULD YOU TALK ABOUT WHAT ELSE

330

00:20:13,249 --> 00:20:17,580

IS GOING TO BE NEEDED TO, AGAIN,
GET FROM THIS FIRST CREW VEHICLE

331

00:20:17,580 --> 00:20:20,580

TO -- WHAT OTHER SYSTEMS ARE
GOING TO BE NEEDED TO ENABLE A

332

00:20:20,580 --> 00:20:22,619

MARS-TYPE MISSION?

OBVIOUSLY IT'S NOT JUST THIS

333

00:20:22,619 --> 00:20:26,289

LITTLE CAPSULE THAT'S GOING TO
MAKE THAT JOURNEY.

334

00:20:26,289 --> 00:20:30,639

HOW MUCH MORE IS NEEDED TO DO A
MISSION TO MARS OR LAND

335

00:20:30,639 --> 00:20:32,559

ANYWHERE?

>> GOOD QUESTION.

336

00:20:32,559 --> 00:20:36,039

SO ORION CAN FIT IN ALL THESE
ARCHITECTURES.

337

00:20:36,039 --> 00:20:39,690

THE PART IT PROVIDES REALLY IS
THE PROVIDING A SAFE PLACE FOR

338

00:20:39,690 --> 00:20:42,859

THE CREW TO OPERATE.

AND IT GETS THEM OUT OF EARTH

339

00:20:42,859 --> 00:20:45,679

ORBIT AND THEN EVENTUALLY BACK
SAFELY ON THE GROUND.

340

00:20:45,679 --> 00:20:49,230

SO THAT'S THE PART IT PROVIDES.
AND IT PROVIDES THE CAPABILITY

341

00:20:49,230 --> 00:20:51,739

TO SUPPORT THE CREW FOR A
CERTAIN NUMBER OF DAYS.

342

00:20:51,739 --> 00:20:54,269

FOUR PEOPLE FOR 21 DAYS GIVES

YOU A SENSE.

343

00:20:54,269 --> 00:20:57,230

BUT WHEN YOU'RE GOING ALL THE
WAY TO MARS, WHICH CAN BE, YOU

344

00:20:57,230 --> 00:21:00,429

KNOW, NINE MONTHS TO A YEAR ONE
WAY, YOU'RE GOING TO NEED A

345

00:21:00,429 --> 00:21:04,259

BIGGER MODULE, OBVIOUSLY, MORE
SUPPLIES AND BIGGER PROPELLANT

346

00:21:04,259 --> 00:21:06,159

SYSTEMS TO DO THAT.
SO THAT'S THE PART THAT WOULD

347

00:21:06,159 --> 00:21:08,339

NEED TO BE ADDED LATER.
YES.

348

00:21:08,339 --> 00:21:10,749

>> LET ME ADD ANOTHER THING,
JAMES.

349

00:21:10,749 --> 00:21:14,679

THAT'S REALLY OR NOT IMPORTANT
TO ME AS ADMINISTRATOR, IN ORDER

350

00:21:14,679 --> 00:21:17,679

TO GET HUMANS TO MARS, THAT'S
HARD.

351

00:21:17,679 --> 00:21:21,869

SO WE NEED TO -- WE ALL NEED TO
AGREE WITH THAT, WHETHER YOU

352

00:21:21,869 --> 00:21:25,450

ACCEPT MY STATEMENT THERE OR NOT

IS IMMATERIAL, TO BE QUITE

353

00:21:25,450 --> 00:21:28,289

HONEST.

IT'S HARD TO DO THIS.

354

00:21:28,289 --> 00:21:32,519

WE HAVE TO BE ABLE TO GUARANTEE

THAT WE CAN SAFELY GET HUMANS

355

00:21:32,519 --> 00:21:35,440

THROUGH THE ENVIRONMENT OF

RADIATION AND EVERYTHING ELSE,

356

00:21:35,440 --> 00:21:41,570

AND WE WORK WITH TWO MATRICES.

ONE OF THEM DEALS WITH HUMAN

357

00:21:41,570 --> 00:21:45,210

PERFORMANCE AND HUMAN SURVIVAL.

AND OUR MATRIX SAYS THAT USING

358

00:21:45,210 --> 00:21:48,119

THE INTERNATIONAL SPACE STATION

IS THE DOMINANT PLATFORM FOR

359

00:21:48,119 --> 00:21:53,220

DEVELOPMENT OF PROCEDURES AND

PROTECTIVE DEVICES AND THE LIKE.

360

00:21:53,220 --> 00:21:58,019

WE'RE PROBABLY OUT TO 2026

BEFORE WE BUY DOWN ENOUGH RISK

361

00:21:58,019 --> 00:22:01,600

THAT WE'RE WILLING TO ETHICALLY

PUT HUMANS ON A SPACECRAFT AND

362

00:22:01,600 --> 00:22:06,470

TRY TO SEND THEM TO MARS.

WE'RE PROBABLY OUT TO 2025, 2026

363

00:22:06,470 --> 00:22:10,129

FROM A TECHNOLOGICAL PERSPECTIVE
BEFORE WE HAVE -- WE HAVE THE

364

00:22:10,129 --> 00:22:13,220

KNOWLEDGE ON THE ENVIRONMENTAL
SYSTEM BECAUSE UNLIKE SPACE

365

00:22:13,220 --> 00:22:18,460

STATION WHERE IF AN AMMONIA PUMP
BREAKS, WE PUT IT ON SOMETHING

366

00:22:18,460 --> 00:22:23,980

ON A SPACE-X DRAGON OR A CYGNUS
OR PROGRESS AND WE SEND UP A

367

00:22:23,980 --> 00:22:25,980

COMPONENT.
WE CAN'T DO THAT ON THE WAY TO

368

00:22:25,980 --> 00:22:28,159

MARS.
MARK'S GOT TO HAVE -- I'VE GOT

369

00:22:28,159 --> 00:22:33,249

TO GIVE HIM A CAPABILITY TO
BUILD A MUCH MORE RESILIENT

370

00:22:33,249 --> 00:22:36,529

ENVIRONMENTAL CONTROL AND LIFE
SUPPORT SYSTEM THAN WE HAVE

371

00:22:36,529 --> 00:22:38,029

TODAY.
WE DON'T HAVE IT YET.

372

00:22:38,029 --> 00:22:40,299

IT'S IN DEVELOPMENT.

AND A LOT OF IT'S BEING TESTED

373

00:22:40,299 --> 00:22:41,669

ON THE INTERNATIONAL SPACE
STATION.

374

00:22:41,669 --> 00:22:46,350

SO THAT'S THE PART OF -- THOSE
OF US WHO ARE HERE ON THIS SIDE

375

00:22:46,350 --> 00:22:49,919

OF THE LINE, WE RECOGNIZE THE
CHALLENGES WE HAVE AHEAD, AND

376

00:22:49,919 --> 00:22:53,799

THAT'S WHY THERE'S NOT THIS LOSS
OF MOMENTUM THAT YOU ASKED ABOUT

377

00:22:53,799 --> 00:22:56,340

EARLIER.
BUT FOR THE OUTSIDE, YOU WANT TO

378

00:22:56,340 --> 00:22:58,940

KNOW, OKAY, I SEE THIS VEHICLE.
WHY CAN'T WE JUST PUT HUMANS IN

379

00:22:58,940 --> 00:23:01,940

IT NEXT WEEK?
BECAUSE IT'S NOT READY.

380

00:23:01,940 --> 00:23:05,269

IT IS -- WE DON'T HAVE THE --
ALL THE TECHNOLOGY THAT WE WANT

381

00:23:05,269 --> 00:23:09,690

AND NEED, NOR DO WE HAVE THE
KNOWLEDGE THAT WE WANT AND NEED

382

00:23:09,690 --> 00:23:13,239

TO MAKE THAT TRIP SURVIVABLE BY

HUMANS.

383

00:23:13,239 --> 00:23:16,239

SO THERE ARE A LOT OF GAPS THAT
HAVE TO BE FILLED BETWEEN NOW

384

00:23:16,239 --> 00:23:20,379

AND THEN.

>> WE'RE ALSO GETTING A LOT OF

385

00:23:20,379 --> 00:23:21,570

GOOD QUESTIONS FROM SOCIAL
MEDIA.

386

00:23:21,570 --> 00:23:25,230

I'VE GOT A COUPLE HERE.

@KRISTI DID MARSHALL ASKED WHAT

387

00:23:25,230 --> 00:23:27,809

DATA WILL BE COLLECTED DURING
THE TEST FLIGHT?

388

00:23:27,809 --> 00:23:32,869

AND IN A RELATED QUESTION ASKED
WILL THE CAPSULE CARRY MORE

389

00:23:32,869 --> 00:23:39,869

SENSORS THAN A NORMAL FLIGHT.

>> FOR EFT-1 AND WE'RE LOOKING

390

00:23:40,409 --> 00:23:46,580

AT FOR THE FIRST TWO EXPLORATION
MISSION VEHICLES FOR EFT-1 WE'RE

391

00:23:46,580 --> 00:23:50,279

APPLYING 1200 ADDITIONAL SENSORS
FROM THE NOMINAL SET THAT WE

392

00:23:50,279 --> 00:23:53,600

WOULD LOOK AT ON EACH OF OUR

VEHICLES.

393

00:23:53,600 --> 00:24:00,239

SO WE'RE HEAVILY INSTRUMENTED IN
VIBRATION, IN TEMPERATURES, TO

394

00:24:00,239 --> 00:24:02,779

MAKE SURE THAT WE UNDERSTAND THE
ENVIRONMENTS.

395

00:24:02,779 --> 00:24:06,859

AND ALL OF THE EVENT TIMING TO
MAKE SURE ALL OF THE EVENTS

396

00:24:06,859 --> 00:24:08,479

HAPPEN WHEN THEY'RE SUPPOSED TO
BE HAPPENING.

397

00:24:08,479 --> 00:24:12,090

SO WE'RE HEAVILY INSTRUMENTED
FOR THIS VEHICLE, AND THAT HAS

398

00:24:12,090 --> 00:24:15,419

TAKEN UP QUITE A BIT OF THE
COMPUTER SPACE.

399

00:24:15,419 --> 00:24:19,070

WE'VE ACTUALLY ADDED SOME
DEVELOPMENT FLIGHT

400

00:24:19,070 --> 00:24:21,739

INSTRUMENTATION COMPUTERS JUST
TO HANDLE THE VOLUME OF THE DATA

401

00:24:21,739 --> 00:24:25,229

THAT WE WILL BE RECEIVING.
>> HI.

402

00:24:25,229 --> 00:24:31,929

I HAVE A QUESTION FOR MR. GEYER.

IS ORION STILL CONSIDERED A

403

00:24:31,929 --> 00:24:36,379

BACKUP FOR COMMERCIAL CREW?
AND IF SO, AT WHAT POINT IN THE

404

00:24:36,379 --> 00:24:40,059

TESTING PROGRAM WILL YOU NEED TO
DO TO PREPARE FOR A SPACE

405

00:24:40,059 --> 00:24:43,909

STATION MISSION, KIND OF DIVERGE
WHAT YOU'RE DOING FOR THE

406

00:24:43,909 --> 00:24:47,460

PRIMARY GOAL OF THE SPACECRAFT
TO DO THE DEEP SPACE

407

00:24:47,460 --> 00:24:49,690

EXPLORATION?
>> LET ME TAKE MARK OFF THE

408

00:24:49,690 --> 00:24:51,820

HOOK.
NO.

409

00:24:51,820 --> 00:24:56,169

ORION IS NOT CONSIDERED A BACKUP
FOR COMMERCIAL VEHICLES, FOR A

410

00:24:56,169 --> 00:24:59,940

NUMBER OF REASONS.
ONE IS WE MADE A COMMITMENT TO

411

00:24:59,940 --> 00:25:04,090

INDUSTRY THAT WE WOULD NOT
COMPETE WITH THEM.

412

00:25:04,090 --> 00:25:09,070

IF WE HAD SAID WE'RE GOING TO

KEEP ORION AS A BACKUP, THERE

413

00:25:09,070 --> 00:25:13,159

WERE SERIOUS DOUBTS AS TO
WHETHER INDUSTRY WOULD HAVE MADE

414

00:25:13,159 --> 00:25:16,649

THE INVESTMENT AT ALL IN A
COMMERCIAL CREW VEHICLE BECAUSE

415

00:25:16,649 --> 00:25:19,409

THEIR ASSUMPTION WAS, OKAY, IF
NASA IS GOING TO BUILD A

416

00:25:19,409 --> 00:25:22,789

VEHICLE, WHAT IS NASA GOING TO
USE?

417

00:25:22,789 --> 00:25:27,979

NATURALLY THEIR OWN VEHICLE.
ORION, WHILE IT CAN OR WILL BE

418

00:25:27,979 --> 00:25:31,570

CAPABLE OF GOING TO THE SPACE
STATION IS NOT DESIGNED TO DO

419

00:25:31,570 --> 00:25:34,859

THAT, NOT INTENDED TO DO THAT
AND IN NO WAY DO WE INTEND TO

420

00:25:34,859 --> 00:25:38,090

COMPETE WITH OUR INDUSTRY
PARTNERS.

421

00:25:38,090 --> 00:25:43,059

IT'S A BAD, BAD DAY WHEN WE HAVE
TO SEND ORION TO THE

422

00:25:43,059 --> 00:25:46,229

INTERNATIONAL SPACE STATION

BECAUSE IT MEANS EITHER WE'VE

423

00:25:46,229 --> 00:25:51,119

LOST EACH OF THE VEHICLES THAT
WAS DESIGNED TO DO THAT THROUGH

424

00:25:51,119 --> 00:25:55,690

SOME ACCIDENT OR THEY FAILED OR
SOMETHING, SO WE DON'T WANT TO

425

00:25:55,690 --> 00:25:57,529

HAVE TO RELY ON ORION TO DO
THAT.

426

00:25:57,529 --> 00:26:00,960

IT MEANS AMERICAN INDUSTRY HAS
FAILED.

427

00:26:00,960 --> 00:26:02,889

AND I DON'T THINK ANY OF US
WANTS TO SEE THAT.

428

00:26:02,889 --> 00:26:06,609

SO GET ORION GOING TO THE
INTERNATIONAL SPACE STATION OUT

429

00:26:06,609 --> 00:26:08,720

OF YOUR MIND.
I DON'T CARE WHAT ANYBODY SAYS.

430

00:26:08,720 --> 00:26:12,889

THAT IS NOT OUR INTENT.
IT'S NOT BEING BUILT THAT WAY.

431

00:26:12,889 --> 00:26:15,850

IT WOULD BE A WASTE OF THE
TAXPAYERS' MONEY, YOU KNOW, FOR

432

00:26:15,850 --> 00:26:19,519

ME TO ASK MARK TO CONFIGURE

ORION TO GO TO THE INTERNATIONAL

433

00:26:19,519 --> 00:26:26,519

SPACE STATION.

JUST BLUNTLY, OKAY?

434

00:26:28,539 --> 00:26:31,090

>> I HAVE A QUESTION FOR COLONEL

CABANA.

435

00:26:31,090 --> 00:26:35,029

CAN YOU ADDRESS THE SAFETY OF

ORION AS A FORMER SPACE SHUTTLE

436

00:26:35,029 --> 00:26:38,179

COMMANDER HOW MUCH, SAY, FOR

WHAT IT WOULD BE FOR ONE OF THE

437

00:26:38,179 --> 00:26:42,009

SHUTTLES THAT YOU FLEW?

>> I'D FLY ON THIS FOUR-HOUR

438

00:26:42,009 --> 00:26:46,340

FLIGHT IF IT WOULD GET ME OUT OF

A FEW MEETINGS.

439

00:26:46,340 --> 00:26:48,779

ORION IS SAFE.

AND IN MANY WAYS.

440

00:26:48,779 --> 00:26:50,720

YOU KNOW, ONE OF THE THINGS THAT

WE LOOKED AT AFTER "COLUMBIA,"

441

00:26:50,720 --> 00:26:55,019

AND THE TEAM DID A PHENOMENAL

JOB.

442

00:26:55,019 --> 00:27:00,779

WE WERE TALKING THIS MORNING HOW

CLEAN ATLANTIS WAS.

443

00:27:00,779 --> 00:27:04,369

BUT HAVING THE CAPSULE UP ON TOP
OF THE ROCKET OUT OF THAT DEBRIS

444

00:27:04,369 --> 00:27:07,239

ENVIRONMENT, HAVING AN ESCAPE
SYSTEM ON THE CAPSULE THAT CAN

445

00:27:07,239 --> 00:27:12,779

GET THE CREW FROM ANY TIME FROM
LIFTOFF TO MAIN ENGINE CUTOFF

446

00:27:12,779 --> 00:27:16,999

SAFELY BACK TO EARTH WITH NO
BLACK ZONES, THIS IS GOING TO BE

447

00:27:16,999 --> 00:27:20,830

A MUCH SAFER VEHICLE IN THE
LAUNCH ENVIRONMENT THAN THE

448

00:27:20,830 --> 00:27:24,349

SHUTTLE WAS.
SO I THINK THE TEAM IS JUST

449

00:27:24,349 --> 00:27:31,349

DOING AN OUTSTANDING JOB.
AND I'D FLY ON IT TOMORROW.

450

00:27:33,070 --> 00:27:34,549

>> EXCEPT I WON'T LET HIM.
>> WE HAVE TIME FOR ONE MORE IF

451

00:27:34,549 --> 00:27:38,120

THERE'S ONE LAST QUESTION.
GO AHEAD, DAVID.

452

00:27:38,120 --> 00:27:43,759

>> I'LL NARROW IT TO ONE.

GENERAL BOLDEN, IN THE CONTEXT

453

00:27:43,759 --> 00:27:48,210
OF THE DISCUSSION ABOUT ORION AS
A POTENTIAL BACKUP VEHICLE, CAN

454

00:27:48,210 --> 00:27:52,169
YOU SAY, IS NASA COMMITTED TO
MULTIPLE COMMERCIAL FLIGHTS

455

00:27:52,169 --> 00:27:56,309
COMING UP THIS SUMMER?
HOW MANY SHOULD WE EXPECT?

456

00:27:56,309 --> 00:27:59,109
>> WITHOUT GETTING IN TROUBLE
HERE AND TRYING TO GET INTO BILL

457

00:27:59,109 --> 00:28:04,359
GERSTENMAIER'S JOB, BILL IS THE
HEAD OF HUMAN EXPLORATION IS THE

458

00:28:04,359 --> 00:28:07,679
SOURCE SELECTION OFFICIAL, SO I
WON'T EVEN VENTURE TO TRY TO

459

00:28:07,679 --> 00:28:10,269
GUESS.
OUR DESIRE IS TO HAVE MULTIPLE

460

00:28:10,269 --> 00:28:11,970
PROVIDERS.
WHY?

461

00:28:11,970 --> 00:28:16,489
BECAUSE IT MAINTAINS
COMPETITION, SO IT HOLDS THE

462

00:28:16,489 --> 00:28:21,249
COSTS DOWN.

IT GIVES US RELIABILITY AND

463

00:28:21,249 --> 00:28:24,200

REDUNDANCY.

IF WE ONLY HAVE ONE U.S.

464

00:28:24,200 --> 00:28:27,029

PROVIDER, THEN WE'RE BACK TO

WHERE WE WERE BEFORE, WHERE WE

465

00:28:27,029 --> 00:28:29,830

HAVE SHUTTLE AND SOYUZ, AND WE

KNOW WHAT THAT'S LIKE.

466

00:28:29,830 --> 00:28:33,159

WE DON'T WANT TO BE THERE.

SO OUR COMMITMENT IS TO TRY TO

467

00:28:33,159 --> 00:28:36,999

HAVE MORE THAN ONE PROVIDER.

THE BUDGET WILL DETERMINE THAT

468

00:28:36,999 --> 00:28:40,690

TO A GREAT EXTENT.

>> AND MORE THAN ONE DOESN'T

469

00:28:40,690 --> 00:28:45,139

MEAN FRACTIONS LIKE WE'VE SEEN

SOMEWHAT SO FAR, RIGHT?

470

00:28:45,139 --> 00:28:47,880

IT'S EITHER FULL OR IT'S NOT,

RIGHT?

471

00:28:47,880 --> 00:28:51,710

>> YOU'RE GETTING INTO -- YOU'RE

GETTING INTO -- WHAT DO WE CALL

472

00:28:51,710 --> 00:28:54,859

THIS?

I DON'T WANT TO GO THERE.

473

00:28:54,859 --> 00:28:58,559

LET ME NOT DO THAT BECAUSE I
DON'T KNOW -- I WILL INFRINGE

474

00:28:58,559 --> 00:29:02,440

UPON SOMETHING THAT'S GOING TO
GET ME IN LEGAL PROBLEMS.

475

00:29:02,440 --> 00:29:06,289

BUT LET'S JUST SAY MORE THAN ONE
PROVIDER MEANS WHEN WE START

476

00:29:06,289 --> 00:29:10,509

FLYING HUMANS ON COMMERCIAL
SPACECRAFT LIKE IN 2017,

477

00:29:10,509 --> 00:29:15,830

IDEALLY, I WOULD LIKE TO HAVE
TWO PEOPLE, AT LEAST, WHO CAN

478

00:29:15,830 --> 00:29:20,029

PROVIDE TRANSPORTATION FOR OUR
CREW EITHER TODAY OR PRETTY SOON

479

00:29:20,029 --> 00:29:22,229

AFTER THAT.
SO THAT'S ALL I'M GOING TO SAY

480

00:29:22,229 --> 00:29:24,899

AND STAY OUT OF ACQUISITION AND
PROCUREMENT PROBLEMS.

481

00:29:24,899 --> 00:29:28,239

OKAY?
AND I HOPE YOU APPRECIATE THE

482

00:29:28,239 --> 00:29:31,009

SUBTLETY THERE.

ALL RIGHT?

483

00:29:31,009 --> 00:29:32,389

YEAH.

>> OKAY.

484

00:29:32,389 --> 00:29:38,190

WELL, I WOULD LIKE TO THANK OUR
PARTICIPANTS FOR TALKING TODAY.

485

00:29:38,190 --> 00:29:40,539

AND ALSO THANK YOU ALL FOR
JOINING US.

486

00:29:40,539 --> 00:29:47,539

YOU CAN FOLLOW ORION'S PROGRESS
AT WWW.NASA.GOV/ORION.

487

00:29:48,099 --> 00:29:51,450

AND FOR INFORMATION ON ALL OF
THE PROGRESS WE'RE MAKING TO

488

00:29:51,450 --> 00:29:55,190

SEND HUMANS ON THE PATH TO MARS,
YOU CAN VISIT