



1  
00:00:03,060 --> 00:00:08,580  
>>> GOOD MORNING, EVERYBODY, AND  
WELCOME TO THE NASA SOCIAL AT

2  
00:00:08,580 --> 00:00:17,730  
KENNEDY SPACE CENTER IN FLORIDA.

3  
00:00:17,730 --> 00:00:19,560  
OKAY.

4  
00:00:19,560 --> 00:00:22,390  
I'M JOHN WITH NASA PUBLIC  
AFFAIRS.

5  
00:00:22,390 --> 00:00:26,000  
TODAY AND TOMORROW IS THE SOCIAL  
EVENT.

6  
00:00:26,000 --> 00:00:29,249  
FOR THOSE WHO DON'T KNOW WHAT A  
NASA SOCIAL IS, THOSE PEOPLE

7  
00:00:29,249 --> 00:00:31,850  
WATCHING ON TELEVISION, PROBABLY  
EVERYONE IN THE ROOM KNOWS, IT'S

8  
00:00:31,850 --> 00:00:35,980  
AN EVENT WHERE WE ASK PEOPLE  
FOLLOWING US ON SOCIAL MEDIA TO

9  
00:00:35,980 --> 00:00:38,950  
COME OUT TO ONE OF OUR NASA  
FACILITIES AND GET BEHIND THE

10  
00:00:38,950 --> 00:00:41,680  
SCENES ACCESS TO WHAT WE'RE  
DOING AT NASA.

11  
00:00:41,680 --> 00:00:44,850

YOU'RE SEEING FACILITIES AND  
MEETING PEOPLE THAT OTHER PEOPLE

12

00:00:44,850 --> 00:00:47,420

IN THE WORLD DON'T REALLY GET A  
CHANCE TO SEE.

13

00:00:47,420 --> 00:00:49,190

IF WE COULD INVITE EVERY SINGLE  
PERSON IN THE UNITED STATES TO

14

00:00:49,190 --> 00:00:51,850

COME OUT AND SEE FIRSTHAND WHAT  
NASA IS DOING, WE WOULD LOVE TO

15

00:00:51,850 --> 00:00:52,850

DO THAT.

16

00:00:52,850 --> 00:00:54,880

UNFORTUNATELY THAT'S NOT  
POSSIBLE.

17

00:00:54,880 --> 00:00:57,570

YOU KNOW, THE MEDIA HAS BEEN  
TELLING OUR STORY FOR 50 YEARS.

18

00:00:57,570 --> 00:00:59,240

NOW YOU'RE HELPING TELL OUR  
STORY.

19

00:00:59,240 --> 00:01:01,740

PEOPLE AROUND THE WORLD ON  
SOCIAL MEDIA, THOSE PEOPLE HERE

20

00:01:01,740 --> 00:01:04,580

TODAY, YOU'RE GOING TO BE  
TWEETING AND POSTING WITH THE

21

00:01:04,580 --> 00:01:05,780

THINGS YOU'RE SEEING HERE TODAY.

22  
00:01:05,780 --> 00:01:08,100  
HOPEFULLY PEOPLE FOLLOWING YOU  
WILL SEE IT AND GET INSPIRED AND

23  
00:01:08,100 --> 00:01:10,399  
LEARN A LITTLE ABOUT WHAT WE'RE  
DOING.

24  
00:01:10,399 --> 00:01:14,600  
THE REASON WHY WE DO THESE AND  
THE THEME FOR THIS ONE IS NASA

25  
00:01:14,600 --> 00:01:16,159  
AND COMMERCIAL SPACE FLIGHT.

26  
00:01:16,159 --> 00:01:20,920  
AND, OF COURSE, WE HAVE SPACE X  
LAUNCH TOMORROW, THEIR FIRST

27  
00:01:20,920 --> 00:01:25,009  
TEST FLIGHT TO TRY TO BIRTH WITH  
THE INTERNATIONAL SPACE STATION.

28  
00:01:25,009 --> 00:01:27,280  
SO THIS IS A BIG MILESTONE FOR  
COMMERCIAL.

29  
00:01:27,280 --> 00:01:30,950  
YOU KNOW, DECEMBER 2010, THEY  
HAD THEIR FIRST ORBITAL FLIGHT.

30  
00:01:30,950 --> 00:01:33,650  
AND NOW WE'RE TRYING TO  
RENDEZVOUS WITH THE SPACE

31  
00:01:33,650 --> 00:01:36,039  
STATION WHICH IS AN AMAZING FEAT  
TO TRY TO DO.

32

00:01:36,039 --> 00:01:39,479

AND IT'S REALLY A GAME CHANGER  
TO WHAT WE TRADITIONAL THOUGHT

33

00:01:39,479 --> 00:01:43,200

OF AS HUMANS AND CARGO FLYING IN  
SPACE.

34

00:01:43,200 --> 00:01:45,509

SO CONGRATULATIONS, SPACE X, FOR  
THE ATTEMPT.

35

00:01:45,509 --> 00:01:46,509

IT'S QUITE A FEAT.

36

00:01:46,509 --> 00:01:49,619

WE'LL BE TALKING ABOUT THAT AND  
THE INTERNATIONAL SPACE STATION

37

00:01:49,619 --> 00:01:53,500

AND THE WORK BEING DONE HERE AT  
KENNEDY AND HOPEFULLY PEOPLE

38

00:01:53,500 --> 00:01:56,350

HAVE QUESTIONS HERE IN THE ROOM  
THEY CAN SHARE WITH THE AUDIENCE

39

00:01:56,350 --> 00:02:00,689

HERE ON NASA TELEVISION.

40

00:02:00,689 --> 00:02:01,689

SO THIS IS A NASA SOCIAL.

41

00:02:01,689 --> 00:02:05,979

SOME PEOPLE ARE, LIKE, WHAT IS  
EXACTLY A SOCIAL?

42

00:02:05,979 --> 00:02:09,920

SO WE CHANGED EARLIER THIS YEAR,

WE CHANGED NASA SOCIAL TO NASA

43

00:02:09,920 --> 00:02:11,039

TWEET-UP.

44

00:02:11,039 --> 00:02:13,150

AND THERE WAS SOME BACKLASH,  
I'LL BE HONEST.

45

00:02:13,150 --> 00:02:15,360

PEOPLE WERE, LIKE, WHY WOULD YOU  
CHANGE IT?

46

00:02:15,360 --> 00:02:16,360

IT'S WORKING.

47

00:02:16,360 --> 00:02:17,860

TWEET-UP IS GOOD.

48

00:02:17,860 --> 00:02:19,650

OH, YEAH, YEAH.

49

00:02:19,650 --> 00:02:21,709

SO THERE WAS SOME BACKLASH ABOUT  
IT.

50

00:02:21,709 --> 00:02:26,430

GOING FROM TWEET-UP TO NASA  
SOCIAL.

51

00:02:26,430 --> 00:02:27,430

PEOPLE WERE COMFORTABLE.

52

00:02:27,430 --> 00:02:28,599

THERE WAS A COMMUNITY BUILT.

53

00:02:28,599 --> 00:02:34,010

THEY UNDERSTAND THE HASH TAG AND  
IT'S A LOT EASIER TO INTERACT

54

00:02:34,010 --> 00:02:35,010  
WITH EACH OTHER.

55

00:02:35,010 --> 00:02:37,200  
A LOT OF FACEBOOK PAGES ARE  
CLOSED.

56

00:02:37,200 --> 00:02:39,599  
PEOPLE WERE ASKING WHY ARE YOU  
DOING THIS?

57

00:02:39,599 --> 00:02:41,890  
IT DIDN'T QUITE CLICK WITH THEM.

58

00:02:41,890 --> 00:02:44,810  
AND THE ONLY ANSWER I CAN REALLY  
GIVE YOU IS THE WORLD IS IN

59

00:02:44,810 --> 00:02:47,810  
COMMUNICATIONS AND SOCIAL MEDIA  
IS EVOLVING.

60

00:02:47,810 --> 00:02:51,019  
AND IT'S NOT NECESSARILY THIS  
WAS TO INCORPORATE THINGS RIGHT

61

00:02:51,019 --> 00:02:53,100  
NOW, BUT THE IDEA IS WE WANT TO  
STAY HUNGRY.

62

00:02:53,100 --> 00:02:55,300  
WE WANT TO EMBRACE NEW  
TECHNOLOGIES.

63

00:02:55,300 --> 00:02:58,980  
IT WASN'T THAT LONG AGO -- YOU  
THINK ABOUT IT, FIVE YEARS AGO,

64

00:02:58,980 --> 00:03:01,989  
FIVE YEARS AGO THE WAY WE  
COMMUNICATED AS A SPECIES WAS

65  
00:03:01,989 --> 00:03:03,220  
DIFFERENT THAN IT IS TODAY.

66  
00:03:03,220 --> 00:03:04,719  
THE THINGS -- THE PLATFORMS  
YOU'RE USING AND YOU'RE

67  
00:03:04,719 --> 00:03:06,880  
COMMUNICATING ON TODAY, THOSE  
WEREN'T AROUND.

68  
00:03:06,880 --> 00:03:09,140  
SOME OF THEM WERE AROUND BUT  
THEY WEREN'T WIDESPREAD LIKE

69  
00:03:09,140 --> 00:03:10,299  
THEY ARE TODAY.

70  
00:03:10,299 --> 00:03:11,299  
FIVE YEARS.

71  
00:03:11,299 --> 00:03:13,150  
I MEAN, IT USED TO BE A TIME  
WHERE PEOPLE WOULD GATHER AROUND

72  
00:03:13,150 --> 00:03:16,829  
THE TELEVISION, THE WHOLE FAMILY  
WOULD SIT THERE AND WATCH AND

73  
00:03:16,829 --> 00:03:18,610  
THEY GOT THEIR NEWS FROM A  
SINGLE SOURCE.

74  
00:03:18,610 --> 00:03:19,610  
MAYBE THEY GOT A NEWSPAPER.

75

00:03:19,610 --> 00:03:21,270

MAYBE IT WAS TWO SOURCES.

76

00:03:21,270 --> 00:03:23,930

HOW MANY SOURCES DO YOU GUYS GET  
YOUR INFORMATION FROM NOW?

77

00:03:23,930 --> 00:03:26,099

THINK ABOUT THAT.

78

00:03:26,099 --> 00:03:30,410

BEFORE THAT, IT WAS PEOPLE WERE  
USING, YOU KNOW, PONY EXPRESS.

79

00:03:30,410 --> 00:03:32,219

AND THEY WERE GOING AROUND THE  
RADIO BEFORE THAT.

80

00:03:32,219 --> 00:03:36,400

AND PEOPLE, YOU KNOW,  
COMMUNICATING VIA WRITTEN

81

00:03:36,400 --> 00:03:37,400

MATERIAL.

82

00:03:37,400 --> 00:03:39,269

I MEAN, I WAS READING A BOOK ON  
THE CIVIL WAR, AND IT WAS

83

00:03:39,269 --> 00:03:42,099

AMAZING TO ME THAT THE WAR HAD  
ENDED AND PEOPLE WERE STILL

84

00:03:42,099 --> 00:03:43,540

FIGHTING AND DYING.

85

00:03:43,540 --> 00:03:46,170

IT'S LIKE NOWADAYS, IT'S LIKE I  
CAN TWEET SOMETHING AND SOMEONE

86  
00:03:46,170 --> 00:03:48,989  
OUT OF MONGOLIA CAN READ THAT IN  
SECONDS.

87  
00:03:48,989 --> 00:03:50,140  
AND THAT'S WHAT THE AMAZING  
THING IS.

88  
00:03:50,140 --> 00:03:51,780  
THAT'S WHY WE'RE DOING THIS.

89  
00:03:51,780 --> 00:03:53,530  
AND THAT'S WHY WE'RE CHANGING IT  
AND WE'RE GOING TO KEEP LOOKING

90  
00:03:53,530 --> 00:03:57,310  
AT NEW VENUES, NEW PLATFORMS,  
NEW WAYS TO TELL OUR STORY TO

91  
00:03:57,310 --> 00:04:00,370  
REACH AS MANY PEOPLE AS POSSIBLE  
TO REALLY UNDERSTAND WHAT NASA

92  
00:04:00,370 --> 00:04:03,209  
DOES.

93  
00:04:03,209 --> 00:04:05,390  
THAT'S KIND OF THE LITTLE  
BACKGROUND OF WHAT IT IS

94  
00:04:05,390 --> 00:04:06,390  
EXACTLY.

95  
00:04:06,390 --> 00:04:08,760  
AND THEN I WANT TO GIVE YOU A  
QUICK BACKGROUND OF WHAT WE DO,

96  
00:04:08,760 --> 00:04:11,230

WHY NASA IS ON SOCIAL MEDIA.

97

00:04:11,230 --> 00:04:13,590  
AND SO WE HAVE, AS MOST OF YOU  
KNOW, WE HAVE OVER 2 MILLION

98

00:04:13,590 --> 00:04:15,280  
FOLLOWERS ON TWITTER, FOR  
EXAMPLE.

99

00:04:15,280 --> 00:04:18,030  
WE'RE GETTING TO A MILLION LIKES  
ON FACEBOOK.

100

00:04:18,030 --> 00:04:19,870  
WE'RE GETTING INVOLVED IN GOOGLE  
PLUS.

101

00:04:19,870 --> 00:04:22,430  
BUT THIS WASN'T ALWAYS THE CASE.

102

00:04:22,430 --> 00:04:25,110  
AND I'M REALLY PROUD OF THE FACT  
THAT NASA WAS ONE OF THE FIRST

103

00:04:25,110 --> 00:04:27,130  
PEOPLE TO REALLY EMBRACE SOCIAL  
MEDIA.

104

00:04:27,130 --> 00:04:30,080  
ESPECIALLY FOR A FEDERAL AGENCY  
WHICH USUALLY DOES THINGS MUCH

105

00:04:30,080 --> 00:04:31,690  
SLOWER THAN THE REST OF THE  
WORLD.

106

00:04:31,690 --> 00:04:34,750  
WE JUMPED THE BOARD REALLY  
QUICKLY.

107  
00:04:34,750 --> 00:04:37,240  
AND I WAS -- I'M THE ACTING  
SOCIAL MEDIA MANAGER FOR NASA

108  
00:04:37,240 --> 00:04:38,240  
RIGHT NOW.

109  
00:04:38,240 --> 00:04:39,949  
I WAS DOING AN INTERVIEW WITH A  
REPORTER.

110  
00:04:39,949 --> 00:04:43,400  
AND ONE OF THE QUESTIONS HE  
ASKED ME WAS WHY DID YOU START

111  
00:04:43,400 --> 00:04:44,419  
GETTING INVOLVED WITH SOCIAL  
MEDIA?

112  
00:04:44,419 --> 00:04:48,139  
AND I THOUGHT HE WAS ASKING ME  
SPECIFICALLY WHY I DID.

113  
00:04:48,139 --> 00:04:50,830  
AND I SAID, I COULD HAVE SAID,  
WELL, ENGAGING A NEW AUDIENCE

114  
00:04:50,830 --> 00:04:52,490  
AND REACHING A NEW COMMUNITY.

115  
00:04:52,490 --> 00:04:55,710  
I SAID, WELL, MY BOSS TOLD ME TO  
DO IT.

116  
00:04:55,710 --> 00:04:56,800  
AND HE WAS A LITTLE SHOCKED.

117  
00:04:56,800 --> 00:04:57,800

BUT THAT'S THE TRUTH.

118

00:04:57,800 --> 00:05:00,050

BUT THAT WAS THE ANSWER.

119

00:05:00,050 --> 00:05:04,229

MANAGEMENT HERE AT NASA REALLY  
SAW HOW IMPORTANT THIS WAS.

120

00:05:04,229 --> 00:05:07,080

AND PUBLIC AFFAIRS OFFICERS LIKE  
ME WHO GREW UP WRITING PRESS

121

00:05:07,080 --> 00:05:10,110

RELEASES, FAXING REPORTERS,  
DOING INTERVIEWS DIDN'T SEE THE

122

00:05:10,110 --> 00:05:11,110

VALUE.

123

00:05:11,110 --> 00:05:12,169

IT WAS JUST ONE MORE THING I HAD  
TO DO.

124

00:05:12,169 --> 00:05:13,169

FRANKLY, I DIDN'T REALLY LIKE  
IT.

125

00:05:13,169 --> 00:05:15,289

IT WAS LIKE ANOTHER TASK I HAD  
TO THINK OF ON TOP OF EVERYTHING

126

00:05:15,289 --> 00:05:16,479

ELSE.

127

00:05:16,479 --> 00:05:18,260

WHAT WAS I DOING?

128

00:05:18,260 --> 00:05:22,479

I WAS, YOU KNOW, TAKING  
INFORMATION AND POSTING IT ON

129

00:05:22,479 --> 00:05:24,410  
SOCIAL MEDIA JUST LIKE I WAS  
DOING ANYTHING ELSE.

130

00:05:24,410 --> 00:05:25,620  
POSTING THINGS TO THE WEB.

131

00:05:25,620 --> 00:05:28,030  
SO WHAT TURNED ME AROUND -- AND  
THIS IS WHAT I TOLD THE

132

00:05:28,030 --> 00:05:30,850  
REPORTER -- WHAT REALLY TURNED  
ME AROUND WAS, I REMEMBER

133

00:05:30,850 --> 00:05:33,970  
SPECIFICALLY, I WAS DOING THIS  
PART OF MY JOB, AND IT WAS

134

00:05:33,970 --> 00:05:37,630  
DURING THE STS-125 MISSION WHICH  
WAS THE LAST SERVICE MISSION TO

135

00:05:37,630 --> 00:05:39,449  
THE HUBBLE SPACE TELESCOPE.

136

00:05:39,449 --> 00:05:42,130  
AND WHAT HAPPENED THIS, I WAS  
DOING MY JOB.

137

00:05:42,130 --> 00:05:43,360  
I WAS POSTING STUFF TO THE WEB.

138

00:05:43,360 --> 00:05:44,610  
I WAS WRITING NEWS RELEASES.

139

00:05:44,610 --> 00:05:49,639  
AND ALL OF A SUDDEN -- AND I WAS  
POSTING THINGS ON TWITTER.

140  
00:05:49,639 --> 00:05:53,230  
I WAS POSTING, LIKE, YOU KNOW,  
THE SPACE SHUTTLE "DISCOVERY"

141  
00:05:53,230 --> 00:05:57,460  
WILL DOCK AT 8:55 A.M., FOLLOW  
US LIVE ON NASA.GOV.

142  
00:05:57,460 --> 00:06:00,930  
THAT SORT OF THING.

143  
00:06:00,930 --> 00:06:02,440  
THAT WAS MY BASIC PUTTING  
INFORMATION OUT THERE.

144  
00:06:02,440 --> 00:06:03,830  
I WAS GOING ON TO SOMETHING  
ELSE.

145  
00:06:03,830 --> 00:06:06,220  
I DECIDED I WAS GOING TO CHECK  
TO SEE WHAT PEOPLE WERE DOING

146  
00:06:06,220 --> 00:06:07,220  
WITH THE INFORMATION I WAS  
SENDING.

147  
00:06:07,220 --> 00:06:09,870  
ALL OF A SUDDEN I GOT AMAZED  
WHAT I WAS READING.

148  
00:06:09,870 --> 00:06:13,259  
I NEVER PAID ATTENTION TO PEOPLE  
WERE SHARING AND RETWEETING THIS

149  
00:06:13,259 --> 00:06:14,259

STUFF.

150

00:06:14,259 --> 00:06:15,259

I DIDN'T QUITE GET IT.

151

00:06:15,259 --> 00:06:17,729

AND THAT MOMENT I STARTED REALLY GETTING INTO IT.

152

00:06:17,729 --> 00:06:20,919

PEOPLE WERE SAYING, OH, MY GOD, I CAN'T GO BACK TO WORK NOW.

153

00:06:20,919 --> 00:06:22,330

WHAT'S GOING TO HAPPEN HERE?

154

00:06:22,330 --> 00:06:24,539

IF YOU REMEMBER THAT SHUTTLE MISSION, THERE WAS A LOT OF

155

00:06:24,539 --> 00:06:26,699

CRAZY THINGS HAPPENING, A LOT OF REALTIME PROBLEMS WITH THE

156

00:06:26,699 --> 00:06:28,690

SPACEWALKS THEY HAD TO WORK THROUGH.

157

00:06:28,690 --> 00:06:32,410

AND THE AMAZING THING THAT HAPPENED WAS, I GOT ADDICTED TO

158

00:06:32,410 --> 00:06:33,410

IT.

159

00:06:33,410 --> 00:06:34,410

ALL OF A SUDDEN SOMEONE ASKED A QUESTION, OH, I KNOW THE ANSWER

160

00:06:34,410 --> 00:06:38,130  
AND START WRITING ABOUT IT.

161  
00:06:38,130 --> 00:06:40,919  
THEY WERE ACTUALLY ENGAGED, AND  
I DIDN'T REALIZE IT WAS A

162  
00:06:40,919 --> 00:06:43,509  
CONVERSATION WE WERE SUPPOSED TO  
BE HAVING WITH THE PEOPLE ON

163  
00:06:43,509 --> 00:06:44,509  
SOCIAL MEDIA.

164  
00:06:44,509 --> 00:06:46,330  
AND ALL OF A SUDDEN THEY CLICKED  
WHY THIS WAS IMPORTANT.

165  
00:06:46,330 --> 00:06:48,220  
ALL MY LIFE I HAD BEEN  
COMMUNICATING WITH REPORTERS.

166  
00:06:48,220 --> 00:06:50,680  
NOW I'M SEEING PEOPLE LOVING AND  
ENGAGING WHAT WE WERE DOING.

167  
00:06:50,680 --> 00:06:55,159  
IT WASN'T ABOUT JUST WHAT WENT  
WRONG, IT WAS ABOUT WHAT WENT

168  
00:06:55,159 --> 00:06:56,819  
RIGHT.

169  
00:06:56,819 --> 00:06:59,430  
THEY LOVED WHAT NASA WAS DOING.

170  
00:06:59,430 --> 00:07:01,490  
THEY WERE INSPIRED BY WHAT NASA  
WAS DOING.

171

00:07:01,490 --> 00:07:08,629

I'VE GOT TO TELL YOU, I BECAME A  
ZEALOT, AND I'M REALLY PROUD TO

172

00:07:08,629 --> 00:07:09,629

BE PART OF THIS TEAM.

173

00:07:09,629 --> 00:07:11,330

I'VE GOT TO TELL YOU IT REALLY  
IS A TEAM EFFORT.

174

00:07:11,330 --> 00:07:14,360

EVERY FIELD HAS A LEAD.

175

00:07:14,360 --> 00:07:18,780

WE HAVE THREE PEOPLE AT NASA  
HEADQUARTERS DOING IT.

176

00:07:18,780 --> 00:07:20,300

IT'S KIND OF A CRAZY THING  
BECAUSE THERE ARE SO MANY

177

00:07:20,300 --> 00:07:21,740

ACCOUNTS OUT THERE.

178

00:07:21,740 --> 00:07:26,840

BUT NASA'S DOING A LOT OF  
AMAZING THINGS.

179

00:07:26,840 --> 00:07:30,530

YOU KNOW, RECENTLY, YOU KNOW,  
OTHER GOVERNMENT AGENCIES HAVE

180

00:07:30,530 --> 00:07:33,800

BEEN CONTACTING US, WHAT ARE  
SOME OF YOUR BEST PRACTICES?

181

00:07:33,800 --> 00:07:36,020

PEOPLE ASK US TO TALK ABOUT IT.

182

00:07:36,020 --> 00:07:37,670

REALLY I WANT TO TAKE CREDIT  
SOMETIMES.

183

00:07:37,670 --> 00:07:41,410

YEAH, WELL, WE STARTED OFF DOING  
THIS BECAUSE WE WERE REALLY

184

00:07:41,410 --> 00:07:43,340

AWESOME AND WE SAW, AHEAD OF  
EVERYBODY ELSE.

185

00:07:43,340 --> 00:07:45,320

BUT THE TRUTH IS, IT'S NASA.

186

00:07:45,320 --> 00:07:47,370

THE INFORMATION WE'RE PUTTING  
OUT THERE IS COOL.

187

00:07:47,370 --> 00:07:50,280

I MEAN, SOME AGENCIES WILL HAVE  
A LOT HARDER TIME GETTING 2

188

00:07:50,280 --> 00:07:51,630

MILLION FOLLOWERS ON FACEBOOK.

189

00:07:51,630 --> 00:07:55,131

EXCUSE ME, LIKES, A MILLION  
LIKES ON FACEBOOK AND 2 MILLION

190

00:07:55,131 --> 00:07:58,340

FOLLOWERS ON TWITTER IF THEY'RE  
TALKING ABOUT SOME OF THE THINGS

191

00:07:58,340 --> 00:08:00,480

THAT THEY'RE DOING, SERVICES  
THEY'RE PROVIDING.

192

00:08:00,480 --> 00:08:01,830  
IT'S NOT THAT THEY'RE NOT  
IMPORTANT.

193  
00:08:01,830 --> 00:08:03,689  
IT JUST DOESN'T ENGAGE THE  
AUDIENCE AND THE COMMUNITY THE

194  
00:08:03,689 --> 00:08:05,610  
SAME WAY THAT NASA DOES.

195  
00:08:05,610 --> 00:08:07,201  
SO WE HAVE A REALLY COOL THING.

196  
00:08:07,201 --> 00:08:08,419  
I THINK IT'S REALLY RELATABLE.

197  
00:08:08,419 --> 00:08:09,860  
I MEAN, WE DO HELIO PHYSICS.

198  
00:08:09,860 --> 00:08:12,050  
YOU FEEL THE SUN EVERY DAY.

199  
00:08:12,050 --> 00:08:13,880  
YOU LOOK AT THE MOON IN THE  
NIGHT SKY, WE HAVE THINGS

200  
00:08:13,880 --> 00:08:18,009  
ORBITING THE MOON, EARTH  
OBSERVATION SATELLITES THAT'S

201  
00:08:18,009 --> 00:08:20,479  
STUDYING THE PLANET.

202  
00:08:20,479 --> 00:08:23,400  
WE HAVE A SPACECRAFT THAT'S  
FINDING NEW WORLDS IN DISTANT

203  
00:08:23,400 --> 00:08:24,400

STARS.

204

00:08:24,400 --> 00:08:25,850

WE ARE DOING THINGS THAT REALLY  
INSPIRE PEOPLE.

205

00:08:25,850 --> 00:08:27,970

AND YOU GUYS ARE HELPING US TELL  
THAT STORY.

206

00:08:27,970 --> 00:08:31,259

AND THIS IS WHY NASA IS  
SUCCESSFUL, AND IT'S REALLY

207

00:08:31,259 --> 00:08:33,710

PARTLY THE TEAM BUT PARTLY THE  
PRODUCT AND ALL THE PEOPLE THAT

208

00:08:33,710 --> 00:08:35,169

WORK THROUGHOUT THIS AGENCY.

209

00:08:35,169 --> 00:08:39,370

SO THAT'S WHY I GOT HOOKED ON  
IT.

210

00:08:39,370 --> 00:08:40,370

THAT'S WHY I'M HERE TODAY.

211

00:08:40,370 --> 00:08:43,870

I REALLY WANT TO ASK A COUPLE  
QUESTIONS BECAUSE I WANT TO

212

00:08:43,870 --> 00:08:46,600

SEPARATE -- I KNOW SOME OF YOU  
ARE SPACE GEEKS.

213

00:08:46,600 --> 00:08:48,740

WE ALL DID SOME INTRODUCTIONS  
BEFORE WE GOT STARTED.

214

00:08:48,740 --> 00:08:54,940

I WANT TO SEPARATE THE SPACE  
GEEKS FROM THE UBER SPACE GEEKS.

215

00:08:54,940 --> 00:08:56,420

SO SOME OF THESE ARE GOING TO BE  
REALLY EASY.

216

00:08:56,420 --> 00:08:57,630

RAISE YOUR HAND IF YOU KNOW THE  
ANSWER.

217

00:08:57,630 --> 00:09:00,470

CAN I GET A MIKE HANDLER?

218

00:09:00,470 --> 00:09:01,890

A MIKE HANDLER?

219

00:09:01,890 --> 00:09:06,230

OKAY, FIRST QUESTION IS,  
TOMORROW'S LAUNCH IS -- YOU

220

00:09:06,230 --> 00:09:07,970

KNOW, WE KEEP SAYING COST  
LAUNCH.

221

00:09:07,970 --> 00:09:13,339

CAN SOMEONE TELL ME WHAT THAT  
STANDS FOR?

222

00:09:13,339 --> 00:09:14,339

IT DOESN'T WORK.

223

00:09:14,339 --> 00:09:22,250

IT DOESN'T HAVE A CONNECTION TO  
SPACE.

224

00:09:22,250 --> 00:09:24,520

>> COMMERCIAL ORBITAL TRANSPORT

SYSTEM?

225

00:09:24,520 --> 00:09:25,670

>> OKAY.

226

00:09:25,670 --> 00:09:27,550

THAT'S EXACTLY RIGHT.

227

00:09:27,550 --> 00:09:28,550

THANK YOU.

228

00:09:28,550 --> 00:09:30,870

THEY'RE GOING TO GET A LITTLE  
TRICKIER.

229

00:09:30,870 --> 00:09:34,230

SO SPACE X, THEY LAUNCHED A  
SECRET PAYLOAD.

230

00:09:34,230 --> 00:09:36,490

A SECRET PAYLOAD.

231

00:09:36,490 --> 00:09:42,250

DOES ANYONE KNOW WHAT THAT  
SECRET PAYLOAD WAS?

232

00:09:42,250 --> 00:09:46,310

NOT YOU.

233

00:09:46,310 --> 00:09:48,330

>> CHEESE?

234

00:09:48,330 --> 00:09:51,320

>> IT WAS CHEESE.

235

00:09:51,320 --> 00:09:54,500

THE QUESTIONS GET A LITTLE  
TRICKIER.

236

00:09:54,500 --> 00:09:56,970

WHAT -- THERE WAS A MASCOT FOR  
ONE OF OUR MISSIONS.

237

00:09:56,970 --> 00:09:58,120

IT'S A RUBBER CHICKEN.

238

00:09:58,120 --> 00:10:00,620

DOES ANYONE KNOW WHAT THE  
MISSION IS?

239

00:10:00,620 --> 00:10:05,940

AND WHAT THE MASCOT'S NAME IS?

240

00:10:05,940 --> 00:10:12,200

>> THE SOLAR DYNAMIC OBSERVATORY  
AND THE MASCOT IS CAMILLA!

241

00:10:12,200 --> 00:10:15,520

>> CAMILLA!

242

00:10:15,520 --> 00:10:20,630

CAMILLA'S BEEN TO ALMOST SPACE,  
I THINK.

243

00:10:20,630 --> 00:10:22,330

WENT UP ON A BALLOON RECENTLY.

244

00:10:22,330 --> 00:10:25,950

ON JUNE 5th THERE'S GOING TO BE  
A CELESTIAL EVENT HAPPENING THAT

245

00:10:25,950 --> 00:10:27,100

YOU CAN SEE AROUND THE GLOBE.

246

00:10:27,100 --> 00:10:29,190

CAN ANYONE TELL ME WHAT THAT  
EVENT IS GOING TO BE?

247

00:10:29,190 --> 00:10:32,600

I SEE THE SAME HANDS GOING UP.

248

00:10:32,600 --> 00:10:35,180

>> THE TRANSIT OF VENUS?

249

00:10:35,180 --> 00:10:36,900

>> TRANSIT OF VENUS.

250

00:10:36,900 --> 00:10:37,900

YES.

251

00:10:37,900 --> 00:10:39,580

AT AMES RESEARCH, I'VE GOT TO  
PUT IN A PLUG HERE, WE HAVE THE

252

00:10:39,580 --> 00:10:44,420

KEPLER MISSION DETECTS PLANETS  
AND STARS.

253

00:10:44,420 --> 00:10:46,660

SO THAT'S KIND OF A COOL LITTLE  
FACTOID, THOSE WHO DIDN'T KNOW

254

00:10:46,660 --> 00:10:48,450

IT.

255

00:10:48,450 --> 00:10:54,690

CAN ANYONE NAME THE ASTRONAUT  
THAT WALLOWITZ ON "THE BIG BANG

256

00:10:54,690 --> 00:11:02,200

THEORY" WAS FLYING TO THE SPACE  
STATION WITH?

257

00:11:02,200 --> 00:11:04,580

>> THAT WAS ASTRO MIKE, MIKE  
MASSAMINO.

258

00:11:04,580 --> 00:11:07,010

>> THAT'S RIGHT.

259

00:11:07,010 --> 00:11:09,470

AND I HAVE ONE LAST QUESTION FOR  
YOU BEFORE I TURN IT OVER TO OUR

260

00:11:09,470 --> 00:11:10,529

FIRST SPEAKER.

261

00:11:10,529 --> 00:11:14,550

CAN SOMEONE HERE TELL ME ALL TEN  
NASA FIELD CENTERS?

262

00:11:14,550 --> 00:11:17,060

NAME ALL TEN NASA FIELD CENTERS.

263

00:11:17,060 --> 00:11:22,890

>> I HOPE I DON'T BUNGLE THIS.

264

00:11:22,890 --> 00:11:26,730

WE'LL DO IT GEOGRAPHICALLY.

265

00:11:26,730 --> 00:11:33,470

KENNEDY, HOUSTON, AMES, JPL,  
DOES DRYDEN COUNT?

266

00:11:33,470 --> 00:11:34,470

>> YES.

267

00:11:34,470 --> 00:11:37,310

>> DRYDEN, GLENN, STODDARD.

268

00:11:37,310 --> 00:11:40,660

OOH, I'M MISSING SOME.

269

00:11:40,660 --> 00:11:43,170

OH, YEAH, STENNIS.

270

00:11:43,170 --> 00:11:44,420  
AND LANGLEY.

271

00:11:44,420 --> 00:11:47,880  
>> I THINK YOU MISSED ONE.

272

00:11:47,880 --> 00:11:49,320  
IS THAT RIGHT?

273

00:11:49,320 --> 00:11:50,759  
DID SHE MISS ONE?

274

00:11:50,759 --> 00:11:51,759  
>> WALLACE.

275

00:11:51,759 --> 00:11:52,759  
>> NO.

276

00:11:52,759 --> 00:11:53,759  
>> OH, YEAH.

277

00:11:53,759 --> 00:11:58,430  
GIVE ME A HINT.

278

00:11:58,430 --> 00:11:59,630  
>> THEY BUILD ROCKETS THERE.

279

00:11:59,630 --> 00:12:01,029  
THEY BUILD ROCKETS THERE.

280

00:12:01,029 --> 00:12:02,920  
>> HUNTSVILLE, OF COURSE.

281

00:12:02,920 --> 00:12:03,920  
MARSHALL SPACE FLIGHT.

282

00:12:03,920 --> 00:12:05,420  
>> EXACTLY RIGHT, THANK YOU.

283

00:12:05,420 --> 00:12:07,980  
THAT IS OUR UBER SPACE GEEK  
RIGHT THERE.

284

00:12:07,980 --> 00:12:12,390  
[ APPLAUSE ]  
THIS IS VERY IMPRESSIVE.

285

00:12:12,390 --> 00:12:13,959  
I HAVE TROUBLE WITH IT  
SOMETIMES.

286

00:12:13,959 --> 00:12:15,899  
SO LET ME INTRODUCE OUR FIRST  
SPEAKER TODAY.

287

00:12:15,899 --> 00:12:20,261  
WE'RE REALLY HONORED TO HAVE  
GWEN SHOTWELL WITH SPACE X.

288

00:12:20,261 --> 00:12:21,519  
SHE'S THE PRESIDENT OF SPACE X.

289

00:12:21,519 --> 00:12:26,450  
THANK YOU FOR JOINING US, GWEN.

290

00:12:26,450 --> 00:12:31,880  
>> SO YOU HAVE TO GO EASY ON ME.

291

00:12:31,880 --> 00:12:34,350  
I'M A SOCIAL VIRGIN.

292

00:12:34,350 --> 00:12:38,920  
MEANING I'VE NEVER DONE THIS  
BEFORE.

293

00:12:38,920 --> 00:12:42,040  
SO I DEFINITELY PREFER  
INTERACTION RATHER THAN ME JUST

294

00:12:42,040 --> 00:12:45,320  
BLABBING AWAY, BUT APPARENTLY I  
WAS TOLD TO BLAB AWAY FOR A

295

00:12:45,320 --> 00:12:47,899  
LITTLE BIT, SO I'LL DO THAT.

296

00:12:47,899 --> 00:12:49,240  
SO FLIGHT 4:55 A.M.

297

00:12:49,240 --> 00:12:50,240  
TOMORROW  
MORNING.

298

00:12:50,240 --> 00:12:51,610  
HOPEFULLY, KNOCK ON WOOD.

299

00:12:51,610 --> 00:12:58,330  
IF SUCCESSFUL, IT WILL BE REALLY  
HISTORIC, A COMPANY TAKING A

300

00:12:58,330 --> 00:12:59,949  
SPACE RAFT TO THE INTERNATIONAL  
SPACE STATION.

301

00:12:59,949 --> 00:13:04,610  
ONLY A FEW NATIONS HAVE DONE IT,  
OR UNIONS.

302

00:13:04,610 --> 00:13:08,339  
EUROPEAN UNION, RUSSIA, JAPAN  
AND, OF COURSE, THE UNITED

303

00:13:08,339 --> 00:13:09,339  
STATES.

304

00:13:09,339 --> 00:13:14,120

SO WE'RE KIND OF ODD TO BE IN  
THAT COMPANY.

305

00:13:14,120 --> 00:13:15,769

WE ARE CARRYING CARGO WHICH IS  
GREAT.

306

00:13:15,769 --> 00:13:16,769

WE WEREN'T ORIGINALLY GOING TO.

307

00:13:16,769 --> 00:13:19,410

WE SAID, COME ON, WE'RE GOING TO  
BE THERE.

308

00:13:19,410 --> 00:13:20,850

LET US CARRY SOME STUFF.

309

00:13:20,850 --> 00:13:24,089

LUCKILY, WE DIDN'T PUT ANYTHING  
IN THAT ROTS BECAUSE WE'VE

310

00:13:24,089 --> 00:13:28,449

BEEN -- WE'VE BEEN WAITING.

311

00:13:28,449 --> 00:13:31,730

SO I DON'T BELIEVE THERE'S ANY  
SURPRISE PAYLOADS THIS TIME.

312

00:13:31,730 --> 00:13:33,740

BUT THERE WILL BE NEXT TIME FOR  
SURE.

313

00:13:33,740 --> 00:13:34,740

AND I COULD BE WRONG.

314

00:13:34,740 --> 00:13:36,139

IT'S NOT LIKE THE PRESIDENT  
KNOWS EVERYTHING.

315

00:13:36,139 --> 00:13:38,970

MAYBE THERE IS A SECRET PAYLOAD  
ON BOARD.

316

00:13:38,970 --> 00:13:42,190

THEN I'LL BE SURPRISED, TOO.

317

00:13:42,190 --> 00:13:44,459

SO ACTUALLY, THAT'S WHAT I HAVE  
TO SAY.

318

00:13:44,459 --> 00:13:47,290

I MEAN, I'VE GOT A GAZILLION  
THINGS TO SAY, BUT I'D RATHER

319

00:13:47,290 --> 00:13:49,529

HAVE YOU GUYS TELL ME WHAT YOU  
WANT TO HEAR.

320

00:13:49,529 --> 00:13:51,740

SO HOW DO WE DO THIS?

321

00:13:51,740 --> 00:13:52,740

YOU.

322

00:13:52,740 --> 00:13:55,369

>> WAIT FOR THE MIKE.

323

00:13:55,369 --> 00:13:56,369

>> OH.

324

00:13:56,369 --> 00:14:01,050

>> IF THIS GOES WELL, WHEN DO  
YOU PLAN ON SENDING HUMANS UP?

325

00:14:01,050 --> 00:14:02,160

>> WE WOULD -- TOMORROW.

326

00:14:02,160 --> 00:14:03,160

NO.

327

00:14:03,160 --> 00:14:09,870

SO WE'RE RIGHT IN THE MIDDLE OF  
A PROCUREMENT FOR A CREW.

328

00:14:09,870 --> 00:14:11,260

COMMERCIAL CREW PROGRAM.

329

00:14:11,260 --> 00:14:14,650

IF WE WERE TO WIN, WE SHOULD  
START DOING CRUDE TEST FLIGHTS

330

00:14:14,650 --> 00:14:16,889

IN TWO YEARS.

331

00:14:16,889 --> 00:14:17,889

>> QUESTION?

332

00:14:17,889 --> 00:14:22,130

>> COME ON, YOU GUYS AREN'T SHY.

333

00:14:22,130 --> 00:14:27,260

I KNOW YOU'RE NOT SHY.

334

00:14:27,260 --> 00:14:30,660

>> RECENTLY MUSGRAVE HAD SOME  
LESS THAN FLATTERING REMARKS

335

00:14:30,660 --> 00:14:32,839

ABOUT THE LACK OF DIRECTION OF  
NASA.

336

00:14:32,839 --> 00:14:36,120

AND UNFORTUNATELY, HE ALSO  
INCLUDED SPACE X.

337

00:14:36,120 --> 00:14:38,649

I WAS WONDERING IF YOU HAD  
ANY -- IF YOU HAD SEEN THOSE

338

00:14:38,649 --> 00:14:40,970

COMMENTS OR HAD ANY RESPONSE TO  
THEM.

339

00:14:40,970 --> 00:14:43,120

>> YOU KNOW, I'VE SEEN A LOT OF  
NEGATIVE COMMENTS.

340

00:14:43,120 --> 00:14:47,340

I'VE SEEN A LOT OF POSITIVE  
COMMENTS.

341

00:14:47,340 --> 00:14:50,130

I THINK WHAT SPACE X AND NASA  
ARE DOING IN PARTNERSHIP IS

342

00:14:50,130 --> 00:14:51,850

NOTHING SHORT OF EXTRAORDINARY.

343

00:14:51,850 --> 00:14:55,120

SO I HAVE ABSOLUTELY NO  
COMPLAINTS ABOUT NASA.

344

00:14:55,120 --> 00:14:58,470

FRANKLY, I THINK SOME OF THE  
FOLKS THAT ARE REALLY CRITICAL

345

00:14:58,470 --> 00:15:03,830

OF WHAT WE'RE DOING TOGETHER IS  
SOUR GRAPES.

346

00:15:03,830 --> 00:15:06,579

THAT THEY'RE NOT DOING THESE  
COOL THINGS, TOO, NOW.

347

00:15:06,579 --> 00:15:10,079

I'D RATHER REALLY FOCUS ON --  
THERE ARE PEOPLE THAT ARE ALWAYS

348

00:15:10,079 --> 00:15:12,791  
GOING TO DESPISE WHAT WE'RE  
DOING AND I DON'T FOCUS ON THAT.

349

00:15:12,791 --> 00:15:16,709  
IT'S A SHAME THAT IT COMES UP,  
ESPECIALLY WHEN NATIONAL HEROES

350

00:15:16,709 --> 00:15:18,000  
DO IT.

351

00:15:18,000 --> 00:15:22,550  
BUT I THINK IF THESE FOLKS CAME  
TO SPACE X AND GOT TO KNOW US

352

00:15:22,550 --> 00:15:27,680  
AND SAW THE ALMOST 1900 PEOPLE  
WORKING THERE AND SEEING HOW

353

00:15:27,680 --> 00:15:29,980  
HARD THEY WORK AND WHAT WE'RE  
TRYING TO DO, THEY'D CHANGE

354

00:15:29,980 --> 00:15:32,579  
THEIR OPINION.

355

00:15:32,579 --> 00:15:37,459  
>> THANK YOU.

356

00:15:37,459 --> 00:15:38,980  
I THINK THE HISTORY IS REALLY  
COOL HERE.

357

00:15:38,980 --> 00:15:43,029  
I HAVE A BOOK WITH A 1946  
PHOTOGRAPH OF JACK NORTHROP'S

358

00:15:43,029 --> 00:15:45,269

HAWTHORNE COMPLEX.

359

00:15:45,269 --> 00:15:48,519

CAN YOU TELL US ALL A LITTLE BIT  
OF THE HISTORY OF HOW YOU ENDED

360

00:15:48,519 --> 00:15:53,529

UP THERE, HOW ROADS WERE RENAMED  
AND HOW NORTHROP AND ALL THESE

361

00:15:53,529 --> 00:15:56,920

KIND OF CRAZY PIONEERS DO THIS  
IN THE SAME PLACE AND IN THE

362

00:15:56,920 --> 00:15:57,920

SAME WAY?

363

00:15:57,920 --> 00:16:02,529

>> YOU KNOW, THAT BUILDING IS AN  
EXTRAORDINARY BUILDING.

364

00:16:02,529 --> 00:16:06,029

WHEN WE FIRST -- WHEN IT FIRST  
CAME UP FOR LEASE, WE WANTED IT

365

00:16:06,029 --> 00:16:07,569

BUT COULDN'T AFFORD IT.

366

00:16:07,569 --> 00:16:10,509

IT WAS ABOUT A YEAR BEFORE WE  
GOT THE C.O.T.S.

367

00:16:10,509 --> 00:16:13,579

AWARD IN 2006.

368

00:16:13,579 --> 00:16:17,670

WE WERE REALLY BUSTING OUT OF  
OUR FACILITIES, OUR MULTIPLE

369

00:16:17,670 --> 00:16:21,279  
FACILITIES IN EL SEGUNDO,  
CALIFORNIA.

370

00:16:21,279 --> 00:16:25,170  
WE WANTED IT BUT IT WAS TOO  
EXPENSIVE AT THE TIME.

371

00:16:25,170 --> 00:16:27,330  
THEN WE WON THE C.O.T.S.

372

00:16:27,330 --> 00:16:28,330  
PROGRAM.

373

00:16:28,330 --> 00:16:32,329  
GAVE US KIND OF ENOUGH WILL  
POWER TO TRY TO GET IT.

374

00:16:32,329 --> 00:16:35,580  
A MOTOR HOME COMPANY BOUGHT IT.

375

00:16:35,580 --> 00:16:38,259  
LIKE SIX WEEKS BEFORE WE COULD  
HAVE GOTTEN IT.

376

00:16:38,259 --> 00:16:41,569  
BY THE WAY, THIS IS THE RECENT  
HISTORY OF THAT BUILDING.

377

00:16:41,569 --> 00:16:43,779  
THERE'S SOME REAL HISTORY  
ASSOCIATED WITH WHAT WAS GOING

378

00:16:43,779 --> 00:16:45,199  
ON IN THAT FACILITY.

379

00:16:45,199 --> 00:16:47,340  
AND RIGHT BEFORE WE WERE

INTERESTED IN GETTING IT, THEY

380

00:16:47,340 --> 00:16:49,440

WERE BUILDING 747 AIR FRAMES  
THERE.

381

00:16:49,440 --> 00:16:54,000

NOW THE FACILITY HAS SHRUNK AND  
THEY'VE MOVED THAT FACILITY

382

00:16:54,000 --> 00:16:57,350

FURTHER WEST IN THAT SAME  
COMPLEX.

383

00:16:57,350 --> 00:16:58,350

WE WANTED THAT BUILDING.

384

00:16:58,350 --> 00:17:01,240

WE LOST IT AND THEN WE HARASSED  
THESE GUYS MERCILESSLY TO LET US

385

00:17:01,240 --> 00:17:03,529

LEASE IT FROM THEM.

386

00:17:03,529 --> 00:17:06,410

WE'VE BEEN POURING MILLIONS AND  
MILLIONS INTO IT EVER SINCE.

387

00:17:06,410 --> 00:17:09,860

IF YOU GUYS ARE EVER IN THE L.A.  
AREA, LOVE TO GIVE YOU GUYS A

388

00:17:09,860 --> 00:17:10,860

TOUR.

389

00:17:10,860 --> 00:17:11,860

IT'S A REMARKABLE BUILDING.

390

00:17:11,860 --> 00:17:13,460

IS THAT ENOUGH?

391

00:17:13,460 --> 00:17:16,130

YOU WANT MORE?

392

00:17:16,130 --> 00:17:17,910

TOO MUCH?

393

00:17:17,910 --> 00:17:18,910

OKAY.

394

00:17:18,910 --> 00:17:21,950

>> I WANTED TO ASK YOU ABOUT  
COSTS FOR COMMERCIAL SPACE

395

00:17:21,950 --> 00:17:25,460

TRAVEL AND HOW -- YOU WORK WITH  
THE COMPANIES THAT YOU'RE

396

00:17:25,460 --> 00:17:29,250

COMPETING AGAINST TO DO  
EFFECTIVE SPACE TRAVEL

397

00:17:29,250 --> 00:17:34,050

COMMERCIALLY.

398

00:17:34,050 --> 00:17:35,850

>> SO WHAT WAS THE QUESTION?

399

00:17:35,850 --> 00:17:40,150

>> BASICALLY, THERE ARE FOUR  
COMPANIES, FIVE COMPANIES WHO

400

00:17:40,150 --> 00:17:42,510

ARE EFFECTIVELY COMPETING FOR  
THESE CONTRACTS.

401

00:17:42,510 --> 00:17:43,510

>> YES.

402

00:17:43,510 --> 00:17:44,890

>> AND THIS IS SUPPOSED TO BE  
MORE COST EFFECTIVE.

403

00:17:44,890 --> 00:17:48,450

AND I'M WONDERING HOW FOR BOTH  
NASA AND FOR THE COMPANIES THAT

404

00:17:48,450 --> 00:17:52,590

YOU'RE PARTNERING WITH BUT YET  
COMPETING AGAINST, HOW THIS

405

00:17:52,590 --> 00:17:55,690

WORKS COMMERCIALLY AND HOW IT  
WORKS IN A COST-EFFECTIVE

406

00:17:55,690 --> 00:17:56,690

MANNER.

407

00:17:56,690 --> 00:17:57,690

>> WELL, WE'RE PARTNERING WITH  
NASA.

408

00:17:57,690 --> 00:18:04,420

WE ARE NOT PARTNERING WITH BLUE  
AND BOEING AND SIERRA NEVADA.

409

00:18:04,420 --> 00:18:09,930

DID I MISS ONE?

410

00:18:09,930 --> 00:18:11,120

SO WE'RE NOT PARTNERING WITH  
THEM.

411

00:18:11,120 --> 00:18:14,070

WE'RE IN PARTNERSHIP WITH NASA.

412

00:18:14,070 --> 00:18:18,800

I DO LOVE THE WAY THIS PROGRAM  
HAS EVOLVED, BOTH THE C.O.T.S.,

413

00:18:18,800 --> 00:18:22,810  
CARGO CAPABILITY AS WELL AS THE  
CREW CAPABILITY.

414

00:18:22,810 --> 00:18:25,931  
WE'RE JUST FINISHING UP OUR --  
THE SECOND INCREMENT OF THE CREW

415

00:18:25,931 --> 00:18:27,060  
PIECE.

416

00:18:27,060 --> 00:18:32,830  
WE WERE NOT ONE OF THE CC DEV 1  
WINNERS.

417

00:18:32,830 --> 00:18:36,690  
WE'RE PUTTING A CONCEPT TOGETHER  
FOR ALL THE CREW.

418

00:18:36,690 --> 00:18:38,780  
WE'VE MADE REALLY GREAT  
PROGRESS.

419

00:18:38,780 --> 00:18:43,430  
THE INSIDE OF DRAGON IS PRETTY  
COOL WITH SEVEN FOLKS IN IT, AND

420

00:18:43,430 --> 00:18:45,450  
PRIMARILY FOCUS ON THE LAUNCH  
ESCAPE SYSTEM.

421

00:18:45,450 --> 00:18:50,260  
AND WHAT WE DECIDED DURING THIS  
PROCESS WAS WE'D INTEGRATE THOSE

422

00:18:50,260 --> 00:18:53,400  
ESCAPE ENGINES INTO THE CAPSULE,

MAKES SO MUCH MORE SENSE.

423

00:18:53,400 --> 00:18:56,550

YOU DON'T HAVE TO DEPLOY THAT  
TRACTOR TOWER WHICH IS A

424

00:18:56,550 --> 00:18:57,550

CRITICAL EVENT.

425

00:18:57,550 --> 00:18:58,670

YOU CAN'T COME BACK WITH IT.

426

00:18:58,670 --> 00:19:01,790

SO WE REALLY FEEL LIKE OUR  
DESIGN IS INCREDIBLY SAFE.

427

00:19:01,790 --> 00:19:03,120

WE HAVE AVOIDED SOME OF THE  
PITFALLS.

428

00:19:03,120 --> 00:19:05,580

WE'VE BEEN ABLE TO LEARN THAT'S  
REALLY THE BENEFIT OF DOING

429

00:19:05,580 --> 00:19:09,240

SPACE MISSIONS NOW IS YOU HAVE  
THE BENEFIT OF LEARNING FROM 40,

430

00:19:09,240 --> 00:19:11,480

50 YEARS OF DEVELOPMENT.

431

00:19:11,480 --> 00:19:14,050

IT'S WHY WE CAN DO WHAT WE'RE  
DOING.

432

00:19:14,050 --> 00:19:18,910

AND COST EFFECTIVE, EVERY TIME  
PEOPLE ASK ME WHY AM I SO CHEAP,

433

00:19:18,910 --> 00:19:20,720  
I ALWAYS ASK, WHY ARE YOU SO  
EXPENSIVE?

434  
00:19:20,720 --> 00:19:30,110  
>> DO YOU FIND IT MORE COST  
EFFECTIVE?

435  
00:19:30,110 --> 00:19:32,140  
>> THIS IS THE ONLY ENVIRONMENT  
WE'VE EVER DONE DEVELOPMENT IN

436  
00:19:32,140 --> 00:19:33,140  
AT SPACE X.

437  
00:19:33,140 --> 00:19:36,840  
I DID SPEND TEN YEARS AT  
AEROSPACE CORPORATION.

438  
00:19:36,840 --> 00:19:38,890  
COST EFFECTIVE IS NOT PART OF  
THEIR MANTRA.

439  
00:19:38,890 --> 00:19:40,450  
IT'S MUST WORK ALL THE TIME.

440  
00:19:40,450 --> 00:19:41,840  
THESE ARE NATIONAL SECURITY  
ASSETS.

441  
00:19:41,840 --> 00:19:44,070  
YOU DON'T GET A SECOND CHANCE ON  
IT.

442  
00:19:44,070 --> 00:19:48,100  
BUT, YOU KNOW, TAKING RISKS IN  
THE DEVELOPMENT SIDE, THAT

443  
00:19:48,100 --> 00:19:50,020  
DOESN'T MEAN CUTTING CORNERS.

444

00:19:50,020 --> 00:19:53,560

BUT TAKING RISKS AND GOING AND  
TESTING AND LEARNING FROM

445

00:19:53,560 --> 00:19:55,410

TESTING IS THE BEST WAY, I  
THINK.

446

00:19:55,410 --> 00:19:58,280

SO RAPID PROTOTYPE, GET THE TEST  
AS FAST AS YOU CAN.

447

00:19:58,280 --> 00:20:00,480

YOU MAKE MISTAKES ON THE TEST  
BUT THAT'S WHAT YOU'RE SUPPOSED

448

00:20:00,480 --> 00:20:01,480

TO DO.

449

00:20:01,480 --> 00:20:03,540

MEANTIME, YOUR ENGINEERS ARE  
DESIGNING AND TESTING AND

450

00:20:03,540 --> 00:20:06,850

BLOWING STUFF UP AND LEARNING  
FROM THAT AND TESTING SOME MORE.

451

00:20:06,850 --> 00:20:08,520

AND THESE ARE THE BEST ENGINEERS  
ON THE PLANET.

452

00:20:08,520 --> 00:20:13,770

AND I'M PLEASED TO BE WORKING  
WITH THEM.

453

00:20:13,770 --> 00:20:17,820

>> SO THIS IS A QUESTION FROM  
ANOTHER UBER SPACE TWEET, B.J.

454

00:20:17,820 --> 00:20:21,830

HE WANTS TO KNOW IF SPACE X WILL  
BE HIRING THEIR OWN ASTRONAUTS?

455

00:20:21,830 --> 00:20:26,000

>> THE FIRST CRUDE FLIGHT WILL  
BE WITH SPACE X ASTRONAUTS.

456

00:20:26,000 --> 00:20:29,320

AND THAT WILL PROBABLY BE SOME  
COMBINATION OF FOLKS HIRED TO DO

457

00:20:29,320 --> 00:20:33,260

SPECIFICALLY THAT AS WELL AS  
CURRENT EMPLOYEES THAT WANT TO

458

00:20:33,260 --> 00:20:34,260

DO IT.

459

00:20:34,260 --> 00:20:37,200

I HAVE JUST A REALLY CHARMING  
STORY TO SHARE WITH YOU GUYS

460

00:20:37,200 --> 00:20:38,200

BRIEFLY.

461

00:20:38,200 --> 00:20:40,710

WHEN WE FIRST MOVED INTO THE  
HAWTHORNE FACILITY, IF WE COULD

462

00:20:40,710 --> 00:20:43,710

ALL FIT IN THE LUNCHROOM AT THAT  
TIME, CAN'T ANYMORE.

463

00:20:43,710 --> 00:20:48,430

AND ELON SAID, SO WHO WOULD --  
THERE WAS ABOUT 300 OR 400 OF

464

00:20:48,430 --> 00:20:49,430

US.

465

00:20:49,430 --> 00:20:52,160

WHO WOULD FLY ON DRAGON?

466

00:20:52,160 --> 00:20:55,120

AND ALMOST EVERYBODY STOOD UP.

467

00:20:55,120 --> 00:20:57,260

AND THEN WHO WOULD FLY ON THE  
FIRST DRAGON?

468

00:20:57,260 --> 00:21:01,320

AND MAYBE TWO CHICKENS SAT DOWN,  
RIGHT?

469

00:21:01,320 --> 00:21:04,960

BUT YOU'VE GOT ABOUT 1900 PEOPLE  
THAT WANT TO BE ON DRAGON.

470

00:21:04,960 --> 00:21:11,280

SO IT'S GOING TO BE KIND OF A  
SHOVE-OUT.

471

00:21:11,280 --> 00:21:12,610

OKAY.

472

00:21:12,610 --> 00:21:17,950

SEND ME AN E-MAIL.

473

00:21:17,950 --> 00:21:19,380

IT'S GWEN@SPACEX.COM.

474

00:21:19,380 --> 00:21:23,390

IT'S SUPER EASY.

475

00:21:23,390 --> 00:21:26,289

MORE QUESTIONS?

476

00:21:26,289 --> 00:21:29,440

>> CAN YOU TALK A BIT ABOUT A  
POSSIBLE SOUTH TEXAS FACILITY?

477

00:21:29,440 --> 00:21:32,760

WE'RE FROM TEXAS SO HAVING A  
LAUNCH FACILITY CLOSE WOULD BE

478

00:21:32,760 --> 00:21:33,760

COOL.

479

00:21:33,760 --> 00:21:38,190

AND THE PARTNERSHIP WITH BIGELOW  
AEROSPACE?

480

00:21:38,190 --> 00:21:40,210

>> WE DEFINITELY NEED A  
COMMERCIAL LAUNCH SITE.

481

00:21:40,210 --> 00:21:41,450

THERE'S NO QUESTION ABOUT IT.

482

00:21:41,450 --> 00:21:44,630

THE MANIFEST THAT WE HAVE  
LOOKING FORWARD STARTING IN '14

483

00:21:44,630 --> 00:21:49,370

AND '15 WILL OVERWHELM, I THINK,  
BOTH THE CAPE HERE AS WELL AS

484

00:21:49,370 --> 00:21:52,300

VANDENBURG.

485

00:21:52,300 --> 00:21:53,860

WE REALLY WANT A COMMERCIAL  
SITE.

486

00:21:53,860 --> 00:21:56,760

WE'RE LOOKING AT FOUR OR FIVE

POSSIBILITIES HERE IN FLORIDA,

487

00:21:56,760 --> 00:22:01,770

VIRGINIA, OF COURSE, PUERTO  
RICO, HAWAII, AND SOUTH TEXAS.

488

00:22:01,770 --> 00:22:05,950

WE'RE FURTHEST ALONG WITH TEXAS.

489

00:22:05,950 --> 00:22:08,660

BUT NONE OF THEM WILL BE EASY.

490

00:22:08,660 --> 00:22:11,550

SO IT'S GOING TO TAKE -- IT'S  
GOING TO TAKE A WHILE TO FIGURE

491

00:22:11,550 --> 00:22:14,170

OUT WHICH IN THE END IS THE BEST  
CHOICE.

492

00:22:14,170 --> 00:22:17,040

BUT WE DO NEED A COMMERCIAL SITE  
FOR SURE.

493

00:22:17,040 --> 00:22:19,480

OH, AND BIGELOW, PARTNERSHIP.

494

00:22:19,480 --> 00:22:27,350

BOB BIGELOW HAS BEEN A CUSTOMER  
OF SPACE X SINCE 2006, ACTUALLY.

495

00:22:27,350 --> 00:22:29,510

WE'LL FLY A MISSION FOR HIM.

496

00:22:29,510 --> 00:22:32,570

AND HE'S ALWAYS BEEN VERY CANDID  
ABOUT NEEDING AT LEAST TWO

497

00:22:32,570 --> 00:22:35,160

PROVIDERS BOTH ON LAUNCH AS WELL  
AS CAPSULES.

498

00:22:35,160 --> 00:22:36,300  
HE'S A SMART BUSINESSMAN.

499

00:22:36,300 --> 00:22:40,050  
AND HE'S NOT PUTTING HIS EGGS IN  
ONE BASKET.

500

00:22:40,050 --> 00:22:43,470  
WE'VE KEPT THE RELATIONSHIP  
PRETTY QUIET, IN GENERAL.

501

00:22:43,470 --> 00:22:47,860  
GIVEN WHERE WE ARE, GIVEN THE  
SUCCESS OF THE DRAGON FLIGHT IN

502

00:22:47,860 --> 00:22:51,270  
DECEMBER OF '10 AND THE PROGRESS  
THAT WE'VE MADE ON THE

503

00:22:51,270 --> 00:22:54,050  
COMMERCIAL CREW, WE'VE KIND OF  
JOINTLY FELT LIKE IT WAS TIME TO

504

00:22:54,050 --> 00:22:55,930  
GO OUT AND DO SOME MARKETING.

505

00:22:55,930 --> 00:22:58,180  
GET SOME BUSINESS FOR HIM.

506

00:22:58,180 --> 00:23:01,790  
>> I HAD A QUESTION.

507

00:23:01,790 --> 00:23:05,090  
I'M REALLY EXCITED ABOUT THE  
FALCON HEAVY ALSO.

508

00:23:05,090 --> 00:23:06,280  
BECAUSE I'M FROM CALIFORNIA.

509  
00:23:06,280 --> 00:23:07,350  
AND I THINK THAT'S GOING TO GO  
OUT --

510  
00:23:07,350 --> 00:23:10,790  
>> FIRST WANT TO GO FROM VANDY.

511  
00:23:10,790 --> 00:23:11,790  
>> YEAH, VANDY.

512  
00:23:11,790 --> 00:23:15,310  
ANY UPDATES ON WHEN THAT  
POSSIBILITY IS FOR TIMING?

513  
00:23:15,310 --> 00:23:17,930  
>> WE SHOULD HAVE THE FIRST  
VEHICLE BUILT THIS YEAR OR EARLY

514  
00:23:17,930 --> 00:23:18,930  
NEXT.

515  
00:23:18,930 --> 00:23:22,340  
AND THEN WE'LL FLY IT AS SOON AS  
WE CAN GET HER OFF THE DECK,

516  
00:23:22,340 --> 00:23:23,340  
NEXT YEAR.

517  
00:23:23,340 --> 00:23:27,160  
I WOULD SAY PROBABLY MID-'13,  
MAYBE AN EXTRA QUARTER OR SO.

518  
00:23:27,160 --> 00:23:30,670  
WE'RE GOING TO FLY NEXT YEAR.

519  
00:23:30,670 --> 00:23:32,590

YOU KNOW, I THINK YOU COULD  
PROBABLY SEE THAT VEHICLE FLY

520  
00:23:32,590 --> 00:23:34,610  
FROM HERE.

521  
00:23:34,610 --> 00:23:35,850  
IT'S A GIGANTIC VEHICLE.

522  
00:23:35,850 --> 00:23:40,880  
IT WOULD BE SO GREAT.

523  
00:23:40,880 --> 00:23:44,010  
>> WITH THE LAUNCH THAT'S COMING  
UP TOMORROW, HOW EXTENSIVE WERE

524  
00:23:44,010 --> 00:23:49,970  
THE MODIFICATIONS ON THE LANDING  
PADS FOR THE FALCON 9 ROCKET

525  
00:23:49,970 --> 00:23:50,970  
THAT'S GOING OFF?

526  
00:23:50,970 --> 00:23:52,290  
DID YOU HAVE TO CHANGE IT MUCH?

527  
00:23:52,290 --> 00:23:54,930  
>> WELL, THERE WERE NO CHANGES  
TO FALCON 9.

528  
00:23:54,930 --> 00:23:56,090  
NOT ANYTHING SUBSTANTIAL.

529  
00:23:56,090 --> 00:24:00,530  
WE ALWAYS TRY TO UPGRADE THINGS  
AS WE GO.

530  
00:24:00,530 --> 00:24:02,320  
THE LAUNCH PAD WAS ALREADY HERE.

531

00:24:02,320 --> 00:24:05,690

>> DID YOU HAVE TO CHANGE THAT  
TO -- TO FIT OR ACCOMMODATE THE

532

00:24:05,690 --> 00:24:06,990

ROCKET?

533

00:24:06,990 --> 00:24:08,300

SPECIFICALLY?

534

00:24:08,300 --> 00:24:10,620

>> FOR THIS FLIGHT, WE DIDN'T  
HAVE ANY SUBSTANTIAL

535

00:24:10,620 --> 00:24:11,620

ACCOMMODATIONS.

536

00:24:11,620 --> 00:24:13,572

WE ARE BUILDING SOME ADDITIONAL  
CAPABILITY OF THE PAD.

537

00:24:13,572 --> 00:24:16,450

SO IF YOU SEE CONSTRUCTION OUT  
THERE, IT WASN'T TO FACILITATE,

538

00:24:16,450 --> 00:24:19,880

IT WAS JUST TO UPGRADE THE PAD  
GENERALLY.

539

00:24:19,880 --> 00:24:22,460

BUT THERE WERE EXTENSIVE  
UPGRADES TO DRAGON.

540

00:24:22,460 --> 00:24:24,060

THIS DRAGON IS CAPABLE OF  
BIRTHING.

541

00:24:24,060 --> 00:24:25,160

THE LAST WAS NOT.

542

00:24:25,160 --> 00:24:28,710  
IT'S NOT THE COMMON BIRTHING  
MECHANISM, THE PROXIMITY

543

00:24:28,710 --> 00:24:31,960  
OPERATIONS SENSORS AND  
CAPABILITY ON BOARD.

544

00:24:31,960 --> 00:24:33,000  
IT'S GOT STAR TRACKERS.

545

00:24:33,000 --> 00:24:35,900  
MUCH MORE SOPHISTICATED  
SPACECRAFT.

546

00:24:35,900 --> 00:24:41,920  
I BELIEVE ALL THE SAME COMS ARE  
THERE.

547

00:24:41,920 --> 00:24:47,080  
I THINK WE'RE FLYING A NEW  
FLIGHT COMPUTER, KURDISH RITE.

548

00:24:47,080 --> 00:24:49,560  
SO EXTENSIVE UPGRADE.

549

00:24:49,560 --> 00:24:51,430  
IT'S GOT SOLAR GENERATION  
CAPABILITY.

550

00:24:51,430 --> 00:24:56,650  
ONE OF THE FIRST THINGS WE DO  
WHEN WE SEPARATE, 9:49 INTO THE

551

00:24:56,650 --> 00:25:00,210  
FLIGHT TOMORROW, WE SHOULD  
DEPLOY THE SOLAR RAYS.

552

00:25:00,210 --> 00:25:02,330

>> HELLO.

553

00:25:02,330 --> 00:25:04,450

>> HEY.

554

00:25:04,450 --> 00:25:07,700

>> I'M A TEACHER.

555

00:25:07,700 --> 00:25:09,450

AND THERE ARE STUDENTS WATCHING.

556

00:25:09,450 --> 00:25:12,950

SO I JUST WONDERED IF YOU'D LIKE  
TO MAKE A COMMENT TO CHILDREN

557

00:25:12,950 --> 00:25:16,990

AND, YOU KNOW, THE FUTURE OF  
SPACE AND COMMERCIAL DEVELOPMENT

558

00:25:16,990 --> 00:25:17,990

OF SPACE.

559

00:25:17,990 --> 00:25:20,360

>> WELL, DEFINITELY STAY EXCITED  
ABOUT SPACE.

560

00:25:20,360 --> 00:25:22,770

SPACE IS GOING TO BE A REALLY --  
IT HAS BEEN COOL.

561

00:25:22,770 --> 00:25:27,090

IT GOT A LITTLE BORING.

562

00:25:27,090 --> 00:25:31,340

AND NOW I THINK IT'S STARTING TO  
GAIN TRACTION AGAIN.

563

00:25:31,340 --> 00:25:36,380  
I THINK ANYTIME YOU CAN ACCESS  
SOMETHING LIKE SPACE MORE

564  
00:25:36,380 --> 00:25:38,760  
BROADLY, IT BECOMES FAR MORE  
APPEALING.

565  
00:25:38,760 --> 00:25:41,430  
AND WE'RE AT THE DAWN OF A NEW  
AGE HERE IN SPACE.

566  
00:25:41,430 --> 00:25:45,290  
AND SO I HOPE -- I MEAN, MY KIDS  
LOVE SPACE AND DINOSAURS, RIGHT?

567  
00:25:45,290 --> 00:25:47,320  
I THINK ALL KIDS LOVE SPACE AND  
DINOSAURS.

568  
00:25:47,320 --> 00:25:49,330  
DINOSAURS ARE HARD.

569  
00:25:49,330 --> 00:25:51,500  
SPACE, WE'RE HERE TO DO THAT.

570  
00:25:51,500 --> 00:25:56,390  
>> COULD YOU MENTION SOME OF THE  
CAREERS THAT STUDENTS MIGHT BE

571  
00:25:56,390 --> 00:25:57,480  
ABLE TO GO INTO?

572  
00:25:57,480 --> 00:25:59,120  
BECAUSE THEY KNOW ABOUT BEING AN  
ASTRONAUT.

573  
00:25:59,120 --> 00:26:00,120  
THEY SEE THAT.

574

00:26:00,120 --> 00:26:01,120

AND THEY ALL WANT TO BE AN  
ASTRONAUT.

575

00:26:01,120 --> 00:26:02,950

BUT NOT EVERYBODY WILL BE AN  
ASTRONAUT.

576

00:26:02,950 --> 00:26:03,950

>> YEAH.

577

00:26:03,950 --> 00:26:05,010

WELL, I'M AN ENGINEER.

578

00:26:05,010 --> 00:26:07,400

SO I ALWAYS PROMOTE THE  
ENGINEERING PIECE.

579

00:26:07,400 --> 00:26:11,700

I THINK THAT'S ONE OF THE  
COOLEST CAREERS ON THE PLANET.

580

00:26:11,700 --> 00:26:16,140

AN ENGINEER GETS TO DEFINE HOW  
SOMETHING WORKS AND CREATE

581

00:26:16,140 --> 00:26:17,140

THINGS.

582

00:26:17,140 --> 00:26:19,530

SO I'M TRYING TO GET MY DAUGHTER  
TO BE AN ENGINEER.

583

00:26:19,530 --> 00:26:21,700

I THINK SHE'S GOING FOR IT,  
WHICH IS AMAZING.

584

00:26:21,700 --> 00:26:23,810

BECAUSE SHE STARTED OUT, SHE

WANTED TO BE A TEACHER.

585

00:26:23,810 --> 00:26:28,260

THEN SHE WANTED TO BE A LAWYER.

586

00:26:28,260 --> 00:26:30,510

AND NOW I THINK SHE'S GOING TO  
BE AN ENGINEER.

587

00:26:30,510 --> 00:26:31,550

WHICH IS AWESOME.

588

00:26:31,550 --> 00:26:34,210

SO I'D PROMOTE ENGINEERING, A  
TECHNOLOGY DEGREE.

589

00:26:34,210 --> 00:26:36,780

EVEN IF YOU DON'T WANT TO BE AN  
ENGINEER, IT'S A GREAT

590

00:26:36,780 --> 00:26:37,850

EDUCATIONAL FOUNDATION.

591

00:26:37,850 --> 00:26:41,600

IT TEACHES YOU HOW TO SOLVE  
PROBLEMS.

592

00:26:41,600 --> 00:26:42,990

AND CREATE THINGS.

593

00:26:42,990 --> 00:26:45,840

>> YOU ARE A FEMALE ENGINEER,  
AND THAT'S -- YEA!

594

00:26:47,840 --> 00:26:46,840

YEA!

595

00:26:47,840 --> 00:26:48,840

>> WHOO!

596

00:26:48,840 --> 00:26:56,290

[ CHEERS AND APPLAUSE ]

AND SOME GIRLS DON'T SEE THAT

597

00:26:56,290 --> 00:26:59,570

AS, YOU KNOW, A WAY FOR THEM

BECAUSE THEY LOOK AT SCHOOLS AND

598

00:26:59,570 --> 00:27:01,070

SEE THERE ARE MANY GENTLEMEN

THERE.

599

00:27:01,070 --> 00:27:03,710

>> NO, THAT'S A GOOD THING,

RIGHT?

600

00:27:03,710 --> 00:27:04,800

THAT IS A GOOD THING.

601

00:27:04,800 --> 00:27:07,400

>> GO TO SCHOOL WHERE THERE ARE

BOYS.

602

00:27:07,400 --> 00:27:08,650

WE LOVE OUR MEN.

603

00:27:08,650 --> 00:27:11,660

BUT FOR THE GIRLS OUT THERE,

WHAT WORDS OF ADVICE ABOUT GOING

604

00:27:11,660 --> 00:27:15,280

INTO A FIELD THAT IS DOMINATED

BY MEN?

605

00:27:15,280 --> 00:27:19,660

>> WELL, YOU KNOW, I DIDN'T

THINK I'D BE AN ENGINEER EITHER.

606

00:27:19,660 --> 00:27:21,160  
I WAS A CHEERLEADER IN HIGH  
SCHOOL.

607  
00:27:21,160 --> 00:27:24,850  
AND MY MOM WHO'S AN ARTIST SAID,  
WELL, YOU SHOULD BE AN ENGINEER.

608  
00:27:24,850 --> 00:27:26,370  
WHAT?

609  
00:27:26,370 --> 00:27:29,260  
AND SHE TOOK ME TO A SOCIETY OF  
WOMEN ENGINEERS EVENT.

610  
00:27:29,260 --> 00:27:32,000  
AND I LOVED THE WOMAN TALKING.

611  
00:27:32,000 --> 00:27:36,320  
SHE HAD A GREAT SUIT AND SHOES,  
SHE OWNED HER OWN COMPANY, SHE

612  
00:27:36,320 --> 00:27:37,660  
WAS SUPER INTELLIGENT.

613  
00:27:37,660 --> 00:27:41,120  
AND THAT DAY, I WAS 15, I SAID,  
OKAY, I'LL BE A MECHANICAL

614  
00:27:41,120 --> 00:27:42,120  
ENGINEER.

615  
00:27:42,120 --> 00:27:43,120  
IT WAS THAT FLAKY.

616  
00:27:43,120 --> 00:27:45,720  
THAT'S HOW I BECAME AN ENGINEER.

617  
00:27:45,720 --> 00:27:48,640

AND I WENT TO NORTHWESTERN  
UNIVERSITY WHICH DOESN'T SOUND

618

00:27:48,640 --> 00:27:51,700

LIKE MASSACHUSETTS INSTITUTE OF  
TECHNOLOGY.

619

00:27:51,700 --> 00:27:53,930

YOU'RE SCARED TO DEATH.  
15-YEAR-OLD GIRLS DON'T WANT

620

00:27:53,930 --> 00:27:56,900

TO -- I DIDN'T, AND MY FRIENDS  
DIDN'T WANT TO GO TO A PLACE

621

00:27:56,900 --> 00:27:58,780

LIKE THAT.

622

00:27:58,780 --> 00:28:03,731

SO DON'T BE -- DON'T BE SHY OR  
NERVOUS ABOUT TRYING TO GO FOR

623

00:28:03,731 --> 00:28:04,731

SOMETHING LIKE THAT.

624

00:28:04,731 --> 00:28:05,920

IT WAS REALLY RANDOM FOR ME.

625

00:28:05,920 --> 00:28:10,600

AND IT TURNED OUT TO BE A GREAT  
ACCIDENT.

626

00:28:10,600 --> 00:28:12,060

IF YOU'RE GOOD AT SOMETHING,  
PURSUE IT.

627

00:28:12,060 --> 00:28:15,090

IT DOESN'T MATTER WHAT EVERYBODY  
ELSE LOOKS LIKE, WHY YOU'RE

628

00:28:15,090 --> 00:28:19,090

DOING IT OR WHAT ANYBODY ELSE  
SAYS ABOUT IT.

629

00:28:19,090 --> 00:28:21,410

JUST DO WHAT YOU'RE GOING TO DO.

630

00:28:21,410 --> 00:28:22,410

>> THANK YOU VERY MUCH.

631

00:28:22,410 --> 00:28:26,760

>> WE HAVE TIME FOR ONE MORE  
QUESTION AFTER THIS.

632

00:28:26,760 --> 00:28:27,950

ANY MORE QUESTIONS?

633

00:28:27,950 --> 00:28:29,130

ONE MORE?

634

00:28:29,130 --> 00:28:30,290

>> OKAY.

635

00:28:30,290 --> 00:28:35,730

I REMEMBER HEARING ABOUT SPACE X  
PLANNING ON SENDING ASTRONAUTS

636

00:28:35,730 --> 00:28:37,050

TO MARS EVENTUALLY.

637

00:28:37,050 --> 00:28:40,210

I WAS WONDERING, ARE YOU GUYS  
GOING TO CONTINUE PUSHING THE

638

00:28:40,210 --> 00:28:44,760

TRADITIONAL ROCKET DESIGN, WHAT  
YOU GUYS HAVE NOW, OR TRY

639

00:28:44,760 --> 00:28:47,180  
EXPERIMENTING WITH OTHER  
PROPULSION TECHNOLOGIES AND

640  
00:28:47,180 --> 00:28:48,180  
WHATNOT?

641  
00:28:48,180 --> 00:28:49,890  
>> YOU KNOW, WE'RE LOOKING AT  
SOME OTHER PROPULSION

642  
00:28:49,890 --> 00:28:52,200  
TECHNOLOGIES.

643  
00:28:52,200 --> 00:28:54,030  
THAT'S REALLY NOT MY AREA.

644  
00:28:54,030 --> 00:28:59,450  
ELON REALLY FOCUSES ON THE  
TECHNOLOGY DRIVE.

645  
00:28:59,450 --> 00:29:02,710  
WE'RE LOOKING AT ELECTRIC  
PROPULSION, SOME DIFFERENT FUELS

646  
00:29:02,710 --> 00:29:03,860  
AS WELL.

647  
00:29:03,860 --> 00:29:09,490  
I KNOW HE WAS A LITTLE NERVOUS  
IN GENERAL ABOUT NUCLEAR

648  
00:29:09,490 --> 00:29:14,270  
PROPULSION, BUT THERE'S SOME  
STUFF THERE TO LOOK AT AS WELL.

649  
00:29:14,270 --> 00:29:18,330  
OUTSIDE OF THAT, LIKE SPACE  
ELEVATORS AND I DON'T THINK

650

00:29:18,330 --> 00:29:19,630

WE'RE WORKING ON THAT.

651

00:29:19,630 --> 00:29:20,770

>> ONE MORE?

652

00:29:20,770 --> 00:29:21,770

>> YEAH.

653

00:29:21,770 --> 00:29:24,190

DID YOU WANT TO GO?

654

00:29:24,190 --> 00:29:25,190

OKAY.

655

00:29:25,190 --> 00:29:27,220

LISTEN, I REALLY APPRECIATE  
THIS.

656

00:29:27,220 --> 00:29:30,450

THIS WAS A GREAT FIRST  
EXPERIENCE AT A SOCIAL.

657

00:29:30,450 --> 00:29:33,350

AND I HOPE YOU GUYS STAY  
ENGAGED.

658

00:29:33,350 --> 00:29:34,710

THANKS VERY MUCH.

659

00:29:34,710 --> 00:29:39,190

[ CHEERS AND APPLAUSE ]

>> THANK YOU.

660

00:29:39,190 --> 00:29:46,360

I DON'T KNOW WHICH MIKE IS ON  
HERE.

661

00:29:46,360 --> 00:29:48,440  
PLEASE REMEMBER WHEN QUESTIONS  
ARE BEING ASKED TO WAIT FOR THE

662  
00:29:48,440 --> 00:29:51,170  
MICROPHONE TO ASK A QUESTION  
BECAUSE WE ARE ON TELEVISION.

663  
00:29:51,170 --> 00:29:53,381  
THE PEOPLE BACK AT HOME COULDN'T  
HEAR YOU IF YOU DIDN'T HAVE A

664  
00:29:53,381 --> 00:29:55,140  
MICROPHONE IN FRONT OF YOU.

665  
00:29:55,140 --> 00:29:57,090  
WE WERE TALKING ABOUT HAWTHORNE  
EARLIER.

666  
00:29:57,090 --> 00:30:00,950  
CAN ANYBODY TELL ME WHAT  
SUPERHERO MOVIE THE HAWTHORNE

667  
00:30:00,950 --> 00:30:07,330  
FACILITY WAS FEATURED IN, THE  
EVIL LAIR OF THE BAD GUYS?

668  
00:30:07,330 --> 00:30:10,070  
THE SAME ONE.

669  
00:30:10,070 --> 00:30:13,000  
>> IT WAS "IRON MAN 2," WASN'T  
IT?

670  
00:30:13,000 --> 00:30:14,900  
>> IT WAS "IRON MAN 2."

671  
00:30:14,900 --> 00:30:18,110  
VERY GOOD.

672

00:30:18,110 --> 00:30:19,630

USELESS TRIVIA POPS IN MY HEAD  
ALL THE TIME.

673

00:30:19,630 --> 00:30:20,630

SORRY ABOUT THAT.

674

00:30:20,630 --> 00:30:21,630

I WANT TO INTRODUCE OUR NEXT  
SPEAKER.

675

00:30:21,630 --> 00:30:25,190

IT IS ED MANGO, HE'S IN CHARGE  
OF THE COMMERCIAL CREW PROGRAM

676

00:30:25,190 --> 00:30:27,490

HERE AT NASA KENNEDY SPACE  
CENTER.

677

00:30:27,490 --> 00:30:31,860

WITHOUT FURTHER ADO, ED.

678

00:30:31,860 --> 00:30:33,740

>> THANKS.

679

00:30:33,740 --> 00:30:36,240

THANKS A LOT.

680

00:30:36,240 --> 00:30:37,650

GOOD MORNING, EVERYBODY.

681

00:30:37,650 --> 00:30:40,000

HOW Y'ALL DOING IN FLORIDA?

682

00:30:40,000 --> 00:30:42,020

THE CHAMBER OF COMMERCE DAY  
HERE.

683

00:30:42,020 --> 00:30:45,800  
AND TOMORROW WE'LL HAVE OUR  
CHAMBER OF COMMERCE LAUNCH.

684  
00:30:45,800 --> 00:30:48,230  
GOOD LUCK TO THE SPACE X GUYS.

685  
00:30:48,230 --> 00:30:52,140  
THEY WILL DO GREAT.

686  
00:30:52,140 --> 00:30:56,210  
IT'S ALWAYS GOOD TO FLY THE  
SPACE STATION, AND IT'S THEIR

687  
00:30:56,210 --> 00:30:58,240  
FIRST CHANCE.

688  
00:30:58,240 --> 00:31:00,510  
AND I THINK WE'RE ALL VERY  
EXCITED ABOUT IT.

689  
00:31:00,510 --> 00:31:02,430  
AND I KNOW YOU GUYS ARE, TOO.

690  
00:31:02,430 --> 00:31:05,550  
SEE, I CAME TO TALK A LITTLE BIT  
MORE ABOUT THE COMMERCIAL CREW

691  
00:31:05,550 --> 00:31:09,620  
PROGRAM WHICH IS A NEXT STEP IN  
HOW WE'RE GOING TO GET HUMANS TO

692  
00:31:09,620 --> 00:31:11,880  
LOW-EARTH ORBIT.

693  
00:31:11,880 --> 00:31:15,110  
THAT'S WHAT I'M HERE TO TALK  
ABOUT AS GWEN SUGGESTED.

694

00:31:15,110 --> 00:31:19,620  
THEY ARE VERY INTERESTED IN  
PURSUING THAT KIND OF WORK IN

695  
00:31:19,620 --> 00:31:20,620  
THE FUTURE.

696  
00:31:20,620 --> 00:31:23,230  
SO THEY ARE ONE OF MANY  
COMPANIES THAT ARE PURSUING

697  
00:31:23,230 --> 00:31:24,230  
THAT.

698  
00:31:24,230 --> 00:31:26,860  
TOMORROW IS ALL ABOUT THEIR  
CARGO MISSION GOING TO ISS.

699  
00:31:26,860 --> 00:31:28,600  
AND I THINK THEY'LL DO GREAT.

700  
00:31:28,600 --> 00:31:32,480  
SEE, FOR A COMMERCIAL CREW, ONE  
OF OUR MOTTOS IS ON THE SCREEN

701  
00:31:32,480 --> 00:31:33,480  
THERE SOMEWHERE.

702  
00:31:33,480 --> 00:31:35,420  
IT SAYS, SAME CREW, NEW RIDE.

703  
00:31:35,420 --> 00:31:40,340  
OUR GOAL IN THE END IS TO  
PROMOTE A CAPABILITY TO GET U.S.

704  
00:31:40,340 --> 00:31:42,550  
ASTRONAUTS TO THE INTERNATIONAL  
SPACE STATION.

705

00:31:42,550 --> 00:31:46,160  
AND IN THE PROCESS, CREATE A  
COMMERCIAL CAPABILITY TO GET

706  
00:31:46,160 --> 00:31:48,430  
AMERICAN SYSTEMS TO LOW-EARTH  
ORBIT.

707  
00:31:48,430 --> 00:31:50,210  
THAT'S REALLY WHAT WE'RE ALL  
ABOUT.

708  
00:31:50,210 --> 00:31:52,470  
SO IN ORDER TO GET STARTED, I'M  
GOING TO SHOW A LITTLE VIDEO.

709  
00:31:52,470 --> 00:32:04,940  
SEE IF THIS WORKS.

710  
00:32:04,940 --> 00:32:29,000  
\\MM  
\\MM

711  
00:32:29,000 --> 00:32:53,060  
>> ALL RIGHT.

712  
00:32:53,060 --> 00:33:11,560  
WELL, WE LIKE HIGH-ENERGY  
VIDEOS.

713  
00:33:11,560 --> 00:33:13,720  
AND OVER THE NEXT COUPLE MONTHS,  
I'M SURE WE'LL BE PUTTING OUT

714  
00:33:13,720 --> 00:33:16,460  
SOME MORE THROUGH OUR PIO FOLKS.

715  
00:33:16,460 --> 00:33:20,910  
AS YOU SAW FROM THAT IDEA, WE  
HOPE -- SOME OF THAT WAS, LIKE,

716

00:33:20,910 --> 00:33:24,110

MODELING AND DIFFERENT  
ANIMATIONS, BUT BY THE MIDDLE OF

717

00:33:24,110 --> 00:33:28,310

THE DECADE, WE HOPE TO BE FLYING  
THOSE VEHICLES ON ORBIT AND ON

718

00:33:28,310 --> 00:33:30,100

THE INTERNATIONAL SPACE STATION.

719

00:33:30,100 --> 00:33:33,280

WE HAVE FOUR FUNDED PARTNERS  
TODAY UNDER CC DEV-2 WHICH IS

720

00:33:33,280 --> 00:33:35,910

THE ACTIVITY WE'RE WORKING  
TODAY.

721

00:33:35,910 --> 00:33:39,840

THOSE PARTNERS ARE SPACE X AND  
SPACE X IS DOING VERY GOOD.

722

00:33:39,840 --> 00:33:44,060

THEY JUST FINISHED SOME CREW  
TRIALS NOT TOO LONG AGO.

723

00:33:44,060 --> 00:33:48,780

AND THEY'VE DONE VERY WELL WITH  
WORKING WITH NASA ASTRONAUTS AND

724

00:33:48,780 --> 00:33:52,190

THEIR CREW MODULE AND WORKING  
THROUGH SOME OF THE ACTIVATION

725

00:33:52,190 --> 00:33:54,870

AND SOME OF THE ACCOMMODATIONS  
THEY NEED TO DO FOR THAT.

726

00:33:54,870 --> 00:33:56,320

VERY SUCCESSFUL.

727

00:33:56,320 --> 00:33:57,320

BOEING -- LET'S SEE.

728

00:33:57,320 --> 00:33:59,390

LET ME WORK THROUGH THESE CHARTS  
HERE.

729

00:33:59,390 --> 00:34:02,360

I'M GOING TO COME OVER HERE AND  
SEE.

730

00:34:02,360 --> 00:34:03,360

ALL RIGHT.

731

00:34:03,360 --> 00:34:07,620

BOEING JUST FINISHED A NUMBER OF  
PARACHUTE DROPS THAT THEY'VE

732

00:34:07,620 --> 00:34:09,710

DONE FROM THE NEVADA DESERT.

733

00:34:09,710 --> 00:34:11,010

THOSE WERE VERY SUCCESSFUL.

734

00:34:11,010 --> 00:34:15,150

THEY DID TWO DROPS TO SHOW HOW  
THEIR PARACHUTE SYSTEM WORK, THE

735

00:34:15,150 --> 00:34:18,290

DRONE SYSTEM AND ALSO THE  
LANDING BACK SYSTEM.

736

00:34:18,290 --> 00:34:20,890

BOEING'S CONCEPT IS TO LAND ON  
LAND.

737

00:34:20,890 --> 00:34:23,419

SO THEY NEED SOMETHING TO DEAL  
WITH THE ENERGY WHEN THEY GET

738

00:34:23,419 --> 00:34:24,940

DOWN RIGHT TO THE SURFACE.

739

00:34:24,940 --> 00:34:27,900

AND THEY HAVE AN AIR BAG SYSTEM  
THAT WORKED VERY WELL ON THIS

740

00:34:27,900 --> 00:34:31,000

LAST DROP.

741

00:34:31,000 --> 00:34:32,860

SIERRA NEVADA IS OUR NEXT GROUP.

742

00:34:32,860 --> 00:34:36,770

AND SIERRA NEVADA IS OFF MAKING  
WHAT THEY CALL AN ENGINEERING

743

00:34:36,770 --> 00:34:40,130

TEST ARTICLE WHICH THIS IS A  
PICTURE OF THE TEST ARTICLE.

744

00:34:40,130 --> 00:34:43,820

THAT TEST ARTICLE WOULD BE FLOWN  
A COUPLE TIMES OVER THE NEXT SIX

745

00:34:43,820 --> 00:34:44,820

MONTHS.

746

00:34:44,820 --> 00:34:47,470

THE FIRST ONE'S GOING TO BE IN A  
FEW WEEKS, ANYWHERE FROM TWO TO

747

00:34:47,470 --> 00:34:48,470

FOUR WEEKS FROM NOW.

748

00:34:48,470 --> 00:34:53,130

THAT'S GOING TO BE A CAPTIVE  
CARRY TEST IN WHICH THEY WILL BE

749

00:34:53,130 --> 00:34:56,159

FLYING IT IN ORDER TO GET SOME  
GOOD DATA ON THEIR SYSTEM AND

750

00:34:56,159 --> 00:34:59,230

THEIR AERODYNAMIC PART OF THE  
SYSTEM AND THEN BE READY TO DROP

751

00:34:59,230 --> 00:35:02,010

THAT AS A PREFLIGHT TEST LATER  
IN THE SUMMER.

752

00:35:02,010 --> 00:35:04,050

PROBABLY LATE SUMMER, EARLY  
FALL.

753

00:35:04,050 --> 00:35:05,190

THEY'RE DOING EXTREMELY WELL.

754

00:35:05,190 --> 00:35:09,210

THEY ALSO HAVE FINISHED THEIR  
VERSION OF A PDR, PRELIMINARY

755

00:35:09,210 --> 00:35:13,560

DESIGN REVIEW, OF THEIR ENTIRE  
DREAM CHASE SYSTEM.

756

00:35:13,560 --> 00:35:16,990

BOEING HAS ALSO COMPLETED ONE  
NOT TOO LONG AGO.

757

00:35:16,990 --> 00:35:19,090

NEXT IS BLUE ORIGIN.

758

00:35:19,090 --> 00:35:22,330

BLUE ORIGIN, I WAS JUST UP IN  
SEATTLE FOR A FEW DAYS UNTIL

759

00:35:22,330 --> 00:35:23,330  
THIS MORNING.

760

00:35:23,330 --> 00:35:27,110  
AND THEY ARE WORKING VERY HARD  
ON TRYING TO GET THEIR

761

00:35:27,110 --> 00:35:28,560  
SPACECRAFT DESIGNED.

762

00:35:28,560 --> 00:35:30,980  
THEY'RE REALLY AT AN EARLIER  
STATE THAN THE OTHERS.

763

00:35:30,980 --> 00:35:34,480  
THEY'RE AT WHAT'S CALLED AN SRR  
WHICH IS A SYSTEMS REQUIREMENT

764

00:35:34,480 --> 00:35:37,150  
LEVEL KIND OF STATE.

765

00:35:37,150 --> 00:35:39,890  
AND THEY FINISHED THEIR SRR OVER  
THE LAST COUPLE DAYS.

766

00:35:39,890 --> 00:35:42,480  
AND WE'RE WORKING COMMENTS WITH  
THEM OVER THE REST OF THIS WEEK

767

00:35:42,480 --> 00:35:43,560  
AND INTO NEXT WEEK.

768

00:35:43,560 --> 00:35:47,490  
AND THEN WE'LL CLOSE OUT THAT  
SRR HERE IN A FEW DAYS.

769

00:35:47,490 --> 00:35:49,480  
ADK IS OUR NEXT ONE.

770  
00:35:49,480 --> 00:35:53,720  
AND Y'ALL KNOW ADK BUILT THE  
BOOSTERS FOR THE SHUTTLE SYSTEM.

771  
00:35:53,720 --> 00:35:58,290  
NOW THEY ARE INTEGRATING  
REALLY TO MAKE IT INTERNATIONAL.

772  
00:35:58,290 --> 00:36:01,220  
THEY'RE INTEGRATING WITH OTHER  
COMPANIES AROUND THE WORLD IN

773  
00:36:01,220 --> 00:36:03,890  
ORDER TO MAKE A NEW LAUNCH  
VEHICLE THEY'RE CALLING LIBERTY.

774  
00:36:03,890 --> 00:36:06,970  
AND WE WORKED WITH THEM ON A  
NUMBER OF AREAS ON THIS NEW

775  
00:36:06,970 --> 00:36:08,210  
LIBERTY ROCKET.

776  
00:36:08,210 --> 00:36:10,750  
THEIR REQUIREMENTS, THEIR SAFETY  
PROCESSES THEY WOULD LIKE TO USE

777  
00:36:10,750 --> 00:36:13,461  
AND THEIR OVERALL CONCEPT FOR  
DESIGN.

778  
00:36:13,461 --> 00:36:14,910  
AND THAT'S GOING QUITE WELL.

779  
00:36:14,910 --> 00:36:17,280  
THEY ARE UNFUNDED WHICH MEANS  
THAT THEY ARE BRINGING THEIR

780

00:36:17,280 --> 00:36:18,790

DOLLARS TO THE TABLE.

781

00:36:18,790 --> 00:36:23,250

NO GOVERNMENT DOLLARS ARE BEING  
USED TO HELP ADK AT THIS POINT.

782

00:36:23,250 --> 00:36:26,580

NASA PAY FOR THE NASA FOLKS TO  
GO HELP THEM, BUT BASICALLY

783

00:36:26,580 --> 00:36:28,530

THEY'RE BRINGING THEIR ENERGY TO  
THE TABLE.

784

00:36:28,530 --> 00:36:30,920

WE'RE BRINGING OURS AND WE  
NEGOTIATE AND TALK ABOUT THE

785

00:36:30,920 --> 00:36:32,090

REQUIREMENTS THAT WAY.

786

00:36:32,090 --> 00:36:34,160

THE NEXT IS ULA.

787

00:36:34,160 --> 00:36:39,560

ULA IS WORKING VERY MUCH WITH  
US, ALSO UNFUNDED.

788

00:36:39,560 --> 00:36:42,480

AND THEY'RE WORKING ON THEIR  
LAUNCH SYSTEM.

789

00:36:42,480 --> 00:36:45,730

THEY'RE USING AN ATLAS LAUNCH  
SYSTEM, AND THEY ARE WORKING

790

00:36:45,730 --> 00:36:49,450

THROUGH THEIR LEVEL OF A SYSTEMS  
REQUIREMENTS REVIEW IN ORDER TO

791

00:36:49,450 --> 00:36:52,060

MAKE THEIR ATLAS 5 HUMAN RATING.

792

00:36:52,060 --> 00:36:55,250

AND YOU'VE GOT TO DO THAT VERY  
CAREFULLY BECAUSE THEY FLY ON

793

00:36:55,250 --> 00:36:56,580

OTHER MISSIONS FOR D.O.D.

794

00:36:56,580 --> 00:36:58,220

AND  
OTHER CUSTOMERS.

795

00:36:58,220 --> 00:36:59,590

WE CAN'T MAKE A WHOLE NEW  
ROCKET.

796

00:36:59,590 --> 00:37:01,290

THAT WOULD BE WAY TOO EXPENSIVE.

797

00:37:01,290 --> 00:37:05,310

WE'RE TRYING TO FIGURE OUT WAYS  
TO USE THAT ROCKET -- THEY WOULD

798

00:37:05,310 --> 00:37:07,340

LIKE TO USE THAT ROCKET TO FLY  
HUMANS, AND WE'RE HELPING THEM

799

00:37:07,340 --> 00:37:08,500

WORK THROUGH THAT.

800

00:37:08,500 --> 00:37:11,791

AND THE LAST UNFUNDED PARTNER IS  
EX-CALIBER.

801

00:37:11,791 --> 00:37:17,140  
EXCALIBUR IS USING A VERY OLD  
DESIGN AND TRYING TO PUT NEW

802  
00:37:17,140 --> 00:37:19,350  
SYSTEMS IN THAT DESIGN.

803  
00:37:19,350 --> 00:37:20,450  
THEY'RE DOING QUITE WELL.

804  
00:37:20,450 --> 00:37:23,120  
THEY ARE GETTING TO WHAT THEY  
CALL CONCEPTUAL REVIEW.

805  
00:37:23,120 --> 00:37:25,240  
AND THAT WILL BE COMING FORWARD  
HERE IN THE NEXT MONTH OR SO.

806  
00:37:25,240 --> 00:37:26,910  
THEY ARE ALSO UNFUNDED.

807  
00:37:26,910 --> 00:37:30,790  
THE FIRST FOUR, LIKE I TALKED  
ABOUT, SPACE X, BOEING, SIERRA

808  
00:37:30,790 --> 00:37:36,360  
NEVADA AND BLUE ORIGIN ARE  
WORKING UNDER FUNDED ESSAYS, AND

809  
00:37:36,360 --> 00:37:39,680  
THAT'S WORTH ABOUT \$320 MILLION  
THAT WE'RE SPENDING BETWEEN THE

810  
00:37:39,680 --> 00:37:40,680  
FOUR COMPANIES.

811  
00:37:40,680 --> 00:37:42,200  
THAT'S WHERE WE'RE AT RIGHT NOW.

812

00:37:42,200 --> 00:37:45,301  
IN THE FUTURE, WE'LL BE ENTERING  
INTO ANOTHER ROUND OF SAAs HERE

813  
00:37:45,301 --> 00:37:47,800  
BY THE MID TO LATE SUMMER.

814  
00:37:47,800 --> 00:37:51,260  
AND THEN INTO A CONTRACT FOR  
CERTIFICATION IN A COUPLE YEARS.

815  
00:37:51,260 --> 00:37:55,180  
THE GOAL IS TO FLY BY THE MIDDLE  
OF THE DECADE.

816  
00:37:55,180 --> 00:37:57,560  
2015, 2016, 2017 TIME FRAME.

817  
00:37:57,560 --> 00:38:02,280  
IN ORDER TO GO FLY A SYSTEM TO  
THE INTERNATIONAL SPACE STATION

818  
00:38:02,280 --> 00:38:05,670  
AND MAKE OUR -- ALLOW OUR CREWS  
TO ROTATE THROUGH AN

819  
00:38:05,670 --> 00:38:07,190  
AMERICAN-MADE SYSTEM.

820  
00:38:07,190 --> 00:38:10,770  
TODAY, IF YOU ALL REMEMBER,  
SOYUZ LAUNCH THE OTHER DAY, THEY

821  
00:38:10,770 --> 00:38:12,880  
DOCKED YESTERDAY.

822  
00:38:12,880 --> 00:38:15,550  
AND NOW WE HAVE SIX PEOPLE BACK  
ON STATION.

823

00:38:15,550 --> 00:38:18,030

SOMEDAY IN ABOUT FOUR OR FIVE  
YEARS, WE'LL BE USING ONE OF

824

00:38:18,030 --> 00:38:22,930

THESE SYSTEMS IN ORDER TO GET  
OUR CREW TO KEEP THAT STATION

825

00:38:22,930 --> 00:38:25,110

MANNED AT SIX OR SEVEN PEOPLE.

826

00:38:25,110 --> 00:38:26,290

SO THAT'S WHAT I HAVE PREPARED.

827

00:38:26,290 --> 00:38:28,900

I'LL CERTAINLY ANSWER YOUR  
QUESTIONS FOR AS LONG AS THEY

828

00:38:28,900 --> 00:38:30,540

LET ME.

829

00:38:30,540 --> 00:38:31,560

SO QUESTIONS.

830

00:38:31,560 --> 00:38:33,020

NO QUESTIONS.

831

00:38:33,020 --> 00:38:34,020

WOW.

832

00:38:34,020 --> 00:38:37,900

I'LL LET YOU THINK ABOUT THAT.

833

00:38:37,900 --> 00:38:39,320

>> QUESTIONS.

834

00:38:39,320 --> 00:38:45,020

I'VE GOT THE MIKE.

835

00:38:45,020 --> 00:38:46,450

OKAY.

836

00:38:46,450 --> 00:38:48,940

>> HOW LONG IS THE INTERNATIONAL  
SPACE STATION GOING TO REMAIN

837

00:38:48,940 --> 00:38:50,150

ACTIVE?

838

00:38:50,150 --> 00:38:54,270

>> TODAY OUR AGREEMENT WITH  
CONGRESS IS THAT THEY'RE ACTIVE

839

00:38:54,270 --> 00:38:55,420

TILL 2020.

840

00:38:55,420 --> 00:38:59,000

OF COURSE, AS WE DO MORE  
RESEARCH ON BOARD STATION AND

841

00:38:59,000 --> 00:39:01,390

THAT RESEARCH COMES BACK DOWN TO  
THE GROUND AND WE CAN SEE WHAT

842

00:39:01,390 --> 00:39:05,020

THAT MEANS FOR THE REST OF US,  
THEN WE'LL PROBABLY THINK ABOUT

843

00:39:05,020 --> 00:39:07,990

DO WE WANT TO EXTEND STATION.

844

00:39:07,990 --> 00:39:11,750

SO AT LEAST 2020.

845

00:39:11,750 --> 00:39:13,610

>> YES, IT'S REALLY EXCITING  
WHAT YOU'RE DOING.

846

00:39:13,610 --> 00:39:16,350

I WANTED TO PUT IN A PLUG FOR  
NASA TECHNOLOGY TRANSFER.

847

00:39:16,350 --> 00:39:19,560

CAN YOU SPEAK A LITTLE ABOUT THE  
LANGLEY TRANSFER ON THE SIERRA

848

00:39:19,560 --> 00:39:20,990

NEVADA DESIGN?

849

00:39:20,990 --> 00:39:21,990

>> YES.

850

00:39:21,990 --> 00:39:25,280

>> FOR EVERYBODY HERE WHO MIGHT  
NOT BE AS AWARE OF IT AS OTHERS.

851

00:39:25,280 --> 00:39:32,119

>> LET'S GO BACK TO THAT  
PICTURE, MAYBE.

852

00:39:32,119 --> 00:39:36,140

SIERRA NEVADA IS USING -- THEY  
CALL IT THE DREAM CHASER, BUT

853

00:39:36,140 --> 00:39:41,060

PEDIGREE IS FROM A PROGRAM THAT  
NASA STARTED MANY YEARS AGO

854

00:39:41,060 --> 00:39:42,980

CALLED THE HL-20.

855

00:39:42,980 --> 00:39:47,330

AND IT'S A VERY SIMILAR DESIGN.

856

00:39:47,330 --> 00:39:49,390

ONE OF THE THINGS THAT HAPPENS

## THERE ON A SPACE ACTIVE AGREEMENT

857

00:39:49,390 --> 00:39:52,950

WHICH IS HOW WE DO OUR WORK WITH  
OUR PARTNERS IS THAT WE BOTH

858

00:39:52,950 --> 00:39:55,650

BRING CAPABILITIES TO THE TABLE.

859

00:39:55,650 --> 00:39:56,650

AND THEN WE WORK THEM TOGETHER.

860

00:39:56,650 --> 00:39:59,450

IT'S A PARTNERSHIP VERSUS A  
CONTRACT WHERE IT'S A CUSTOMER

861

00:39:59,450 --> 00:40:01,200

AND A PROVIDER.

862

00:40:01,200 --> 00:40:04,530

IN THIS CASE, IT'S A  
PARTNERSHIP.

863

00:40:04,530 --> 00:40:07,450

AND WITHIN THAT PARTNERSHIP,  
THEY WENT AND GOT THE OLD DATA,

864

00:40:07,450 --> 00:40:08,990

THAT HL-20 USED.

865

00:40:08,990 --> 00:40:13,070

THEY USED THE LANGLEY FOLKS TO  
HELP WITH THE AERODYNAMICS OF

866

00:40:13,070 --> 00:40:14,740

THE SYSTEM BECAUSE IT IS A  
WINGED VEHICLE.

867

00:40:14,740 --> 00:40:19,230

IT WILL FLY -- I WOULDN'T SAY  
SIMILAR TO THE SHUTTLE, BUT NOT

868

00:40:19,230 --> 00:40:22,000  
TOO DISTANT FROM WHAT SHUTTLE  
WOULD FLY LIKE.

869

00:40:22,000 --> 00:40:23,000  
AND IT LANDS ON A RUNWAY.

870

00:40:23,000 --> 00:40:25,640  
AND SO YOU HAVE A LOT OF MORE  
AERODYNAMIC ISSUES YOU'VE GOT TO

871

00:40:25,640 --> 00:40:27,860  
WORK THROUGH IN YOUR DESIGN.

872

00:40:27,860 --> 00:40:28,860  
THEY'RE DOING THAT.

873

00:40:28,860 --> 00:40:31,240  
THEY'RE DOING THAT HIGHLY WITH  
NASA CENTERS.

874

00:40:31,240 --> 00:40:36,220  
AND IN THE CASE OF THESE FOLKS  
ARE DOING IT WITH THE LANGLEY

875

00:40:36,220 --> 00:40:38,660  
CENTER.

876

00:40:38,660 --> 00:40:40,480  
>> MORE QUESTIONS?

877

00:40:40,480 --> 00:40:45,770  
>> I NOTICED THAT YOU GUYS HAVE  
BEGUN A RETROFIT OF THE VAB I

878

00:40:45,770 --> 00:40:49,890

THINK ESSENTIALLY SINCE IT WAS  
BUILT FOR THE APOLLO PROGRAM.

879

00:40:49,890 --> 00:40:53,870  
AND DO YOU ANTICIPATE ANY OF  
YOUR VENDORS USING IT IN LAUNCH

880

00:40:53,870 --> 00:40:56,110  
COMPLEX 36?

881

00:40:56,110 --> 00:40:58,120  
>> TWO QUESTIONS THERE.

882

00:40:58,120 --> 00:41:00,620  
AS FAR AS THE VAB, I THINK  
THERE'S SOMEONE THAT MIGHT BE

883

00:41:00,620 --> 00:41:04,410  
COMING UP LATER TO TALK ABOUT  
THE MODS WE'RE DOING.

884

00:41:04,410 --> 00:41:08,870  
IF ANY OF THE PARTNERS WOULD  
LIKE TO USE LC-39 WHERE THE

885

00:41:08,870 --> 00:41:12,340  
SHUTTLE FLEW OUT OF, THEY ARE  
CERTAINLY WELCOME TO DO THAT.

886

00:41:12,340 --> 00:41:15,940  
THEY WORK WITH THE KENNEDY  
CENTER AND TRYING TO WORK OUT AN

887

00:41:15,940 --> 00:41:18,730  
AGREEMENT ABOUT HOW TO GO USE  
THAT PARTICULAR SPACE.

888

00:41:18,730 --> 00:41:24,380  
FROM A PROGRAM ADDICT  
STANDPOINT, WE HELP THEM, BUT

889

00:41:24,380 --> 00:41:27,520

THAT DISCUSSION IS REALLY  
BETWEEN THE CENTER AND THE

890

00:41:27,520 --> 00:41:28,520

PARTNER.

891

00:41:28,520 --> 00:41:31,740

AND THEN WE'LL EVALUATE IF THAT  
MAKES SENSE, IF THEIR TIMING IS

892

00:41:31,740 --> 00:41:34,370

RIGHT, WHAT MODS HAVE TO BE DONE  
AND THAT KIND OF THING.

893

00:41:34,370 --> 00:41:35,960

AND THEN WE'LL WORK WITH THE  
OTHER PROGRAMS.

894

00:41:35,960 --> 00:41:40,710

OBVIOUSLY THE VAB IS ALSO BEING  
USED FOR SLS AND ORION.

895

00:41:40,710 --> 00:41:43,620

WE HAVE TO MAKE SURE THAT WHAT  
OUR PARTNER MIGHT WANT TO DO

896

00:41:43,620 --> 00:41:47,760

WON'T INTERFERE WITH WHAT SLS  
AND ORION NEED TO DO.

897

00:41:47,760 --> 00:41:51,370

AND AS FAR AS LC-36, THAT'S A  
LOT SMALLER PAD.

898

00:41:51,370 --> 00:41:53,800

SO I'M NOT SURE IF ANYONE WILL  
BE USING THAT FOR COMMERCIAL

899

00:41:53,800 --> 00:41:56,580

CREW.

900

00:41:56,580 --> 00:42:03,470

OTHER QUESTIONS.

901

00:42:03,470 --> 00:42:05,100

>> COULD YOU TALK A LITTLE BIT  
ABOUT THE GOALS?

902

00:42:05,100 --> 00:42:07,890

IT SEEMS LIKE YOU HAVE SEVERAL  
DIFFERENT CAPSULES AND DIFFERENT

903

00:42:07,890 --> 00:42:08,890

SYSTEMS.

904

00:42:08,890 --> 00:42:12,060

IT'S GOING TO BE A COMBINATION  
OF ALL WHEN YOU ACTUALLY START

905

00:42:12,060 --> 00:42:17,310

FLYING CREWS, OR ARE YOU GOING  
TO NARROW IT DOWN TO ONE OR TWO?

906

00:42:17,310 --> 00:42:19,150

>> WELL, LET'S SEE.

907

00:42:19,150 --> 00:42:22,790

IN THE END, THE MORE CAPABILITY  
WE CAN MOVE INTO LOW-EARTH

908

00:42:22,790 --> 00:42:27,070

ORBIT, THE BETTER OFF THE PLANET  
WOULD BE.

909

00:42:27,070 --> 00:42:30,120

SO WE HAVE A MISSION TO GET TO  
ISS.

910

00:42:30,120 --> 00:42:33,820

WE ALSO HAVE A MISSION TO TRY TO  
HELP SPUR COMMERCIAL INDUSTRY IN

911

00:42:33,820 --> 00:42:35,020

SPACE.

912

00:42:35,020 --> 00:42:38,040

IN ORDER TO DO THAT, WE HAVE  
MULTIPLE PARTNERS TODAY, SEVEN.

913

00:42:38,040 --> 00:42:41,160

AND THE NEXT ROUND, WE WANT AN  
INTEGRATED SYSTEM, SO IT WOULD

914

00:42:41,160 --> 00:42:42,910

PROBABLY BE LESS THAN SEVEN  
PARTNERS.

915

00:42:42,910 --> 00:42:46,119

SOME OF THESE GUYS WILL COMBINE  
AND THAT KIND OF THING.

916

00:42:46,119 --> 00:42:49,960

AND SO I IMAGINE IT WILL BE A  
LOT LESS THAN SEVEN.

917

00:42:49,960 --> 00:42:53,520

IN THE END, WE WOULD LIKE TO  
TAKE AS MANY AS WE -- WE

918

00:42:53,520 --> 00:42:58,050

TAXPAYERS -- CAN AFFORD INTO  
CERTIFICATION AND THEN LOOK AT

919

00:42:58,050 --> 00:42:59,050

SERVICES.

920

00:42:59,050 --> 00:43:01,210  
WHEN IT COMES TIME FOR SERVICES  
ISS, WE'LL PROBABLY HAVE ONE OR

921  
00:43:01,210 --> 00:43:03,310  
TWO IN THE END.

922  
00:43:03,310 --> 00:43:06,700  
BUT THE POINT THERE IS IF YOU GO  
CREATE THE CAPABILITY, THEN YOU

923  
00:43:06,700 --> 00:43:10,600  
CAN GO, AND THAT CAPABILITY CAN  
BE USED FOR OTHER MISSIONS TO

924  
00:43:10,600 --> 00:43:11,950  
LOW-EARTH ORBIT.

925  
00:43:11,950 --> 00:43:15,160  
FOR EXAMPLE, IF YOU LOOK AT WHAT  
HAPPENED DURING THE TANKER

926  
00:43:15,160 --> 00:43:19,680  
DEVELOPMENT BACK IN THE '50s AND  
'60s WITH THE KC-135, THAT WAS

927  
00:43:19,680 --> 00:43:21,570  
BEING USED FOR THE AIR FORCE.

928  
00:43:21,570 --> 00:43:24,230  
AND BOEING LOOKED AT THAT AND  
SAID, WELL, MAYBE WE CAN MAKE

929  
00:43:24,230 --> 00:43:25,640  
THAT INTO A COMMERCIAL AIRLINE.

930  
00:43:25,640 --> 00:43:26,640  
AND THEY DID.

931

00:43:26,640 --> 00:43:30,840  
AND BECAUSE OF THAT OFFSHOOT,  
McDONNELL OR DOUGLAS AT THE TIME

932  
00:43:30,840 --> 00:43:34,730  
DEVELOPED THE DC-8 AND LOCKHEED  
STARTED DEVELOPING THEIR

933  
00:43:34,730 --> 00:43:35,730  
VERSION.

934  
00:43:35,730 --> 00:43:39,060  
AND SO COMPETITION WAS CREATED  
BY DOING THAT.

935  
00:43:39,060 --> 00:43:40,460  
AND THAT'S THE SAME KIND OF  
THING HERE.

936  
00:43:40,460 --> 00:43:44,180  
WE ARE SPURRING A GOVERNMENT  
NEED THAT WILL ALSO HELP AN

937  
00:43:44,180 --> 00:43:47,510  
INDUSTRY GROW JUST LIKE  
COMMERCIAL AIRLINES DID AND

938  
00:43:47,510 --> 00:43:48,510  
JETS.

939  
00:43:48,510 --> 00:43:49,510  
OTHER QUESTIONS?

940  
00:43:49,510 --> 00:43:51,820  
>> I WAS JUST GOING TO FOLLOW UP  
ON THAT.

941  
00:43:51,820 --> 00:43:55,130  
IS THIS A LOT LIKE THE MODEL OF  
THE POST OFFICE FLYING AIRMAIL

942

00:43:55,130 --> 00:43:57,830

WITH ANYBODY WHO WOULD CARRY IT  
BACK IN THE OLD DAYS AS A WAY TO

943

00:43:57,830 --> 00:44:01,490

GET THE AIRCRAFT AND AIRLINE  
BUSINESS GOING?

944

00:44:01,490 --> 00:44:02,950

>> YES.

945

00:44:02,950 --> 00:44:06,290

I'VE USED THAT ANALOGY BEFORE.

946

00:44:06,290 --> 00:44:07,290

VERY GOOD.

947

00:44:07,290 --> 00:44:11,740

YOU KNOW, IF YOU LOOK BACK AT  
THE HISTORY -- IT'S SO OLD THAT

948

00:44:11,740 --> 00:44:13,450

WE'RE RETHINKING IT.

949

00:44:13,450 --> 00:44:17,890

IN THE POST OFFICE ERA, AT FIRST  
THE GOVERNMENT BOUGHT AIRPLANES

950

00:44:17,890 --> 00:44:20,790

AND FLEW THE AIRPLANES AROUND  
FROM POINT TO POINT TO MOVE MAIL

951

00:44:20,790 --> 00:44:24,060

AROUND REALLY FROM WASHINGTON TO  
NEW YORK TO BOSTON AND

952

00:44:24,060 --> 00:44:25,060

NORTHEAST.

953

00:44:25,060 --> 00:44:27,720

AND USED TRAINS TO THE WEST.

954

00:44:27,720 --> 00:44:32,480

AND OVER TIME, THE GOVERNMENT  
SAID, YOU KNOW, THIS IS VERY

955

00:44:32,480 --> 00:44:34,380

DIFFICULT FOR US TO GO DO.

956

00:44:34,380 --> 00:44:38,020

THIS IS PROBABLY A MARKET THAT  
THE COMMERCIAL WORLD MIGHT WANT

957

00:44:38,020 --> 00:44:39,020

TO GO DO.

958

00:44:39,020 --> 00:44:41,750

SO THEN THEY TURNED IT OVER AND  
THEY SOLD CONTRACTS FOR PEOPLE

959

00:44:41,750 --> 00:44:43,000

TO GO FLY.

960

00:44:43,000 --> 00:44:45,610

AND THEY WERE NOW PRIVATELY  
OWNED AIRPLANES THAT FLEW MAIL

961

00:44:45,610 --> 00:44:50,070

FROM POINT A TO POINT B.  
AS THAT WENT ON, THOSE PRIVATE

962

00:44:50,070 --> 00:44:52,890

COMPANIES SAID, YOU KNOW, WE CAN  
CARRY MAIL TODAY.

963

00:44:52,890 --> 00:44:54,680

WE CAN CARRY PASSENGERS

TOMORROW.

964

00:44:54,680 --> 00:44:57,510

SO THEN THEY STARTED BUILDING  
MODELS THAT WOULD START BEING

965

00:44:57,510 --> 00:45:01,550

ABLE TO BRING PASSENGERS AS WELL  
AS CARGO OR MAIL OR WHATEVER

966

00:45:01,550 --> 00:45:03,360

FROM POINT A TO POINT B.  
AND THAT'S HOW THE AIRLINE

967

00:45:03,360 --> 00:45:04,790

INDUSTRY REALLY GOT GOING.

968

00:45:04,790 --> 00:45:09,400

AND IT WAS THE IDEA THAT THE  
GOVERNMENT HAD THAT WHY MAKE

969

00:45:09,400 --> 00:45:14,040

SOMETHING ONLY GOVERNMENT WHEN  
THE TECHNOLOGY IS THERE, THE

970

00:45:14,040 --> 00:45:16,640

CAPABILITY IS THERE, LET'S LET  
INDUSTRY GO OFF AND WORK IT.

971

00:45:16,640 --> 00:45:20,530

AND THAT'S KIND OF THE SAME  
MOTTO WE'RE FOLLOWING.

972

00:45:20,530 --> 00:45:22,870

SO HOW MANY OF YOU WANT TO FLY  
ONE OF THESE VEHICLES?

973

00:45:22,870 --> 00:45:24,950

ALL RIGHT.

974

00:45:24,950 --> 00:45:27,030

OKAY, GOOD.

975

00:45:27,030 --> 00:45:29,120

ALL RIGHT.

976

00:45:29,120 --> 00:45:30,360

LET ME ASK ANOTHER QUESTION.

977

00:45:30,360 --> 00:45:32,360

I COULD ASK QUESTIONS, TOO.

978

00:45:32,360 --> 00:45:36,160

WHY DOES ONE PERSON WANT TO FLY  
ON ONE OF THESE VEHICLES?

979

00:45:36,160 --> 00:45:39,010

WHAT MOTIVATES YOU TO WANT TO  
FLY ONE OF THESE VEHICLES ON ISS

980

00:45:39,010 --> 00:45:40,140

OR LOW-EARTH ORBIT?

981

00:45:40,140 --> 00:45:46,160

>> I WANT TO SEE WHAT IT LOOKS  
LIKE FROM UP THERE, FEEL THAT

982

00:45:46,160 --> 00:45:48,670

PEACEFULNESS.

983

00:45:48,670 --> 00:45:49,670

VERY COOL.

984

00:45:49,670 --> 00:45:50,910

I CAN RELATE TO THAT.

985

00:45:50,910 --> 00:45:54,300

SOMETIMES WHEN I TALK, IF YOU

LOOK AT IT FROM A PLANET

986

00:45:54,300 --> 00:45:57,270

STANDPOINT, THE CREWS HAVE BEEN  
ON STATION.

987

00:45:57,270 --> 00:46:00,370

AND THE DEPUTY OF OUR PROGRAM IS  
BRENT JET, AND HE'S AN

988

00:46:00,370 --> 00:46:02,090

ASTRONAUT, FLOWN FOUR TIMES.

989

00:46:02,090 --> 00:46:06,250

SO HE'S SEEN THE BLUE MARBLE  
FROM 230 MILES OUT.

990

00:46:06,250 --> 00:46:07,420

AND IT IS INCREDIBLE.

991

00:46:07,420 --> 00:46:10,100

AND I THINK THAT WOULD BE  
INCREDIBLE TO SEE THE PLANET.

992

00:46:10,100 --> 00:46:13,840

AND YOU THINK, WELL, WE ARE JUST  
ONE OVERALL SPECIES ON THE

993

00:46:13,840 --> 00:46:20,109

PLANET, THAT WE SHOULD LEARN HOW  
TO USE THE WHOLE PLANET.

994

00:46:20,109 --> 00:46:23,020

>> WELL, I WOULD WANT TO FLY IF  
I COULD GO TO THE MOON.

995

00:46:23,020 --> 00:46:25,370

BUT I'M A TEACHER.

996

00:46:25,370 --> 00:46:28,620  
AND THERE ARE STUDENTS WATCHING  
OUT THERE.

997  
00:46:28,620 --> 00:46:31,210  
SO I WOULD LIKE TO ASK A  
QUESTION FOR THEM.

998  
00:46:31,210 --> 00:46:34,650  
YOU KNOW, FOR YOU TO ANSWER TO  
THEM.

999  
00:46:34,650 --> 00:46:36,880  
A LOT OF PEOPLE ARE THINKING, A  
LOT OF THE STUDENTS ARE THINKING

1000  
00:46:36,880 --> 00:46:40,660  
THERE'S NO FUTURE FOR ME IN  
SPACE BECAUSE THE SHUTTLE ERA IS

1001  
00:46:40,660 --> 00:46:41,690  
OVER.

1002  
00:46:41,690 --> 00:46:43,680  
THAT'S WHAT THEY KNOW IS A  
SHUTTLE ERA.

1003  
00:46:43,680 --> 00:46:46,630  
SO WHAT CAN YOU SAY TO YOUNG  
PEOPLE OUT THERE ABOUT THE

1004  
00:46:46,630 --> 00:46:51,020  
FUTURE OF SPACE EXPLORATION AND  
THEIR OPPORTUNITIES?

1005  
00:46:51,020 --> 00:46:55,360  
>> OH, I THINK OPPORTUNITIES ARE  
ABOUND.

1006  
00:46:55,360 --> 00:46:58,840

ESPECIALLY FOR THE KIDS WHO WERE  
IN SCHOOL TODAY.

1007

00:46:58,840 --> 00:47:04,020

IF YOU LOOK AT, IN MY MIND, THEY  
ARE BOUND BECAUSE IF WE DREAM

1008

00:47:04,020 --> 00:47:05,960

IT, IT WILL HAPPEN.

1009

00:47:05,960 --> 00:47:06,960

FIRST WE HAVE TO DREAM IT.

1010

00:47:06,960 --> 00:47:09,440

AND THESE COMPANIES TODAY ARE  
DREAMING VERY DIFFERENT

1011

00:47:09,440 --> 00:47:10,440

THOUGHTS.

1012

00:47:10,440 --> 00:47:12,960

IF YOU LOOK AT A WINGED VEHICLE  
COMPARED TO THIS CAPSULE

1013

00:47:12,960 --> 00:47:16,380

COMPARED TO WHAT SPACE X IS  
TRYING TO DO TOMORROW, VERY

1014

00:47:16,380 --> 00:47:17,890

DIFFERENT DREAMS.

1015

00:47:17,890 --> 00:47:18,920

WITH THE SAME GOAL.

1016

00:47:18,920 --> 00:47:21,310

AND SO THEY ARE DREAMING IT, AND  
THEY'RE TRYING TO MAKE IT

1017

00:47:21,310 --> 00:47:22,310

HAPPEN.

1018

00:47:22,310 --> 00:47:23,981

AND I THINK THAT THE NEXT  
GENERATION, THE KIDS THAT ARE IN

1019

00:47:23,981 --> 00:47:28,930

SCHOOL TODAY, IF THEY WANT TO GO  
DO SOMETHING, THEY CAN GO DO IT

1020

00:47:28,930 --> 00:47:30,670

WITH THE HELP OF THE COUNTRY,  
OBVIOUSLY.

1021

00:47:30,670 --> 00:47:33,730

BUT IF YOU LOOK AT HOW MUCH WE  
SPEND ON SPACE AND HOW MUCH

1022

00:47:33,730 --> 00:47:36,190

WE'RE SPENDING ON WHAT WE'RE  
DOING TODAY, IT'S RELATIVELY A

1023

00:47:36,190 --> 00:47:40,330

SMALL AMOUNT OF MONEY IN ORDER  
TO GO GET TO LOW-EARTH ORBIT.

1024

00:47:40,330 --> 00:47:41,340

WHY GO TO SPACE?

1025

00:47:41,340 --> 00:47:47,060

WELL, LIKE THIS LADY SAID HERE,  
IT'S TO SEE THAT WE ARE ALL ON

1026

00:47:47,060 --> 00:47:48,060

ONE PLANET.

1027

00:47:48,060 --> 00:47:49,280

ALSO, TO GO DO RESEARCH.

1028

00:47:49,280 --> 00:47:52,420  
YOU LOOK AT ISS AND WHAT IT'S  
CAPABLE OF DOING ON RESEARCH, A

1029  
00:47:52,420 --> 00:47:54,630  
HUGE AMOUNT OF RESEARCH YOU CAN  
DO ON STATION.

1030  
00:47:54,630 --> 00:47:57,619  
AND THAT RESEARCH ISN'T GOING TO  
JUST END NEXT WEEK, NEXT YEAR OR

1031  
00:47:57,619 --> 00:47:59,210  
WITH ASTRONAUTS WE HAVE TODAY.

1032  
00:47:59,210 --> 00:48:02,040  
IT'S GOING TO END WITH  
SCIENTISTS, NOT JUST ASTRONAUTS,

1033  
00:48:02,040 --> 00:48:04,840  
THE SCIENTISTS AND ENGINEERS  
GOING TO SPACE STATION OR GOING

1034  
00:48:04,840 --> 00:48:07,620  
TO OTHER PLACES IN LOW-EARTH  
ORBIT TO DO THE KIND OF RESEARCH

1035  
00:48:07,620 --> 00:48:10,640  
YOU NEED TO DO IN LOW-EARTH  
ORBIT TO HELP THE PEOPLE BACK ON

1036  
00:48:10,640 --> 00:48:11,640  
THE PLANET.

1037  
00:48:11,640 --> 00:48:12,820  
THAT IS HUGE.

1038  
00:48:12,820 --> 00:48:15,980  
YOU THINK ABOUT THE MEDICAL  
FIELDS THAT CAN GO HELP, THE

1039

00:48:15,980 --> 00:48:19,280

BIOENGINEERING FIELDS THAT CAN  
HELP WITH ZERO-G CAPABILITIES

1040

00:48:19,280 --> 00:48:20,450

YOU CAN BRING BACK TO EARTH.

1041

00:48:20,450 --> 00:48:22,670

IT'S ALL ABOUT THE PEOPLE ON  
EARTH.

1042

00:48:22,670 --> 00:48:26,310

AND THEN TO ME, THAT REALLY CAN  
ENERGIZE ANYBODY, WHETHER OR NOT

1043

00:48:26,310 --> 00:48:32,200

YOU WANT TO BE IN THE MEDICAL  
FIELD, ENGINEERING FIELD, MAYBE

1044

00:48:32,200 --> 00:48:35,540

WORK ON ROCKETS, BEING A  
TECHNICIAN AND WORK ON ROCKETS,

1045

00:48:35,540 --> 00:48:36,540

VERY COOL STUFF.

1046

00:48:36,540 --> 00:48:39,140

SO THERE'S LOTS OF CAPABILITIES  
OUT THERE I THINK PEOPLE CAN

1047

00:48:39,140 --> 00:48:40,440

REALLY GET EXCITED FOR.

1048

00:48:40,440 --> 00:48:42,780

>> WELL, WHAT WOULD BE ONE PIECE  
OF ADVICE YOU WOULD HAVE

1049

00:48:42,780 --> 00:48:46,600

STUDENTS, CHILDREN WHO ARE  
INTERESTED IN PURSUING A CAREER

1050

00:48:46,600 --> 00:48:47,600

IN SPACE?

1051

00:48:47,600 --> 00:48:49,180

WHAT SHOULD THEY DO NOW?

1052

00:48:49,180 --> 00:48:50,720

MY KIDS ARE 7 AND 8 YEARS OLD.

1053

00:48:50,720 --> 00:48:54,880

>> IT'S A GOOD AGE TO START  
THINKING ABOUT SOME OF THAT

1054

00:48:54,880 --> 00:48:55,880

STUFF.

1055

00:48:55,880 --> 00:49:00,550

FIRST OF ALL, FOR ME, I WOULD BE  
VERY GOOD AT MATH AND SCIENCE.

1056

00:49:00,550 --> 00:49:02,480

MATH AND SCIENCE IS VERY  
IMPORTANT.

1057

00:49:02,480 --> 00:49:04,880

AND NOT EVERYONE IS GOOD AT MATH  
AND SCIENCE.

1058

00:49:04,880 --> 00:49:07,590

SO IF YOU'RE NOT GOOD AT IT,  
THAT'S OKAY.

1059

00:49:07,590 --> 00:49:09,750

BUT YOU CAN LEARN SOME OF THAT  
STUFF, AND THERE'S OTHER

1060

00:49:09,750 --> 00:49:12,500  
OPPORTUNITIES THAT ARE NOT JUST  
MATH AND SCIENCE.

1061  
00:49:12,500 --> 00:49:14,370  
IF YOU'RE MATH AND SCIENCE, I  
THINK THAT HELPS.

1062  
00:49:14,370 --> 00:49:18,320  
THE OTHER THING IS, WHEN I WAS 7  
AND 8 YEARS OLD, WE WERE LANDING

1063  
00:49:18,320 --> 00:49:19,980  
ON THE MOON.

1064  
00:49:19,980 --> 00:49:22,770  
AND I SAT IN FRONT OF THAT TV.

1065  
00:49:22,770 --> 00:49:25,520  
ALL THE COUSINS WERE THERE, THE  
AUNTS AND UNCLES ALL SAT IN

1066  
00:49:25,520 --> 00:49:28,210  
FRONT AND WATCHED WALTER  
CRONKITE TALK ABOUT WALKING ON

1067  
00:49:28,210 --> 00:49:29,210  
THE MOON.

1068  
00:49:29,210 --> 00:49:30,210  
THAT INSPIRED ME.

1069  
00:49:30,210 --> 00:49:31,750  
I WANT TO DO SOMETHING LIKE  
THAT.

1070  
00:49:31,750 --> 00:49:33,860  
AT THAT POINT I WANTED TO BE AN  
ASTRONAUT, OBVIOUSLY BECAUSE

1071

00:49:33,860 --> 00:49:37,450

THAT'S ALL YOU SAW WAS GUYS  
WALKING ON THE MOON.

1072

00:49:37,450 --> 00:49:42,170

BUT FOR ME, I THEN GOT VERY  
INTERESTED IN EVERY SPACE

1073

00:49:42,170 --> 00:49:43,310

MISSION AFTER THAT.

1074

00:49:43,310 --> 00:49:48,480

I WOULD BUG MY TEACHERS IN  
JUNIOR HIGH TO SHOW, PUT IT ON

1075

00:49:48,480 --> 00:49:51,530

THE TV, TO SHOW, HA ARE THEY  
DOING?

1076

00:49:51,530 --> 00:49:52,810

AREN'T THEY LAUNCHING TODAY?

1077

00:49:52,810 --> 00:49:55,110

AREN'T THEY GOING TO THE MOON  
TODAY?

1078

00:49:55,110 --> 00:50:00,000

AND THAT TEACHER WOULD SAY ARR,  
ARR AND THEY'D BE TEACHING

1079

00:50:00,000 --> 00:50:01,130

HISTORY OR ENGLISH.

1080

00:50:01,130 --> 00:50:06,619

I'D BE BORED AND STARE AT WHAT  
THEY'RE DOING IN SPACE.

1081

00:50:06,619 --> 00:50:09,990

IF YOU'RE ALWAYS INTERESTED IN

THAT, IT KEEPS THAT INTEREST

1082

00:50:09,990 --> 00:50:13,860

GOING.

1083

00:50:13,860 --> 00:50:15,111

THERE ARE SIX PEOPLE ON SPACE  
STATION TODAY.

1084

00:50:15,111 --> 00:50:18,860

AND THERE'S ALL KINDS OF FEEDS  
ON NASA WEBSITES THAT TALK ABOUT

1085

00:50:18,860 --> 00:50:20,750

WHAT TO DO ON THE STATION EVERY  
DAY.

1086

00:50:20,750 --> 00:50:23,310

SO THAT KIND OF INTEREST KEEPS  
THINGS GOING.

1087

00:50:23,310 --> 00:50:26,290

>> I KNOW YOU WANT TO GO BEYOND  
MATH AND SCIENCE, THEY NEED TO

1088

00:50:26,290 --> 00:50:30,099

WORK AS A TEAM AND LEARN HOW TO  
GET ALONG WITH OTHERS.

1089

00:50:30,099 --> 00:50:31,780

>> ABSOLUTELY.

1090

00:50:31,780 --> 00:50:33,830

ALL THESE TEAMS HERE, ALL THESE  
GROUPS THAT ARE WORKING WITH US

1091

00:50:33,830 --> 00:50:35,190

TODAY HAVE TEAMS.

1092

00:50:35,190 --> 00:50:39,930  
THEY'RE SMALLER TEAMS.  
50, 100, 200 PEOPLE.

1093  
00:50:39,930 --> 00:50:42,210  
NOT THOUSANDS BUT THEY  
DEFINITELY WORK AS A TEAM.

1094  
00:50:42,210 --> 00:50:46,400  
AND EVERY TEAM MEMBER IS PART OF  
THAT.

1095  
00:50:46,400 --> 00:50:49,300  
MY ORGANIZATION, I ALWAYS USE  
THE ANALOGY WE'RE ALL IN THE

1096  
00:50:49,300 --> 00:50:50,300  
BOAT TOGETHER.

1097  
00:50:50,300 --> 00:50:53,710  
AND IF ONE PERSON IS NOT DOING  
THEIR PART TO MAKE THE BOAT GO

1098  
00:50:53,710 --> 00:50:56,550  
FORWARD, THE BOAT'S NOT GOING TO  
GO FORWARD.

1099  
00:50:56,550 --> 00:50:58,210  
SO IT'S A TEAM EFFORT.

1100  
00:50:58,210 --> 00:50:59,210  
ANOTHER QUESTION?

1101  
00:50:59,210 --> 00:51:04,450  
>> DO YOU SEE ANY, I GUESS,  
PROBABLY MORE IN THE SHORT TERM

1102  
00:51:04,450 --> 00:51:12,010  
THAN THE LONG TERM LOSS OF THAT  
PUBLIC BENEFIT FROM MOVING TO A

1103

00:51:12,010 --> 00:51:18,570

LOT OF COMMERCIAL CARRIERS,  
MAYBE INsofar AS WHO OWNS

1104

00:51:18,570 --> 00:51:23,580

PARTICULAR RESEARCH OR, YOU  
KNOW, WHO OWNS PLACES THAT WE

1105

00:51:23,580 --> 00:51:25,650

MIGHT GO?

1106

00:51:25,650 --> 00:51:28,900

BEFORE IT'S ALWAYS BEEN A PUBLIC  
ENDEAVOR.

1107

00:51:28,900 --> 00:51:33,780

DO YOU SEE ANY CONFLICTS OF  
INTEREST THERE?

1108

00:51:33,780 --> 00:51:38,790

AND WHAT DO WE DO TO MAKE SURE  
THAT WE PROTECT THAT LEGACY?

1109

00:51:38,790 --> 00:51:41,390

>> THOSE ARE GOOD QUESTIONS.

1110

00:51:41,390 --> 00:51:42,390

LET'S SEE.

1111

00:51:42,390 --> 00:51:47,680

I WOULD SAY THAT, YOU KNOW, NASA  
WAS ABLE TO MAKE BIG HEADLINES

1112

00:51:47,680 --> 00:51:50,490

OUT OF SHUTTLE FLIGHTS BECAUSE  
EVERYONE WANTED TO WATCH WHAT

1113

00:51:50,490 --> 00:51:51,800

THE SHUTTLE WAS DOING.

1114

00:51:51,800 --> 00:51:54,780

IN THE FUTURE, WE WILL HAVE SOME  
OF THESE GUYS FLYING.

1115

00:51:54,780 --> 00:51:58,150

AND THEY'LL BE JUST AS BIG NOT  
ONLY FROM THE NASA SIDE BUT ALSO

1116

00:51:58,150 --> 00:52:00,900

THESE COMMERCIAL COMPANIES WILL  
BE ADVERTISING IT.

1117

00:52:00,900 --> 00:52:04,510

JUST LIKE SPACE X DOES TODAY FOR  
THEIR LAUNCH TOMORROW.

1118

00:52:04,510 --> 00:52:10,920

AND SO TO ME, IT FOLDS INTO  
GOING FROM AIRLINES TO SPACE

1119

00:52:10,920 --> 00:52:11,920

LINES.

1120

00:52:11,920 --> 00:52:14,470

I BELIEVE IN 20 OR 30 YEARS  
WE'LL HAVE SPACE LINES THAT ARE

1121

00:52:14,470 --> 00:52:17,950

GOING TO LOW-EARTH ORBIT AND  
MAYBE OTHER PLACES.

1122

00:52:17,950 --> 00:52:19,650

BUT GOING TO AT LEAST LOW-EARTH  
ORBIT.

1123

00:52:19,650 --> 00:52:24,410

AND THAT IS WHAT I ENVISION AS A  
NATION, IF WE CAN EMBODY THAT

1124

00:52:24,410 --> 00:52:27,700

AND SAY WE'RE GOING TO GO FROM  
AIRLINES TODAY TO SPACE LINES IN

1125

00:52:27,700 --> 00:52:31,070

20 OR 30 YEARS, THAT WOULD BE  
HUGE FOR THE COUNTRY.

1126

00:52:31,070 --> 00:52:33,880

AND THEN PEOPLE WILL THEN GRAB  
ON TO THAT INTEREST.

1127

00:52:33,880 --> 00:52:36,700

I THINK RIGHT NOW, IT'S A  
TRANSITION PERIOD.

1128

00:52:36,700 --> 00:52:39,650

SO WE JUST HAVE TO DEAL WITH THE  
TRANSITION PERIOD, MAKE SURE

1129

00:52:39,650 --> 00:52:43,400

WE'RE DOING WHAT WE CAN IN ORDER  
TO GET CAPABILITY BACK TO

1130

00:52:43,400 --> 00:52:47,460

LOW-EARTH ORBIT, AND THEN IT  
WILL TAKE OFF FROM THERE.

1131

00:52:47,460 --> 00:52:50,040

>> KIND OF BUILDING ON THE  
ANSWER FOR THE LAST QUESTION, I

1132

00:52:50,040 --> 00:52:52,400

HAVE A QUESTION FROM SOMEBODY ON  
TWITTER.

1133

00:52:52,400 --> 00:52:55,080

WHAT OBJECTIONS DO YOU SEE THE  
COMMERCIAL CREW UNDERTAKING ONCE

1134

00:52:55,080 --> 00:52:57,420

THE ISS MISSION IS COMPLETE?

1135

00:52:57,420 --> 00:53:02,119

>> LET'S SEE, FROM A COMMERCIAL  
CREW STANDPOINT FOR ISS, WE WILL

1136

00:53:02,119 --> 00:53:03,330

THEN MANAGE THAT PROGRAM.

1137

00:53:03,330 --> 00:53:07,330

IT WILL BE A LOT SMALLER THAN IT  
IS TODAY BECAUSE IT'S PAST

1138

00:53:07,330 --> 00:53:08,860

DEVELOPMENT.

1139

00:53:08,860 --> 00:53:10,680

AND WE'LL BE DOING THAT FOR ISS.

1140

00:53:10,680 --> 00:53:14,270

NOW, THE NEXT QUESTION IS IS CAN  
WE DO OTHER THINGS IN LOW-EARTH

1141

00:53:14,270 --> 00:53:17,200

ORBIT OUTSIDE OF ISS FOR NASA?

1142

00:53:17,200 --> 00:53:21,240

WE'LL HAVE TO SEE HOW THE NATION  
GOES IN THAT REGARD.

1143

00:53:21,240 --> 00:53:24,560

BUT WHAT I WOULD SAY FROM A  
COMMERCIAL CREW STANDPOINT, OUR

1144

00:53:24,560 --> 00:53:25,890

MISSION WILL BE NASA.

1145

00:53:25,890 --> 00:53:29,060

BUT BY ENGAGING AND EMBEDDING  
THIS CAPABILITY TO GO TO OTHER

1146

00:53:29,060 --> 00:53:33,220

PLACES, THEN THERE WILL BE OTHER  
MARKETS TO GO TO OTHER SPACE

1147

00:53:33,220 --> 00:53:35,390

STATIONS THAT WILL BE OUTSIDE OF  
NASA.

1148

00:53:35,390 --> 00:53:39,560

YOU KNOW, NASA SHOULD BE THE  
FUSE TO LIGHT A FIRE.

1149

00:53:39,560 --> 00:53:44,180

BUT ONCE THE FIRE IS GOING, THEN  
I THINK INDUSTRY AND THE NATION

1150

00:53:44,180 --> 00:53:45,350

WILL WANT TO KEEP THE FIRE  
GOING.

1151

00:53:45,350 --> 00:53:47,740

SO OUR GOAL IS TO GET THE FIRE  
STARTED.

1152

00:53:47,740 --> 00:53:49,500

>> AND JUST ONE MORE QUESTION.

1153

00:53:49,500 --> 00:53:51,950

USING THE ANALOGY OF EARLY  
UNITED STATES POSTAL OFFICE

1154

00:53:51,950 --> 00:53:54,600

AIRMAIL PILOTS WERE KILLED QUITE  
OFTEN.

1155

00:53:54,600 --> 00:53:56,950  
IT'S LIKE HOW DO WE GET OUR  
COUNTRY TO ACCEPT INHERENT RISKS

1156  
00:53:56,950 --> 00:53:59,099  
TO SPACE FLIGHT?

1157  
00:53:59,099 --> 00:54:03,200  
>> WELL, EVERYTHING YOU DO IN  
LIFE HAS GOT RISKS.

1158  
00:54:03,200 --> 00:54:06,500  
YOU DRIVING OFF THE CENTER HAS  
GOT RISKS.

1159  
00:54:06,500 --> 00:54:12,770  
BUT SOMEPLACE FLIGHT IS NOT FOR  
FREE FROM A RISK STANDPOINT.

1160  
00:54:12,770 --> 00:54:15,930  
AND EVEN TOMORROW'S LAUNCH IS A  
TEST FLIGHT AND WE'VE GOT TO

1161  
00:54:15,930 --> 00:54:17,850  
HIGHLIGHT THE FACT IT'S A TEST  
FLIGHT.

1162  
00:54:17,850 --> 00:54:20,520  
SO AS THE TEST FLIGHT HAS  
OBJECTIVES, YOU'RE TRYING TO

1163  
00:54:20,520 --> 00:54:23,410  
MEET THOSE OBJECTIVES, BUT IT'S  
MORE ABOUT GATHERING THE DATA AS

1164  
00:54:23,410 --> 00:54:26,490  
YOU'RE TRYING TO MEET THOSE  
OBJECTIVES THAN ANYTHING ELSE AS

1165  
00:54:26,490 --> 00:54:27,590

A TEST FLIGHT.

1166

00:54:27,590 --> 00:54:30,790

WHEN THEY FLY PEOPLE UNDER A  
COMMERCIAL CREW, WE WANT TO BE

1167

00:54:33,270 --> 00:54:31,790

SUCCESSFUL.

1168

00:54:33,270 --> 00:54:34,620

FAILURE IS NOT AN OPTION.

1169

00:54:34,620 --> 00:54:35,880

I LIKE THE BOOK.

1170

00:54:35,880 --> 00:54:39,240

AT THE SAME POINT, WE HAVE TO  
KNOW THAT THERE'S RISKS.

1171

00:54:39,240 --> 00:54:40,450

YOU'VE GOT TO MANAGE THOSE  
RISKS.

1172

00:54:40,450 --> 00:54:44,510

AND YOU MANAGE THOSE RISKS BY  
UNDERSTANDING WHAT THAT FAILURE

1173

00:54:44,510 --> 00:54:48,109

COULD BE AND WHAT THE LIKELIHOOD  
OF THAT FAILURE IS AND THEN

1174

00:54:48,109 --> 00:54:50,400

TRYING TO FIGURE OUT MITIGATIONS  
TO THAT FAILURE.

1175

00:54:50,400 --> 00:54:54,590

AND IF THE FAILURE IS SO LOW,  
PROBABILITY IS SO LOW, YOU MIGHT

1176

00:54:54,590 --> 00:54:55,700  
HAVE TO ACCEPT THAT.

1177  
00:54:55,700 --> 00:54:59,070  
AND THAT'S WHAT PROGRAM MANAGERS  
DO EVERY DAY.

1178  
00:54:59,070 --> 00:55:00,460  
THAT'S WHAT WE DID IN THE  
SHUTTLE PROGRAM.

1179  
00:55:00,460 --> 00:55:03,810  
THAT'S WHAT THEY DO ON STATION  
24/7.

1180  
00:55:03,810 --> 00:55:06,050  
THAT'S WHAT WE'LL DO ON THE  
COMMERCIAL CREW.

1181  
00:55:06,050 --> 00:55:07,510  
I HOPE THAT ANSWERED YOUR  
QUESTION.

1182  
00:55:07,510 --> 00:55:09,850  
THERE'S ALWAYS GOING TO BE  
RISKS.

1183  
00:55:09,850 --> 00:55:14,800  
AND EVERY MISSION BE 100%  
SUCCESSFUL, THAT'S THE GOAL, BUT

1184  
00:55:14,800 --> 00:55:16,210  
WE ARE HUMAN.

1185  
00:55:16,210 --> 00:55:20,170  
AND AS HUMANS, WE TRIP AND FALL  
ONCE IN A WHILE.

1186  
00:55:20,170 --> 00:55:23,750  
AND IF WE LEARN FROM THAT TRIP

AND FALL, THEN WE WILL BE BETTER

1187

00:55:23,750 --> 00:55:27,220

THE NEXT PART OF THE PATH.

1188

00:55:27,220 --> 00:55:28,220

>> HI.

1189

00:55:28,220 --> 00:55:30,530

I WANTED TO ACTUALLY AMPLIFY  
THAT AND SAY SOMETHING POSITIVE.

1190

00:55:30,530 --> 00:55:32,110

I HELPED MY FATHER BUILD AN  
AIRPLANE.

1191

00:55:32,110 --> 00:55:34,100

AND WE BOTH HAVE FLOWN IN IT.

1192

00:55:34,100 --> 00:55:37,150

AND ONE OF THE THINGS WE DO,  
GREW UP ON A FARM, BECAME A

1193

00:55:37,150 --> 00:55:38,150

NUCLEAR ENGINEER.

1194

00:55:38,150 --> 00:55:40,440

WE BUILT SAFETY IN, AND THAT  
SEEMED TO BE THE PROCESS.

1195

00:55:40,440 --> 00:55:43,609

INSTEAD OF LOOKING AT THE RISK,  
WE JUST LOOKED AT HOW DO WE

1196

00:55:43,609 --> 00:55:45,369

BUILD MORE SAFETY INTO THE  
AIRCRAFT.

1197

00:55:45,369 --> 00:55:48,359

THERE WERE AREAS I REMEMBER HIM  
TALKING ABOUT HE OVERDESIGNED

1198

00:55:48,359 --> 00:55:51,860

BECAUSE HE WANTED TO JUST BUILD  
IN A LITTLE MORE SAFETY.

1199

00:55:51,860 --> 00:55:53,520

>> THAT'S EXACTLY WHAT WE DO.

1200

00:55:53,520 --> 00:55:55,670

THAT'S EXACTLY WHAT WE'LL DO  
WITH OUR PARTNERS.

1201

00:55:55,670 --> 00:56:01,470

SOME OF THE SYSTEMS ARE SO  
CRITICAL FOR US, WE NEED TO HAVE

1202

00:56:01,470 --> 00:56:05,080

TWO LEVELS OF REDUNDANCY BEFORE  
WE'RE WILLING TO BUY INTO THAT

1203

00:56:05,080 --> 00:56:06,080

KIND OF SYSTEM.

1204

00:56:06,080 --> 00:56:08,360

IN ONE SYSTEM FAILS, YOU STILL  
HAVE ANOTHER ONE.

1205

00:56:08,360 --> 00:56:10,859

YOU CAN'T JUST GET OFF TO THE  
SIDE OF THE ROAD LIKE YOU WOULD

1206

00:56:10,859 --> 00:56:11,859

IN A CAR.

1207

00:56:11,859 --> 00:56:14,900

WE PUT THOSE THINGS INTO THE  
DESIGN.

1208

00:56:14,900 --> 00:56:17,830

AND YOU TRY TO CERTIFY IT TO  
THAT KIND OF LEVEL.

1209

00:56:17,830 --> 00:56:20,350

BUT EVEN WITH ALL THE BEST  
CERTIFICATION IN THE WORLD, IT

1210

00:56:20,350 --> 00:56:24,570

IS STILL A SYSTEM MADE BY HUMANS  
TO OPERATE IN AN ENVIRONMENT

1211

00:56:24,570 --> 00:56:29,190

THAT'S VERY HARSH.

1212

00:56:29,190 --> 00:56:33,310

>> MORE QUESTIONS?

1213

00:56:33,310 --> 00:56:35,370

NO?

1214

00:56:35,370 --> 00:56:38,710

>> WHAT DO YOU SEE IS THE NEXT  
STEP -- RIGHT NOW WE'RE WORKING

1215

00:56:38,710 --> 00:56:39,710

IN LOW-EARTH ORBIT MOSTLY.

1216

00:56:39,710 --> 00:56:41,690

WHAT DO YOU SEE AS THE NEXT  
AFTER THAT?

1217

00:56:41,690 --> 00:56:43,250

DO WE GO TO THE MOON?

1218

00:56:43,250 --> 00:56:44,250

MARS?

1219

00:56:44,250 --> 00:56:46,390  
OR SOMEWHERE IN BETWEEN?

1220

00:56:46,390 --> 00:56:51,330  
>> WELL, I THINK FROM A NASA  
STANDPOINT, WE ARE MAKING

1221

00:56:51,330 --> 00:56:55,140  
SYSTEMS, AND I'M NOT SURE IF THE  
SLS OR ORION GUYS ARE TALKING

1222

00:56:55,140 --> 00:56:56,140  
TODAY.

1223

00:56:56,140 --> 00:56:59,250  
BUT THAT IS THE SYSTEM BEYOND  
LOW-EARTH ORBIT.

1224

00:56:59,250 --> 00:57:02,150  
NONE OF THESE SYSTEMS WILL GET  
US BEYOND.

1225

00:57:02,150 --> 00:57:03,340  
THEY DON'T HAVE THE ENERGY.

1226

00:57:03,340 --> 00:57:04,740  
IT'S ALL ABOUT ENERGY.

1227

00:57:04,740 --> 00:57:07,910  
THEY DON'T HAVE THE ENERGY TO  
GET THROUGH THE PHYSICS TO GET

1228

00:57:07,910 --> 00:57:12,460  
OUTSIDE OF LOW-EARTH ORBIT AND  
GO TO THE MOON TO DESTROYED OR

1229

00:57:12,460 --> 00:57:14,420  
L-2 OR MARS OR ANYWHERE ELSE  
LIKE THAT.

1230

00:57:14,420 --> 00:57:16,950

I THINK WHAT WE HAVE TO DO THEN  
IS FIGURE OUT WHAT DOES IT TAKE

1231

00:57:16,950 --> 00:57:21,600

TO LIVE OUTSIDE THE EARTH,  
OUTSIDE THE LOW-EARTH ORBIT FOR

1232

00:57:21,600 --> 00:57:22,670

A VERY LONG PERIOD OF TIME.

1233

00:57:22,670 --> 00:57:25,160

HOW DO YOU DO THE LOGISTICS?

1234

00:57:25,160 --> 00:57:28,450

I THINK WE'LL BE FIGURING THAT  
OUT OVER THE NEXT TEN YEARS.

1235

00:57:28,450 --> 00:57:31,890

THEN WE FIGURE OUT BASED ON THAT  
LOGISTICAL MODEL OF HOW DO YOU

1236

00:57:31,890 --> 00:57:36,450

GET HARDWARE, CREWS TO SURVIVE  
THAT LONG, THEN WE CAN FIGURE

1237

00:57:36,450 --> 00:57:38,460

OUT WHERE'S THE RIGHT PLACE TO  
GO?

1238

00:57:38,460 --> 00:57:41,820

IN THE END, I THINK WE WANT TO  
VISIT ALL THOSE PLACES AGAIN.

1239

00:57:41,820 --> 00:57:45,270

FOR ME, IT'S ALL ABOUT VISITING  
ALL THOSE PLACES TO FIGURE OUT

1240

00:57:45,270 --> 00:57:48,090

WHAT IT MEANS BACK ON EARTH.

1241

00:57:48,090 --> 00:57:49,350

GOING TO THE MOON.

1242

00:57:49,350 --> 00:57:50,350

BE GREAT.

1243

00:57:50,350 --> 00:57:52,630

WHAT DOES IT MEAN ABOUT WHAT OUR  
LIFE IS BACK ON EARTH?

1244

00:57:52,630 --> 00:57:57,550

GOING TO A PLACE LIKE AN L-2  
LOCATION, WHAT DOES THAT MEAN?

1245

00:57:57,550 --> 00:58:00,100

WELL, MAYBE THAT'S A PLACE WE  
CAN LEARN HOW TO DO THINGS SO WE

1246

00:58:00,100 --> 00:58:03,440

CAN GO FURTHER SO WE CAN LEARN  
ALL ABOUT EARTH.

1247

00:58:03,440 --> 00:58:05,450

AND THE SAME THING WITH MARS.

1248

00:58:05,450 --> 00:58:06,790

ALL THOSE TRIPS ARE HARD.

1249

00:58:06,790 --> 00:58:11,300

PUTTING PEOPLE IN SPACE IS VERY,  
VERY HARD.

1250

00:58:11,300 --> 00:58:13,630

WHAT SPACE X IS GOING TO DO  
TOMORROW IS VERY HARD.

1251

00:58:13,630 --> 00:58:17,040

PUTTING PEOPLE ON BOARD SOMEDAY  
IS EVEN HARDER.

1252

00:58:17,040 --> 00:58:20,030  
NOW GO OUT TO LOW-EARTH ORBIT  
AND TRY TO COME BACK SAFELY IS

1253

00:58:20,030 --> 00:58:21,590  
EVEN THAT MUCH MORE HARD.

1254

00:58:21,590 --> 00:58:28,360  
THAT'S WHY NASA DOES THE HARD  
THINGS WHICH I'M HAPPY TO BE

1255

00:58:28,360 --> 00:58:31,940  
PART OF.

1256

00:58:31,940 --> 00:58:35,280  
>> WITH THE CHINESE GOVERNMENT  
STATING THAT THEIR INTENTION IS

1257

00:58:35,280 --> 00:58:38,500  
TO ESTABLISH A COLONY ON THE  
MOON, DO YOU THINK THAT'S GOING

1258

00:58:38,500 --> 00:58:44,730  
TO SPUR OUR EFFORTS TO EITHER DO  
THE SAME OR, YOU KNOW, LEAPFROG

1259

00:58:44,730 --> 00:58:46,410  
OVER THEM TO GO TO MARS?

1260

00:58:46,410 --> 00:58:49,740  
BECAUSE IF THEY DO, THAT KIND OF  
GIVES THE MILITARY HIGH

1261

00:58:49,740 --> 00:58:51,150  
POSITION, DOESN'T IT?

1262

00:58:51,150 --> 00:58:56,190  
>> I DON'T KNOW IF I CAN EVEN  
ANSWER THAT QUESTION.

1263  
00:58:56,190 --> 00:58:58,320  
I'M TRYING TO FIGURE OUT HOW TO  
GET TO LOW-EARTH ORBIT WITH OUR

1264  
00:58:58,320 --> 00:59:01,670  
ASTRONAUTS.

1265  
00:59:01,670 --> 00:59:05,770  
AND IF ANOTHER COUNTRY WANTS TO  
GO, OKAY.

1266  
00:59:05,770 --> 00:59:13,070  
GEE, I THINK ONE MORE HERE,  
MAYBE.

1267  
00:59:13,070 --> 00:59:14,980  
>> SPEAKING OF JUST BEING IN  
LOW-EARTH ORBIT WITH THIS

1268  
00:59:14,980 --> 00:59:18,210  
PROGRAM, DO YOU SEE THIS PROGRAM  
EXPANDING TO INCLUDE THESE

1269  
00:59:18,210 --> 00:59:21,520  
COMPANIES AND GOING TO MARS OR  
TO AN ASTEROID OR TO L-2?

1270  
00:59:21,520 --> 00:59:25,420  
>> GOOD QUESTION.

1271  
00:59:25,420 --> 00:59:29,200  
THESE ROCKETS WITH THESE SYSTEMS  
WILL NOT BE ABLE TO GO BEYOND

1272  
00:59:29,200 --> 00:59:30,200  
LOW-EARTH ORBIT.

1273

00:59:30,200 --> 00:59:33,070

NOW, IF THESE PARTICULAR  
COMPANIES WANT TO GO COMPETE AND

1274

00:59:33,070 --> 00:59:37,750

DO OTHER THINGS, MODIFY THEIR  
VEHICLES, MODIFY THEIR

1275

00:59:37,750 --> 00:59:41,090

SPACECRAFT, WORK WITH OTHER  
COMPANIES THAT HAVE BIGGER

1276

00:59:41,090 --> 00:59:45,910

ROCKETS, BE A PART OF THE SLS,  
ORION PICTURE IN THE FUTURE,

1277

00:59:45,910 --> 00:59:46,910

ABSOLUTELY.

1278

00:59:46,910 --> 00:59:49,500

THEY CAN CERTAINLY COMPETE FOR  
THOSE KIND OF OPPORTUNITIES AND

1279

00:59:49,500 --> 00:59:50,830

DO THOSE KIND OF THINGS.

1280

00:59:50,830 --> 00:59:53,160

THESE ROCKETS DON'T HAVE ENOUGH  
ENERGY TO GET BEYOND LOW-EARTH

1281

00:59:53,160 --> 00:59:56,270

ORBIT, AND THEY WERE NEVER  
DESIGNED TO DO THAT.

1282

00:59:56,270 --> 01:00:03,100

AGAIN, THIS IS ABOUT -- SOMEONE  
ASKED ME, YOU KNOW, THIS IS WHAT

1283

01:00:03,100 --> 01:00:04,350  
IT TAKES TO GET TO LOW-EARTH  
ORBIT.

1284  
01:00:04,350 --> 01:00:06,130  
I HAVE A LITTLE MINI.

1285  
01:00:06,130 --> 01:00:08,080  
MY CAR I DRIVE IS A MINI.

1286  
01:00:08,080 --> 01:00:11,390  
AND SO IT GOES FROM POINT A TO  
POINT B.

1287  
01:00:11,390 --> 01:00:14,180  
IF I WANT TO GO A LONG-DISTANCE,  
I PROBABLY DON'T WANT TO TAKE MY

1288  
01:00:14,180 --> 01:00:15,180  
MINI.

1289  
01:00:15,180 --> 01:00:16,700  
I'D PROBABLY RATHER TAKE ANOTHER  
CAR.

1290  
01:00:16,700 --> 01:00:19,460  
THAT'S THE DIFFERENCE BETWEEN  
LOW-EARTH ORBIT AND WHAT WE WANT

1291  
01:00:19,460 --> 01:00:24,430  
TO DO WHEN WE GO EXPLORE.

1292  
01:00:24,430 --> 01:00:27,700  
>> THE QUESTION WAS WOULD NASA  
HELP FUND IT?

1293  
01:00:27,700 --> 01:00:31,941  
>> SEE, AGAIN, FOR EXPLORATION,  
BEYOND LOW-EARTH ORBIT, RIGHT

1294

01:00:31,941 --> 01:00:38,590

NOW, THAT'S THROUGH SLS AND MPCV  
AND EXPLORATION GROUP WITHIN

1295

01:00:38,590 --> 01:00:39,590

NASA.

1296

01:00:39,590 --> 01:00:42,609

AND SO HOW THEY ARE MANAGING ALL  
THAT, I'M SURE THEY CAN COMPETE.

1297

01:00:42,609 --> 01:00:45,220

AND I'M SURE THEY ARE COMPETING  
IF THEY WOULD LIKE TO.

1298

01:00:45,220 --> 01:00:46,220

>> THANKS, ED.

1299

01:00:46,220 --> 01:00:48,760

UNFORTUNATELY, WE DON'T HAVE  
TIME FOR ME MORE QUESTIONS.

1300

01:00:48,760 --> 01:00:53,930

THANKS FOR JOINING US.

1301

01:00:53,930 --> 01:01:03,450

>> THANK YOU.

1302

01:01:03,450 --> 01:01:05,250

>> STARTED OFF THERE WERE NO  
QUESTIONS.

1303

01:01:05,250 --> 01:01:06,730

BEGGING YOU FOR QUESTIONS.

1304

01:01:06,730 --> 01:01:11,790

THEN I COULDN'T STOP YOU GUYS.

1305

01:01:11,790 --> 01:01:14,730  
THANKS TO THE TEACHER.

1306  
01:01:14,730 --> 01:01:17,410  
GREAT.

1307  
01:01:17,410 --> 01:01:20,410  
I THINK THIS IS GOING TO BE A  
LONG DAY IF WE KEEP GIVING THE

1308  
01:01:20,410 --> 01:01:21,990  
MICROPHONE TO THE TEACHER.

1309  
01:01:21,990 --> 01:01:26,250  
OUR NEXT SPEAKER IS SCOTT, THE  
CHIEF ARCHITECT FOR THE GROUNDS

1310  
01:01:26,250 --> 01:01:28,770  
DEVELOPMENT AND OPERATIONS  
PROGRAM.

1311  
01:01:28,770 --> 01:01:34,829  
AND I WANT TO WELCOME SCOTT.

1312  
01:01:34,829 --> 01:01:37,109  
>> THANK YOU.

1313  
01:01:37,109 --> 01:01:40,359  
I'M HOPING I CAN PULL THIS OVER  
JUST TO HAVE A LITTLE VISUAL

1314  
01:01:40,359 --> 01:01:41,359  
AID.

1315  
01:01:41,359 --> 01:01:42,359  
IS THAT GOING TO BE A PROBLEM  
FOR YOU?

1316  
01:01:42,359 --> 01:01:47,620

YOU GOOD?

1317

01:01:47,620 --> 01:01:52,350  
RIGHT IN FRONT OF YOUR CAMERA.

1318

01:01:52,350 --> 01:01:54,250  
KEEP GOING.

1319

01:01:54,250 --> 01:01:55,250  
>> THIS IS OUR CLASSIFIED.

1320

01:01:55,250 --> 01:01:57,890  
SO I DIDN'T WANT YOU TO BE ABLE  
TO SEE ANYTHING.

1321

01:01:57,890 --> 01:01:58,890  
OKAY.

1322

01:01:58,890 --> 01:02:00,710  
I'VE HEARD PART OF THE  
INTRODUCTION.

1323

01:02:00,710 --> 01:02:01,900  
MY NAME IS SCOTT COLORADO.

1324

01:02:01,900 --> 01:02:05,270  
WE ARE WORKING ON WHAT IS BEING  
CALLED THE GROUNDS SYSTEMS

1325

01:02:05,270 --> 01:02:08,180  
DEVELOPMENT AND OPERATIONS  
PROGRAM.

1326

01:02:08,180 --> 01:02:09,700  
KIND OF ROLLS RIGHT OFF THE  
TONGUE.

1327

01:02:09,700 --> 01:02:12,099  
YOU KNOW, A BUNCH OF WORDS

THERE.

1328

01:02:12,099 --> 01:02:16,599

OUR ACRONYM WE'RE REQUIRED TO  
HAVE IS GSDO.

1329

01:02:16,599 --> 01:02:20,450

WHAT WE DO HERE IS WE'RE  
ASSIGNED TO -- WE'RE THE PROGRAM

1330

01:02:20,450 --> 01:02:23,830

THAT WILL ESSENTIALLY CONVERT  
KENNEDY SPACE CENTER FROM WHAT

1331

01:02:23,830 --> 01:02:26,990

IT'S BEEN DOING THE LAST 30  
YEARS OR SO IN THE SPACE SHUTTLE

1332

01:02:26,990 --> 01:02:29,240

PROGRAM TO WHAT WE'RE GOING TO  
BE DOING NEXT.

1333

01:02:29,240 --> 01:02:32,740

I THINK A LOT OF YOUR QUESTIONS  
BEFORE WERE ABOUT, YOU KNOW,

1334

01:02:32,740 --> 01:02:35,700

WHERE WE'RE GOING AND BEYOND  
LOW-EARTH ORBIT WHICH IS WHAT

1335

01:02:35,700 --> 01:02:38,640

ED'S WORKING ON IN THE  
COMMERCIAL CREW PROGRAM.

1336

01:02:38,640 --> 01:02:40,570

AND MAYBE I CAN HELP A LITTLE  
BIT THERE.

1337

01:02:40,570 --> 01:02:41,990

I'LL DO MY BEST.

1338

01:02:41,990 --> 01:02:45,049

A BIG PART OF WHAT WE'RE DOING  
TODAY -- AND BY THE WAY, I AM

1339

01:02:45,049 --> 01:02:46,260

WEARING JEANS AND CASUAL.

1340

01:02:46,260 --> 01:02:50,020

THIS IS STANDARD DRESS CODE FOR  
ENGINEERS ON FRIDAY.

1341

01:02:50,020 --> 01:02:51,990

SO I DIDN'T DRESS UP FOR Y'ALL.

1342

01:02:51,990 --> 01:02:54,570

IT'S LIKE A DENIM FACTORY OUT  
HERE ON FRIDAY.

1343

01:02:54,570 --> 01:02:57,520

YOU KNOW, I APPRECIATE Y'ALL  
BEING CASUAL AS WELL.

1344

01:02:57,520 --> 01:02:59,920

I TRIED TO MATCH UP.

1345

01:02:59,920 --> 01:03:01,790

BUT TO TELL YOU A LITTLE BIT  
ABOUT WHAT WE'RE DOING, I KNOW A

1346

01:03:01,790 --> 01:03:02,980

LOT OF YOU HAVEN'T BEEN HERE  
TODAY.

1347

01:03:02,980 --> 01:03:06,480

I HEAR YOU'RE GOING TO GO ON A  
TOUR LATER TODAY, WHICH YOU'LL

1348

01:03:06,480 --> 01:03:09,609

NEVER FORGET IT, I CAN ASSURE  
YOU COMING OUT HERE TO THE

1349

01:03:09,609 --> 01:03:12,960

LAUNCH PADS AND KENNEDY SPACE  
CENTER IN GENERAL, A THRILL OF A

1350

01:03:12,960 --> 01:03:13,960

LIFETIME.

1351

01:03:13,960 --> 01:03:15,099

YOU'LL NEVER FORGET IT.

1352

01:03:15,099 --> 01:03:16,970

HOPEFULLY I DON'T OVERSELL THAT.

1353

01:03:16,970 --> 01:03:20,300

TO TELL YOU A LITTLE BIT ABOUT  
WHAT YOU'LL SEE JUST TO START

1354

01:03:20,300 --> 01:03:22,580

OFF, FOR EXAMPLE, INSIDE THE  
VAB, THIS IS KIND OF A NICE

1355

01:03:22,580 --> 01:03:25,980

VISUAL HERE TO SHOW YOU WHAT  
WE'LL BE LOOKING AT DOWN THE

1356

01:03:25,980 --> 01:03:26,980

ROAD.

1357

01:03:26,980 --> 01:03:27,980

IT'S ABOUT FOUR OR FIVE YEARS  
FROM NOW.

1358

01:03:27,980 --> 01:03:31,400

2017, WE'RE GOING TO BE  
LAUNCHING THE -- YEAH, I'M SORRY

1359

01:03:31,400 --> 01:03:32,980  
IT'S NOT ANY SOONER THAN THAT.

1360  
01:03:32,980 --> 01:03:34,820  
GOT SOME WORK AHEAD OF US.

1361  
01:03:34,820 --> 01:03:38,230  
AND YOU'LL SEE THIS TODAY WHERE  
WE'VE GOT A LOT OF WORK TO DO

1362  
01:03:38,230 --> 01:03:39,710  
BETWEEN NOW AND THEN.

1363  
01:03:39,710 --> 01:03:41,980  
BUT ONE EXAMPLE OF THE THING WE  
HAVE TO DO, WE HAVE TO PROVIDE A

1364  
01:03:41,980 --> 01:03:44,770  
PLACE TO PUT TOGETHER THE ROCKET  
WHICH IS WHAT YOU SEE HERE.

1365  
01:03:44,770 --> 01:03:46,200  
THIS IS THE SPACE LAUNCH SYSTEM.

1366  
01:03:46,200 --> 01:03:51,440  
THE FIRST EXAMPLE OF THAT WITH  
THE MPCV, THE MULTIPURPOSE CREW

1367  
01:03:51,440 --> 01:03:56,130  
VEHICLE OR THE ORION PROGRAM IS  
PROVIDING THE CAPSULE AND THE

1368  
01:03:56,130 --> 01:04:00,430  
LAUNCH SYSTEM TO TAKE CARE OF  
THE CREW.

1369  
01:04:00,430 --> 01:04:03,560  
OUR JOB -- AND THERE'S REALLY  
THREE PROGRAMS WORKING HAND IN

1370  
01:04:03,560 --> 01:04:04,560  
HAND.

1371  
01:04:04,560 --> 01:04:06,609  
THERE'S THE ORION PROGRAM WHICH  
IS THE SPACECRAFT.

1372  
01:04:06,609 --> 01:04:09,160  
THERE'S THE SPACE LAUNCH SYSTEM,  
THE ROCKET WHICH IS THE ROCKET

1373  
01:04:09,160 --> 01:04:10,580  
GETS IT OFF THE GROUND.

1374  
01:04:10,580 --> 01:04:12,450  
WE'RE BASICALLY DOING EVERYTHING  
ELSE.

1375  
01:04:12,450 --> 01:04:15,540  
THE GROUND SYSTEMS, DEVELOPMENT  
OPERATIONS PROGRAM IS

1376  
01:04:15,540 --> 01:04:17,780  
RESPONSIBLE FOR BUILDING THE  
INFRASTRUCTURE HERE ON THE

1377  
01:04:17,780 --> 01:04:21,630  
GROUND THAT GETS THIS ROCKET PUT  
TOGETHER AND LAUNCHED.

1378  
01:04:21,630 --> 01:04:24,720  
SO IN THE VAB, FOR EXAMPLE, WHAT  
YOU SEE HERE IS SOMETHING, THE

1379  
01:04:24,720 --> 01:04:28,430  
BIG STRUCTURE WHICH I THINK  
YOU'LL SEE TODAY OUTSIDE OF THE

1380  
01:04:28,430 --> 01:04:31,061

VAB, THIS BIG STRUCTURE IS  
SIMILAR TO A MOBILE LAUNCH

1381

01:04:31,061 --> 01:04:32,061  
PLATFORM.

1382

01:04:32,061 --> 01:04:34,270  
IF YOU'VE SEEN THAT ON SHUTTLE,  
IT'S WHERE YOU BUILD UP THE

1383

01:04:34,270 --> 01:04:35,840  
ROCKET, THE CRAWLER.

1384

01:04:35,840 --> 01:04:38,210  
YOU'VE HEARD ABOUT THE CRAWLER,  
THE BIG MASSIVE CRAWLER.

1385

01:04:38,210 --> 01:04:40,830  
IT PICKS IT UP, CARRIES IT OUT  
TO THE PAD.

1386

01:04:40,830 --> 01:04:43,530  
THAT'S WHAT BASICALLY THIS  
MOBILE LAUNCHER STRUCTURE, YOU

1387

01:04:43,530 --> 01:04:46,780  
SEE THE TOWER AND THIS GRAY  
STRUCTURE BELOW IT, THE BASE, IT

1388

01:04:46,780 --> 01:04:49,020  
WILL BE TAKEN TO THE PAD.

1389

01:04:49,020 --> 01:04:52,400  
INSIDE THE VAB, THE CHALLENGE  
THERE IS TO CONVERT IT.

1390

01:04:52,400 --> 01:04:56,000  
TODAY WHAT YOU'LL SEE IN BASE  
THREE AND ONE IF YOU GET IN

1391

01:04:56,000 --> 01:04:59,120

THERE OR ESSENTIALLY DESIGNED  
AROUND THE SPACE SHUTTLE

1392

01:04:59,120 --> 01:05:00,120

PROGRAM.

1393

01:05:00,120 --> 01:05:03,050

IT'S WHAT WE CALL A SIDE MOUNT  
CONFIGURATION WHERE THE SHUTTLE

1394

01:05:03,050 --> 01:05:06,660

WAS MOUNTED TO THE SIDE OF THE  
ROCKET.

1395

01:05:06,660 --> 01:05:08,960

HERE IT'S WHAT WE CALL AN INLINE  
CONFIGURATION.

1396

01:05:08,960 --> 01:05:11,910

SO IT'S A DIFFERENT GEOMETRY TO  
WORK WITH AND REQUIRES A

1397

01:05:11,910 --> 01:05:15,050

DIFFERENT SET OF ACCESS  
PLATFORMS TO GET TO IT AS WELL

1398

01:05:15,050 --> 01:05:19,349

AS NEW GSE GROUNDS SUPPORT  
EQUIPMENT AND OTHER SERVICES TO

1399

01:05:19,349 --> 01:05:21,570

PUT THE ROCKET TOGETHER.

1400

01:05:21,570 --> 01:05:24,110

SO THAT'S KIND OF ONE BIG THING  
THAT WE'RE WORKING ON IS THE

1401

01:05:24,110 --> 01:05:25,170

VAB.

1402

01:05:25,170 --> 01:05:26,620

THERE'S FOUR HIGH BAYS IN THERE.

1403

01:05:26,620 --> 01:05:31,551

WE'RE MODIFYING BAY THREE TO  
SUPPORT THE SLS.

1404

01:05:31,551 --> 01:05:34,870

AND WE ALSO, A BIG PART OF WHAT  
WE'RE ALSO TRYING TO DO THAT

1405

01:05:34,870 --> 01:05:38,270

HASN'T BEEN DONE SO MUCH IN THE  
PAST IS ACCOUNT FOR OTHER

1406

01:05:38,270 --> 01:05:40,060

ROCKETS THAT MIGHT COME THROUGH  
KENNEDY.

1407

01:05:40,060 --> 01:05:42,890

FOR EXAMPLE, WHAT ED JUST TALKED  
ABOUT, THE COMMERCIAL CREW

1408

01:05:42,890 --> 01:05:45,660

ROCKETS, WE'RE OFFERING UP  
KENNEDY SPACE CENTER AS A

1409

01:05:45,660 --> 01:05:46,750

SERVICE TO THEM.

1410

01:05:46,750 --> 01:05:49,400

AND THEY MAY ELECT TO COME AND  
LAUNCH OUT OF HERE DEPENDING ON

1411

01:05:49,400 --> 01:05:53,840

WHO -- OR THE CONTRACTORS  
SELECTED FOR THAT.

1412

01:05:53,840 --> 01:05:57,060

AND WE'RE ALSO MODIFYING PAD B,  
39B JUST TO KIND OF COVER THE

1413

01:05:57,060 --> 01:05:58,340

GAMUT OF IT.

1414

01:05:58,340 --> 01:06:01,410

A BIG THING YOU'LL SEE TODAY IF  
YOU DRIVE -- I THINK THEY'RE

1415

01:06:01,410 --> 01:06:03,790

GOING TO GO OUT THAT WAY, RIGHT?

1416

01:06:03,790 --> 01:06:06,491

WHAT YOU'LL SEE IS A CONVERSION  
OF THAT LAUNCH PAD FROM A

1417

01:06:06,491 --> 01:06:10,520

SHUTTLE CONFIGURATION DESIGNED  
TO LAUNCH A SPACE SHUTTLE TO

1418

01:06:10,520 --> 01:06:12,020

WHATEVER WE MAY LAUNCH DOWN THE  
ROAD.

1419

01:06:12,020 --> 01:06:15,180

AND A BIG PART OF THAT IS WHAT  
WE CALL A CLEAN PAD CONCEPT.

1420

01:06:15,180 --> 01:06:17,000

SOME OF YOU MAY BE ABLE TO SEE  
IT.

1421

01:06:17,000 --> 01:06:20,930

ESSENTIALLY THE PAD IS CLEAN AND  
AS GENERIC AS POSSIBLE SO THAT

1422

01:06:20,930 --> 01:06:23,510

VIRTUALLY ANY ROCKET COULD  
LAUNCH FROM THAT LAUNCH PAD

1423

01:06:23,510 --> 01:06:25,320  
INCLUDING THE SPACE LAUNCH  
SYSTEM.

1424

01:06:25,320 --> 01:06:29,160  
AND THEN THE OTHER THING I THINK  
IF THEY GO IN THE VAB, YOU'LL

1425

01:06:29,160 --> 01:06:33,500  
HOPEFULLY SEE ONE OF THE  
CRAWLERS IN THERE IN HIGH BAY 2.

1426

01:06:33,500 --> 01:06:37,600  
ONE OF OUR CRAWLERS IS BEING  
UPGRADED FROM A LOWER CAPACITY

1427

01:06:37,600 --> 01:06:39,951  
WHAT WAS REQUIRED FOR SHUTTLE TO  
A BIGGER CAPACITY FOR THE SPACE

1428

01:06:39,951 --> 01:06:41,760  
LAUNCH SYSTEM.

1429

01:06:41,760 --> 01:06:46,870  
JUST A FUN FACT, TO CARRY THE  
SHUTTLE OUT TO THE LAUNCH PAD IS

1430

01:06:46,870 --> 01:06:49,100  
ROUGHLY ABOUT 12 MILLION POUNDS  
TO CARRY IT.

1431

01:06:49,100 --> 01:06:50,920  
SO IT'S A PRETTY MASSIVE SIZE.

1432

01:06:50,920 --> 01:06:52,280  
WE NEED MORE THAN THAT FOR THIS.

1433

01:06:52,280 --> 01:06:54,671

WE'RE THINKING IN THE  
NEIGHBORHOOD OF ABOUT 18 MILLION

1434

01:06:54,671 --> 01:06:55,671

POUNDS.

1435

01:06:55,671 --> 01:06:57,920

SO WE'RE UPGRADING THAT CRAWLER  
TO PICK THAT UP.

1436

01:06:57,920 --> 01:07:00,960

AND CRAWLER ITSELF WEIGHS ABOUT  
5.5 MILLION POUNDS.

1437

01:07:00,960 --> 01:07:04,150

SO THAT TOTAL STACK GOING TO THE  
PAD WILL BE 20-PLUS MILLION

1438

01:07:04,150 --> 01:07:05,150

POUNDS.

1439

01:07:05,150 --> 01:07:06,940

A LOT OF SCHOOL BUSES.

1440

01:07:06,940 --> 01:07:09,609

I MEANT TO CALCULATE THAT, HOW  
MANY SCHOOL BUSES IS SO Y'ALL

1441

01:07:09,609 --> 01:07:11,270

COULD QUOTE IT BUT I TOTALLY  
FORGOT.

1442

01:07:11,270 --> 01:07:15,560

IF SOMEBODY COULD GOOGLE WHAT A  
SCHOOL BUS WEIGHS AND DIVIDE

1443

01:07:15,560 --> 01:07:19,599

THAT BY 23 MILLION OR SO, THAT

WOULD BE VERY HELPFUL.

1444

01:07:19,599 --> 01:07:21,480

I JUST DIDN'T GET TIME TO DO IT.

1445

01:07:21,480 --> 01:07:25,730

CAN'T DO IT IN MY HEAD.

1446

01:07:25,730 --> 01:07:27,790

WE ARE FOCUSED ON SLS.

1447

01:07:27,790 --> 01:07:32,010

I HEARD A LOT OF QUESTIONS  
BEYOND LOW-EARTH ORBIT WHICH IS

1448

01:07:32,010 --> 01:07:34,109

A BIG THING WE'RE DOING.

1449

01:07:34,109 --> 01:07:37,911

A LOT OF YOUR QUESTIONS, I  
THINK, HAD TO DO WITH WHERE ARE

1450

01:07:37,911 --> 01:07:40,890

WE GOING TO GO AND WHAT ARE WE  
GOING TO DO WHEN WE GET THERE?

1451

01:07:40,890 --> 01:07:42,220

I CAN TELL YOU ONE THING.

1452

01:07:42,220 --> 01:07:45,441

OUR BIG FOCUS NOW IS ESSENTIALLY  
PROVIDING THE CAPABILITIES TO GO

1453

01:07:45,441 --> 01:07:47,110

JUST ABOUT ANYWHERE.

1454

01:07:47,110 --> 01:07:49,680

AND THERE'S BASICALLY THREE  
CAPABILITIES IN A NUTSHELL THAT

1455

01:07:49,680 --> 01:07:53,040

YOU NEED IS THE ORION  
SPACECRAFT, A DEEP SPACE

1456

01:07:53,040 --> 01:07:56,920

SPACECRAFT WHICH YOU DON'T GET  
FROM LOW-EARTH ORBIT STATION

1457

01:07:56,920 --> 01:07:58,010

THAT ED TALKED ABOUT.

1458

01:07:58,010 --> 01:08:01,030

YOU NEED SOMETHING TO GO WAY OUT  
THERE AND COME BACK AT A HIGH

1459

01:08:01,030 --> 01:08:04,740

SPEED SO EVERYTHING IS A LITTLE  
MORE CHALLENGING FROM THAT

1460

01:08:04,740 --> 01:08:07,390

PERSPECTIVE FOR PROTECTING THE  
CREW.

1461

01:08:07,390 --> 01:08:10,050

YOU NEED A BIG ROCKET WHICH IS  
WHAT THE SPACE LAUNCH SYSTEM

1462

01:08:10,050 --> 01:08:11,130

WILL PROVIDE.

1463

01:08:11,130 --> 01:08:12,420

AND YOU NEED A GROUNDS SYSTEM.

1464

01:08:12,420 --> 01:08:15,720

OUR FOCUS RIGHT NOW IS REALLY ON  
PROVIDING THOSE THREE.

1465

01:08:15,720 --> 01:08:17,849

AND THEN ONCE WE HAVE THOSE  
THREE, WE CAN GO VIRTUALLY

1466

01:08:17,849 --> 01:08:18,849  
ANYWHERE.

1467

01:08:18,849 --> 01:08:22,690  
IT'S JUST A MATTER OF HOW MANY  
LAUNCHES, HOW QUICKLY, HOW MANY

1468

01:08:22,690 --> 01:08:26,730  
TOTAL THERE ARE, AND BASICALLY  
JUST DOING THE MATH OF HOW MANY

1469

01:08:26,730 --> 01:08:27,730  
MISSIONS YOU NEED.

1470

01:08:27,730 --> 01:08:30,460  
AND SO THERE ARE OPTIONS WHERE  
WE MIGHT GO.

1471

01:08:30,460 --> 01:08:31,460  
WE MAY GO TO MARS.

1472

01:08:31,460 --> 01:08:32,750  
WE'VE HEARD THAT A LOT.

1473

01:08:32,750 --> 01:08:34,980  
WE DO THINK THAT'S ULTIMATELY  
OUR DESTINATION.

1474

01:08:34,980 --> 01:08:38,250  
HOW WE GET THERE, WE'RE STILL IN  
THE MIDDLE OF TRYING TO FIGURE

1475

01:08:38,250 --> 01:08:39,250  
IT OUT.

1476

01:08:39,250 --> 01:08:42,350

IF WE START WITH THE MOON OR  
START WITH SOME OTHER POINTS

1477

01:08:42,350 --> 01:08:45,569  
THAT ARE INTERESTING TO US,  
ASTEROIDS AND THINGS LIKE THAT,

1478

01:08:45,569 --> 01:08:52,060  
EVENTUALLY MARS IS REALLY THE  
PLACE WE'D LIKE TO BE.

1479

01:08:52,060 --> 01:08:53,930  
OKAY?

1480

01:08:53,930 --> 01:08:55,790  
>> QUESTIONS.

1481

01:08:55,790 --> 01:08:59,450  
>> CAN THEY ASK THE SAME THAT  
THEY ASKED, OR ARE THOSE OFF

1482

01:08:59,450 --> 01:09:00,450  
LIMITS?

1483

01:09:00,450 --> 01:09:04,219  
>> JUST GIVE IT TO THE TEACHER  
OVER HERE.

1484

01:09:04,219 --> 01:09:06,630  
>> ALL RIGHT.

1485

01:09:06,630 --> 01:09:08,680  
SO I WORK WITH 7 AND  
8-YEAR-OLDS.

1486

01:09:08,680 --> 01:09:12,930  
AND I HAVE A LOT OF LITTLE BOYS  
WHO LOVE LEGOS AND VIDEO GAMES.

1487

01:09:12,930 --> 01:09:14,830  
AND I'M WONDERING HOW -- THANK  
YOU.

1488  
01:09:14,830 --> 01:09:15,830  
THANK YOU.

1489  
01:09:15,830 --> 01:09:18,620  
SO I'M WONDERING HOW WE CAN TURN  
THE LOVE OF LEGOS AND VIDEO

1490  
01:09:18,620 --> 01:09:24,090  
GAMES INTO A NASA CAREER, A  
SPACE CAREER.

1491  
01:09:24,090 --> 01:09:27,640  
BECAUSE NOT EVERYONE WILL BE  
WORKING FOR NASA, OBVIOUSLY.

1492  
01:09:27,640 --> 01:09:31,310  
>> WELL, NOW, WE'D LIKE FOR THEM  
TO BE ABLE TO WORK ON SOMETHING

1493  
01:09:31,310 --> 01:09:32,580  
LIKE WE'RE DOING FOR NASA.

1494  
01:09:32,580 --> 01:09:35,989  
LET ME JUST SAY THIS.

1495  
01:09:35,989 --> 01:09:38,560  
LEGOS AND THINGS LIKE THAT, ALL  
OF US LITTLE BOYS PLAYED WITH,

1496  
01:09:38,560 --> 01:09:40,180  
YOU KNOW --  
>> AND GIRLS.

1497  
01:09:40,180 --> 01:09:41,690  
>> AND GIRLS, TOO, OKAY.

1498

01:09:44,690 --> 01:09:42,690

THANK YOU.

1499

01:09:44,690 --> 01:09:47,020

>> I WAS ABOUT TO SAY THAT, BUT  
I'M FROM THE SOUTH AND TALK

1500

01:09:47,020 --> 01:09:48,210

REALLY SLOW.

1501

01:09:48,210 --> 01:09:52,170

THAT WAS THE NEXT TWO WORDS OUT  
OF MY MOUTH.

1502

01:09:52,170 --> 01:09:54,820

BUT ESSENTIALLY WHAT WE'RE DOING  
HERE, BOTH ON THE GROUND AND ON

1503

01:09:54,820 --> 01:09:56,670

THE ROCKET IS WE'RE PUTTING  
PIECES TOGETHER.

1504

01:09:56,670 --> 01:09:59,530

I MEAN, LITTLE PIECES BECOME BIG  
PIECES.

1505

01:09:59,530 --> 01:10:02,261

ESSENTIALLY WHAT KENNEDY SPACE  
CENTER IS IN A WAY IS KIND OF A

1506

01:10:02,261 --> 01:10:05,300

FACTORY IN A SENSE WHERE LIKE,  
FOR EXAMPLE, THE ORION

1507

01:10:05,300 --> 01:10:10,510

SPACECRAFT IS BEING BUILT IN THE  
BUILDING, THREE OR FOUR MILES

1508

01:10:10,510 --> 01:10:11,960

SOUTH OF HERE.

1509

01:10:11,960 --> 01:10:14,090

WHEN PIECES COME IN, THEY'VE  
JUST STARTED TO COME IN IN THE

1510

01:10:14,090 --> 01:10:15,130

LAST FEW WEEKS.

1511

01:10:15,130 --> 01:10:16,890

NEAR NO BIGGER THAN THIS TABLE.

1512

01:10:16,890 --> 01:10:18,460

THEY'RE REALLY SMALL.

1513

01:10:18,460 --> 01:10:21,070

AND YOU START PUTTING  
TOGETHER -- THAT IS THE

1514

01:10:21,070 --> 01:10:22,350

SPACECRAFT FACTORY.

1515

01:10:22,350 --> 01:10:24,670

EVENTUALLY WHEN IT ROLLS OUT OF  
THE BUILDING, IT DOESN'T LOOK

1516

01:10:24,670 --> 01:10:27,370

VERY BIG ON THIS PICTURE BECAUSE  
EVERYTHING ELSE IS SO BIG.

1517

01:10:27,370 --> 01:10:31,850

IT'S ROUGHLY 18-FOOT DIAMETER.  
35, 40-FOOT LONG.

1518

01:10:31,850 --> 01:10:32,850

THE TOTAL PACKAGE.

1519

01:10:32,850 --> 01:10:35,190

AND IT GROWS TO BIGGER AND

BIGGER PIECES.

1520

01:10:35,190 --> 01:10:38,489

THAT'S ESSENTIALLY WHAT WE DO  
HERE IS TAKE SMALLER PIECES AND

1521

01:10:38,489 --> 01:10:39,860

MAKE BIGGER PIECES OUT OF THEM.

1522

01:10:39,860 --> 01:10:43,190

WE DO THAT ON THE GROUND, YOU  
KNOW, ALL THE GROUND SYSTEMS YOU

1523

01:10:43,190 --> 01:10:46,000

SEE, THE MAJOR FACILITIES, THE  
LAUNCH PADS, CRAWLERS, THINGS

1524

01:10:46,000 --> 01:10:47,000

LIKE THAT.

1525

01:10:47,000 --> 01:10:49,500

IN MY MIND, THAT'S KIND OF WHAT  
WE'RE DOING.

1526

01:10:49,500 --> 01:10:52,920

WE'RE JUST, YOU KNOW, BIGGER  
GUYS BEING ABLE TO PLAY -- AND

1527

01:10:52,920 --> 01:10:54,670

GIRLS -- PLAYING WITH BIGGER  
TOYS.

1528

01:10:54,670 --> 01:10:58,940

I DON'T KNOW IF THAT HELPS YOU  
ANSWER THE QUESTION, BUT THAT'S

1529

01:10:58,940 --> 01:10:59,940

THE WAY I LOOK AT IT.

1530

01:10:59,940 --> 01:11:00,940  
>> CAN I ASK A FOLLOW-UP?

1531  
01:11:00,940 --> 01:11:03,100  
>> I CAN'T BELIEVE THEY PAY ME  
TO DO THIS.

1532  
01:11:03,100 --> 01:11:04,100  
>> I KNOW.

1533  
01:11:04,100 --> 01:11:07,280  
I THINK SOME OF MY STUDENTS  
WATCHING ARE THINKING ALL RIGHT,

1534  
01:11:07,280 --> 01:11:10,300  
MY LEGOS, YOU KNOW, THERE'S A  
FUTURE FOR LEGOS IN MY LIFE.

1535  
01:11:10,300 --> 01:11:14,210  
A FOLLOW-UP QUESTION IS BEING'S  
THAT I WORK WITH 7 AND

1536  
01:11:14,210 --> 01:11:17,330  
8-YEAR-OLDS, THEY HAVE A HARD  
TIME WORKING AS A TEAM.

1537  
01:11:17,330 --> 01:11:21,770  
SO IS TEAMWORK IMPORTANT IN A  
CAREER LIKE THIS?

1538  
01:11:21,770 --> 01:11:23,110  
>> NOT AT ALL.

1539  
01:11:23,110 --> 01:11:25,300  
NO, I'M JUST KIDDING.

1540  
01:11:25,300 --> 01:11:29,020  
WE HAVE PERFECTLY SEAMLESS TEAMS  
THAT NEVER HAVE A DISAGREEMENT

1541

01:11:29,020 --> 01:11:30,880

AND ALL GOES WELL.

1542

01:11:30,880 --> 01:11:32,360

NO, TEAMWORK IS VITAL.

1543

01:11:32,360 --> 01:11:35,860

I MEAN, CLEARLY WHEN WE TRY TO  
GET TOGETHER AND, I MEAN, I

1544

01:11:35,860 --> 01:11:39,180

SPEND A LOT OF MY TIME AS A  
MANAGER TRYING TO GET PEOPLE TO

1545

01:11:39,180 --> 01:11:41,900

GET ALONG AND MAKE SURE THAT  
THEY'RE WORKING TOGETHER.

1546

01:11:41,900 --> 01:11:44,890

BECAUSE WHAT YOU SEE IN A SYSTEM  
LIKE THIS, THESE ARE PRETTY

1547

01:11:44,890 --> 01:11:48,460

SIMPLE GRAPHICS, BUT THERE'S SO  
MANY SYSTEMS, ELECTRICAL AND

1548

01:11:48,460 --> 01:11:53,111

AVIONICS AND PROPULSION AND  
ENGINES AND YOU NAME IT.

1549

01:11:53,111 --> 01:11:57,600

AND THE HUMAN SYSTEMS, OBVIOUSLY  
VERY COMPLEX THINGS WE'RE

1550

01:11:57,600 --> 01:11:58,600

WORKING WITH ULTIMATELY.

1551

01:11:58,600 --> 01:11:59,960

AND THEY START OUT WITH THESE

LITTLE PIECES.

1552

01:11:59,960 --> 01:12:04,510

BUT WHEN YOU PUT THEM TOGETHER,  
A BIG PART I'VE LEARNED IS A

1553

01:12:04,510 --> 01:12:07,940

FAMOUS QUOTE I'VE HEARD, I'M AN  
ENGINEER THAT DESCENDED INTO

1554

01:12:07,940 --> 01:12:08,940

MANAGEMENT.

1555

01:12:08,940 --> 01:12:11,060

SO NOW I'VE GOT TO MAKE SURE  
THAT PEOPLE PLAY TOGETHER.

1556

01:12:11,060 --> 01:12:13,120

AND IT'S A BIG PART OF IT.

1557

01:12:13,120 --> 01:12:14,120

IT REALLY IS.

1558

01:12:14,120 --> 01:12:16,420

IT'S PROBABLY THE MOST IMPORTANT  
PART, REALLY.

1559

01:12:16,420 --> 01:12:18,530

AS FAR AS THE TEAMWORK GOES.

1560

01:12:18,530 --> 01:12:19,530

OKAY.

1561

01:12:19,530 --> 01:12:20,790

YOU'RE WELCOME.

1562

01:12:20,790 --> 01:12:24,730

>> SOMEONE POINTED OUT EARLIER,  
SOME OF THESE FACILITIES HAVEN'T

1563

01:12:24,730 --> 01:12:27,520

CHANGED MUCH SINCE "APOLLO."

1564

01:12:27,520 --> 01:12:31,110

HOW MUCH OF A CHALLENGE IS IT TO  
UPGRADE FACILITIES THAT WERE

1565

01:12:31,110 --> 01:12:35,110

BUILT IN THE 1960s, YOU KNOW, 50  
YEARS AGO TO SUPPORT SOMETHING

1566

01:12:35,110 --> 01:12:36,449

LIKE THIS?

1567

01:12:36,449 --> 01:12:39,610

>> I WOULD SAY IT'S A CHALLENGE,  
BUT IT'S ALSO KIND OF A BLESSING

1568

01:12:39,610 --> 01:12:44,891

IN THE SENSE THAT THE GUYS BACK  
IN THE '60s AND LADIES, YOU

1569

01:12:44,891 --> 01:12:47,980

KNOW, I CAN'T REMEMBER -- SEE  
THERE?

1570

01:12:47,980 --> 01:12:50,880

I TALK SLOW, BUT I GET THERE  
EVENTUALLY.

1571

01:12:50,880 --> 01:12:54,710

THE '60s -- BACK IN THE '60s  
WHEN ALL THIS WAS BUILT, THE

1572

01:12:54,710 --> 01:12:56,960

SPACE PROGRAM ESSENTIALLY  
STARTED ON THE OTHER SIDE OF THE

1573

01:12:56,960 --> 01:12:59,600  
PROGRAM WHERE THEY LAUNCHED ON  
WHAT THEY CALLED ICBM ROW WITH

1574  
01:12:59,600 --> 01:13:00,900  
ALL THE SMALLER ROCKETS.

1575  
01:13:00,900 --> 01:13:05,290  
HAD THEY BUILT LC-39, THE VAB  
AND ALL THAT, THEY REALLY DESIGN

1576  
01:13:05,290 --> 01:13:08,850  
IT HAD PRETTY MODULAR WHERE IT  
COULD GO JUST ABOUT ANYWHERE.

1577  
01:13:08,850 --> 01:13:12,930  
AND ACTUALLY, IF YOU GOOGLE IT  
OR WHATEVER, IT WAS ACTUALLY

1578  
01:13:12,930 --> 01:13:15,160  
DESIGNED AROUND A NOVA CLASS  
VEHICLE.

1579  
01:13:15,160 --> 01:13:17,640  
IT WAS ACTUALLY BIGGER THAN  
ANYTHING WE'VE EVER ACTUALLY

1580  
01:13:17,640 --> 01:13:18,640  
DEVELOPED.

1581  
01:13:18,640 --> 01:13:20,520  
SO WE HAVE A LOT OF MARGIN IN  
THERE TO BUILD A BIGGER AND

1582  
01:13:20,520 --> 01:13:23,400  
BIGGER ROCKET.

1583  
01:13:23,400 --> 01:13:26,200  
I WOULD SAY IN GENERAL, LIKE IN  
THE VAB, FOR EXAMPLE, YOU CAN

1584

01:13:26,200 --> 01:13:29,350

LOOK AT THE COLUMNS THAT HOLD  
THE PLATFORMS UP WHICH SERVE AS

1585

01:13:29,350 --> 01:13:30,770

THE ROCKET.

1586

01:13:30,770 --> 01:13:34,440

THOSE ARE OUTFITTED WITH HOLES  
UP AND DOWN THOSE COLUMNS SO

1587

01:13:34,440 --> 01:13:36,730

THAT YOU CAN PUT A PLATFORM  
PRETTY MUCH AT ANY HEIGHT THAT

1588

01:13:36,730 --> 01:13:39,960

YOU WANT TO, WHICH IS WHAT WE'RE  
ABOUT TO DO WITH THIS NEXT

1589

01:13:39,960 --> 01:13:40,960

PROGRAM.

1590

01:13:40,960 --> 01:13:43,250

THINGS LIKE THAT WERE DESIGNED  
TO WHERE WE'RE PRETTY MUCH

1591

01:13:43,250 --> 01:13:45,140

UNLIMITED TO WHAT WE CAN DO.

1592

01:13:45,140 --> 01:13:47,080

THERE'S ALSO FOUR VAB BAYS.

1593

01:13:47,080 --> 01:13:49,230

FOR THIS PROGRAM WE'RE ONLY  
GOING TO NEED ONE SO WE HAVE

1594

01:13:49,230 --> 01:13:52,880

THREE MORE TO DO COMMERCIAL OR

OTHER THINGS.

1595

01:13:52,880 --> 01:13:53,880

WE HAVE TWO CRAWLERS.

1596

01:13:53,880 --> 01:13:56,370

WE PROBABLY ONLY NEED ONE.

1597

01:13:56,370 --> 01:13:59,090

THAT'S AN EXTRA ONE THAT WE CAN  
PLAY WITH IF WE NEED TO.

1598

01:13:59,090 --> 01:14:00,690

TWO LAUNCH PADS RIGHT NOW.

1599

01:14:00,690 --> 01:14:02,110

WE ONLY NEED ONE.

1600

01:14:02,110 --> 01:14:04,730

SO THERE'S A LOT OF MARGIN IN  
THERE THAT WE CAN TAKE ADVANTAGE

1601

01:14:04,730 --> 01:14:05,730

OF.

1602

01:14:05,730 --> 01:14:08,450

BUT GENERALLY, I WOULD SAY WHAT  
THEY DID BACK IN THE '60s, VERY

1603

01:14:08,450 --> 01:14:09,450

FLEXIBLE.

1604

01:14:09,450 --> 01:14:11,520

THE CRAWLER THEY BUILT BACK  
THEN, WE'RE STILL USING IT.

1605

01:14:11,520 --> 01:14:13,950

THE THROW MOBILE LAUNCH  
PLATFORMS WE USED FOR SHUTTLE

1606

01:14:13,950 --> 01:14:15,700

FOR 30 YEARS, WE STILL HAVE  
THEM.

1607

01:14:15,700 --> 01:14:18,410

THEY'RE AVAILABLE FOR COMMERCIAL  
USERS IF THEY CHOOSE TO USE

1608

01:14:18,410 --> 01:14:19,410

THEM.

1609

01:14:19,410 --> 01:14:20,570

AND SAME WITH THE LAUNCH PADS.

1610

01:14:20,570 --> 01:14:21,570

WE'RE STILL USING THEM.

1611

01:14:21,570 --> 01:14:23,510

AS A MATTER OF FACT, THIS IS  
REALLY THE FIRST PROGRAM WE

1612

01:14:23,510 --> 01:14:26,540

DON'T HAVE ANY MAJOR NEW  
CONSTRUCTION WITH THE EXCEPTION

1613

01:14:26,540 --> 01:14:27,540

OF THE MOBILE LAUNCHER.

1614

01:14:27,540 --> 01:14:30,570

YOU'LL SEE OUT HERE AT THE VAB,  
THIS BIG GRAY STRUCTURE ON THE

1615

01:14:30,570 --> 01:14:31,570

RIGHT.

1616

01:14:31,570 --> 01:14:33,410

WITH THE EXCEPTION OF THAT, REAR  
REALLY NOT BUILDING ANYTHING

1617

01:14:33,410 --> 01:14:35,500

NEW.

1618

01:14:35,500 --> 01:14:37,870

I WOULD SAY IT'S A CHALLENGE  
BUT, I MEAN, THANKFULLY, THEY

1619

01:14:37,870 --> 01:14:40,560

HAD THE MONEY BACK THEN TO BUILD  
THIS INFRASTRUCTURE.

1620

01:14:40,560 --> 01:14:47,130

WE'RE STILL TAKING ADVANTAGE OF  
IT.

1621

01:14:47,130 --> 01:14:54,380

>> I HAD A QUESTION WITH THE  
SHUTTLE PROGRAM NOT RUNNING, THE

1622

01:14:54,380 --> 01:14:57,650

SHUTTLE RUNWAY, IS THAT GOING TO  
BE MAINTAINED, THE VERY LONG

1623

01:14:57,650 --> 01:14:58,650

RUNWAY?

1624

01:14:58,650 --> 01:14:59,700

>> IT IS.

1625

01:14:59,700 --> 01:15:02,610

>> AND THE OTHER QUESTION TO  
FOLLOW UP, THERE'S THE PROJECT

1626

01:15:02,610 --> 01:15:10,460

PAUL ALLEN, STRATA LAUNCH, THE  
ROCKET, WOULD THAT BE USING THAT

1627

01:15:10,460 --> 01:15:12,770

RUNWAY, PERHAPS?

1628

01:15:12,770 --> 01:15:13,770

>> WE HOPE SO.

1629

01:15:13,770 --> 01:15:16,110

WE ACTUALLY MET WITH THOSE GUYS  
LAST WEEK.

1630

01:15:16,110 --> 01:15:17,110

IT WAS GUYS.

1631

01:15:17,110 --> 01:15:18,110

IT WAS TWO GUYS.

1632

01:15:18,110 --> 01:15:20,020

I MEAN, YOU KNOW.

1633

01:15:20,020 --> 01:15:23,090

THEY HAVE WOMEN WORKING FOR  
THEM, TOO, I THINK, BUT IT WAS

1634

01:15:23,090 --> 01:15:24,960

JUST GUYS THAT CAME TO SEE US.

1635

01:15:24,960 --> 01:15:27,230

BUT WE'VE ACTUALLY MET WITH  
THEM.

1636

01:15:27,230 --> 01:15:29,400

AND THEY'RE LOOKING REAL HARD AT  
COMING HERE.

1637

01:15:29,400 --> 01:15:31,680

BUT YES, THAT IS ON THEIR RADAR.

1638

01:15:31,680 --> 01:15:34,670

AND TO ANSWER YOUR FIRST  
QUESTION, WE ARE PLANNING TO

1639

01:15:34,670 --> 01:15:37,770

MAINTAIN THE SLF AT SOME LEVEL.

1640

01:15:37,770 --> 01:15:39,440

AND OBVIOUSLY, WE'RE NOT LANDING  
SHUTTLES.

1641

01:15:39,440 --> 01:15:42,000

WE DO HAVE ONE MORE ORBITER THAT  
NEEDS TO LEAVE TO GO ON ITS

1642

01:15:42,000 --> 01:15:43,610

FERRY FLIGHT.

1643

01:15:43,610 --> 01:15:46,420

AND WE'RE KIND OF DOWNMODED IT  
IN THE SENSE WE DON'T NEED

1644

01:15:46,420 --> 01:15:50,950

SHUTTLE LANDING AIDS TO LAND THE  
SHUTTLE, BUT WE ARE PLANNING ON

1645

01:15:50,950 --> 01:15:51,950

MAINTAINING THE RUNWAY.

1646

01:15:51,950 --> 01:15:54,440

AND WE'RE LOOKING REAL HARD  
RIGHT NOW AT STRATA LAUNCH AS ONE

1647

01:15:54,440 --> 01:15:58,530

OF OUR POTENTIAL USERS AND HOW  
WE MIGHT MODIFY THE SLS TO DO

1648

01:15:58,530 --> 01:15:59,980

THAT.

1649

01:15:59,980 --> 01:16:00,980

IT'S A GOOD RUNWAY.

1650

01:16:00,980 --> 01:16:04,460

IT'S NOT ONLY LONG AND STRAIGHT,  
IT'S ALSO GOT A HIGH CAPACITY

1651

01:16:04,460 --> 01:16:07,960

AND THE STRATA LAUNCH VEHICLE IS  
SO HEAVY THAT THE SLF LOOKS LIKE

1652

01:16:07,960 --> 01:16:09,440

A GOOD SITE FOR THEM.

1653

01:16:09,440 --> 01:16:11,309

WE REALLY HOPE THEY COME HERE.

1654

01:16:11,309 --> 01:16:15,440

>> MY FATHER IS WATCHING.

1655

01:16:15,440 --> 01:16:18,900

HE ACTUALLY USED TO WORK HERE AS  
AN ENGINEER ON THE CRAWLER.

1656

01:16:18,900 --> 01:16:21,040

AND HE WAS WONDERING WITH ALL  
THE NEW UPGRADES THAT YOU GUYS

1657

01:16:21,040 --> 01:16:24,320

PLAN TO DOING, IS IT STILL GOING  
TO BE ABOUT A MILE AN HOUR?

1658

01:16:24,320 --> 01:16:25,320

>> YEP.

1659

01:16:25,320 --> 01:16:29,420

THE ONE THING WE'RE NOT PLAYING  
WITH IS THE SPEED.

1660

01:16:29,420 --> 01:16:31,900

HONESTLY, WE DON'T REALLY NEED

TO.

1661

01:16:31,900 --> 01:16:34,680  
IF WE EVER HAD A NEED TO GO  
FASTER, WE'D LOOK AT WAYS.

1662

01:16:34,680 --> 01:16:36,770  
AND WE HAVE LOOKED AT WAYS OF  
DOING THAT.

1663

01:16:36,770 --> 01:16:40,500  
THE CRAWLER'S PROBABLY NOT OUR  
BEST OPTION TO GO FAST.

1664

01:16:40,500 --> 01:16:43,940  
AND WE CAN'T PLAY -- I MEAN,  
SOME OF THE SPEEDS THAT WE PLAY

1665

01:16:43,940 --> 01:16:47,860  
WITH IS NOT DUE JUST BECAUSE  
IT'S SLOW, IT'S BECAUSE THE

1666

01:16:47,860 --> 01:16:50,620  
VEHICLE DOESN'T WANT TO VIBRATE  
AT A CERTAIN FREQUENCY.

1667

01:16:50,620 --> 01:16:53,730  
SO YOU PLAY WITH THAT SPEED TO  
GET IT RIGHT.

1668

01:16:53,730 --> 01:16:59,560  
I DON'T THINK WE'VE SETTLED ON A  
SPEED YET, BUT IT WILL BE SLOW.

1669

01:16:59,560 --> 01:17:00,710  
THAT MUCH I DO NOW.

1670

01:17:00,710 --> 01:17:04,250  
ABOUT A MILE AN HOUR, I THINK  
SHUTTLE ENDED UP RUNNING .8

1671

01:17:04,250 --> 01:17:05,250

OR .9.

1672

01:17:05,250 --> 01:17:07,260

I'M NOT SURE WHAT WE'RE GOING TO DO.

1673

01:17:07,260 --> 01:17:09,690

YOU'LL HAVE TIME TO SEE IT WHEN IT'S ROLLING.

1674

01:17:09,690 --> 01:17:10,690

OKAY.

1675

01:17:10,690 --> 01:17:11,690

>> HI.

1676

01:17:11,690 --> 01:17:13,300

I HAVE A QUESTION, PLEASE.

1677

01:17:13,300 --> 01:17:18,320

THIS IS A QUESTION THAT I'VE BEEN ASKED TO ASK BY A MEMBER OF

1678

01:17:18,320 --> 01:17:19,550

ONE OF THE SOCIAL NETWORKS.

1679

01:17:19,550 --> 01:17:24,230

AND I DON'T KNOW IF THIS IS ONE OF YOUR AREAS OF EXPERTISE OR

1680

01:17:24,230 --> 01:17:25,230

NOT.

1681

01:17:25,230 --> 01:17:28,550

>> A FRIEND'S PROBLEM, NOT YOUR PROBLEM, RIGHT?

1682  
01:17:28,550 --> 01:17:29,550  
OKAY.

1683  
01:17:29,550 --> 01:17:30,550  
I GOT IT.

1684  
01:17:30,550 --> 01:17:35,340  
>> IF YOU KNOW ANYTHING ABOUT  
THE STATUS OF THE "X" PROGRAM

1685  
01:17:35,340 --> 01:17:39,830  
WHICH WOULD BE THE MULTIMISSION  
CREW EXPLORATION VEHICLE.

1686  
01:17:39,830 --> 01:17:40,830  
>> WHAT WAS THE FIRST ONE, THE  
NAUTILUS?

1687  
01:17:40,830 --> 01:17:42,290  
>> NAUTILUS "X."

1688  
01:17:42,290 --> 01:17:46,260  
>> COULD YOU SPELL THAT, PLEASE?

1689  
01:17:46,260 --> 01:17:51,730  
>> ONGOING PROGRAM, A NEW  
EXPLORATION VEHICLE THAT NASA IS

1690  
01:17:51,730 --> 01:17:52,730  
WORKING ON.

1691  
01:17:52,730 --> 01:17:55,560  
IT'S SUPPOSED TO BE COST  
EFFECTIVE AND HAS TO DO WITH THE

1692  
01:17:55,560 --> 01:17:56,560  
CENTRIFUGE.

1693

01:17:56,560 --> 01:18:01,790  
>> I MEAN, IT SOUNDS LIKE THE  
ACRONYM WAS MPCV.

1694  
01:18:01,790 --> 01:18:07,590  
MULTIPERSON CREW VEHICLE.

1695  
01:18:07,590 --> 01:18:15,700  
>> OUT OF LOW-ORBIT TO A MISSION  
TO OTHER ENTITIES.

1696  
01:18:15,700 --> 01:18:16,700  
>> NO.

1697  
01:18:16,700 --> 01:18:17,700  
>> DO YOU KNOW ANYTHING ABOUT  
THAT?

1698  
01:18:17,700 --> 01:18:20,150  
>> IT SOUNDS LIKE A GENERIC NAME  
FOR WHAT WE'RE DOING WITH ORION,

1699  
01:18:20,150 --> 01:18:23,920  
EXACTLY THAT, THE MULTIPURPOSE  
CREW EXPLORATION VEHICLE.

1700  
01:18:23,920 --> 01:18:26,190  
IT'S KIND OF THE MERGER OF TWO  
ACRONYMS WE'VE USED FOR THE SAME

1701  
01:18:26,190 --> 01:18:27,480  
THING.

1702  
01:18:27,480 --> 01:18:29,280  
>> THIS IS CALLED THE NAUTILUS  
"X."

1703  
01:18:29,280 --> 01:18:30,280  
>> OKAY.

1704

01:18:30,280 --> 01:18:33,750

IF IT'S ON WIKIPEDIA, IT'S REAL,  
BUT, I MEAN --

1705

01:18:33,750 --> 01:18:36,540

>> YOU NEVER KNOW, RIGHT?

1706

01:18:36,540 --> 01:18:37,540

>> I DON'T KNOW.

1707

01:18:37,540 --> 01:18:40,469

>> NO, BUT APPARENTLY IT'S AN  
ONGOING PROJECT.

1708

01:18:40,469 --> 01:18:43,850

>> YEAH, I'M NOT -- IS IT A NASA  
PROJECT, OR IS IT PRIVATE?

1709

01:18:43,850 --> 01:18:44,850

>> I BELIEVE SO.

1710

01:18:44,850 --> 01:18:45,850

>> REALLY?

1711

01:18:45,850 --> 01:18:47,020

IT'S PROBABLY A RESEARCH  
PROJECT.

1712

01:18:47,020 --> 01:18:48,920

HASN'T MADE IT HERE YET.

1713

01:18:48,920 --> 01:18:51,110

>> IF YOU BELIEVE WIKIPEDIA, OF  
COURSE.

1714

01:18:51,110 --> 01:18:52,270

>> USUALLY I DO.

1715

01:18:52,270 --> 01:18:55,560  
MY KIDS AREN'T ALLOWED TO USE  
IT, I'M TOLD.

1716  
01:18:55,560 --> 01:18:58,930  
TEACHERS APPARENTLY HAVE BANNED  
WIKIPEDIA.

1717  
01:18:58,930 --> 01:19:01,720  
>> SINCE YOU HAVE SUCH A GOOD  
SENSE OF HUMOR, I'D LIKE TO ASK

1718  
01:19:01,720 --> 01:19:04,800  
YOU, WHAT'S IT LIKE TALKING TO  
AN AUDIENCE THAT'S LOOKING DOWN

1719  
01:19:04,800 --> 01:19:08,880  
AND FIDDLING WITH THEIR COMPUTER  
AND SOCIAL DEVICES?

1720  
01:19:08,880 --> 01:19:11,530  
>> OH, IT'S GREAT.

1721  
01:19:11,530 --> 01:19:15,700  
ACTUALLY, IT'S FUNNY YOU SAY  
THAT BECAUSE WE HAVE -- THIS IS

1722  
01:19:15,700 --> 01:19:16,800  
THE WAY WE NEED NOWADAYS.

1723  
01:19:16,800 --> 01:19:19,489  
I MEAN, THE OLD-SCHOOL GUYS, IT  
DRIVES THEM CRAZY.

1724  
01:19:19,489 --> 01:19:22,210  
I'M KIND OF IN BETWEEN THE  
OLD-SCHOOL AND THE YOUNGER KIDS.

1725  
01:19:22,210 --> 01:19:25,390  
WE JOKE ABOUT PEOPLE PLAYING

## BATTLESHIP IF YOU'RE OLD ENOUGH

1726

01:19:25,390 --> 01:19:26,800

TO REMEMBER THAT.

1727

01:19:26,800 --> 01:19:30,630

G-5 AND HIT AND THAT SORT OF  
THING.

1728

01:19:30,630 --> 01:19:33,030

WE'RE USED TO PEOPLE PLAYING  
BATTLESHIP ALL THE TIME.

1729

01:19:33,030 --> 01:19:35,340

THE OLDER GUYS THAT WE WORK  
WITH, IT DRIVES THEM CRAZY.

1730

01:19:35,340 --> 01:19:36,340

THEY WANT TO BAN THEM.

1731

01:19:36,340 --> 01:19:37,530

IT DOESN'T BOTHER US A BIT.

1732

01:19:37,530 --> 01:19:40,640

WE'VE EVEN GOTTEN TO A POINT WE  
REALLY WANT YOU TO PAY

1733

01:19:40,640 --> 01:19:42,580

ATTENTION, LOOK UP FROM YOUR  
LAPTOPS.

1734

01:19:42,580 --> 01:19:44,560

I WANT Y'ALL TO PAY ATTENTION.

1735

01:19:44,560 --> 01:19:46,410

IT IS PART OF THE CULTURE NOW.

1736

01:19:46,410 --> 01:19:48,210

>> WE ARE LISTENING.

1737

01:19:48,210 --> 01:19:49,210

>> GOOD.

1738

01:19:49,210 --> 01:19:52,340

THAT'S WHY I TALK SLOW.

1739

01:19:52,340 --> 01:19:54,940

>> I HAD A COMPARE AND CONTRAST QUESTION.

1740

01:19:54,940 --> 01:19:58,590

I'VE CRAWLED INSIDE AN ENGINE OF SATURN 5.

1741

01:19:58,590 --> 01:20:04,869

CAN YOU COMPARE SLS IN TERMS OF SIZE, THRUST, ET CETERA?

1742

01:20:04,869 --> 01:20:05,869

>> YEAH.

1743

01:20:05,869 --> 01:20:08,570

IT'S A LITTLE -- WHATEVER SATURN 5 HAD, WE'RE GOING TO BE A

1744

01:20:08,570 --> 01:20:09,570

LITTLE BIGGER.

1745

01:20:09,570 --> 01:20:15,369

THAT'S KIND OF THE RULE OF THUMB.

1746

01:20:15,369 --> 01:20:16,369

>> WHOO!

1747

01:20:16,369 --> 01:20:17,369

>> ALL RIGHT.

1748

01:20:17,369 --> 01:20:18,369

THAT WAS EASY.

1749

01:20:18,369 --> 01:20:19,760

WELL, FOR EXAMPLE, IT'S FIVE  
SMSEs IS GOING TO BE THE

1750

01:20:19,760 --> 01:20:21,420

ULTIMATE WHERE WE END UP.

1751

01:20:21,420 --> 01:20:23,220

I TAKE IT BACK.

1752

01:20:23,220 --> 01:20:24,220

WE'RE KIND OF DEBATING.

1753

01:20:24,220 --> 01:20:26,380

IT'S ACTUALLY GOING TO BE FOUR  
SMSEs, COULD GO TO FIVE.

1754

01:20:26,380 --> 01:20:29,130

I THINK WE'VE SETTLED ON FOUR  
FOR NOW.

1755

01:20:29,130 --> 01:20:33,010

DIAMETER WISE IT'S A LITTLE  
THINNER, IT'S GOING TO BE 27.5

1756

01:20:33,010 --> 01:20:37,400

FOOT DIAMETER WHICH IS COMMON ON  
SHUTTLE, BUT IT'S GOING TO BE

1757

01:20:37,400 --> 01:20:38,400

LONGER.

1758

01:20:38,400 --> 01:20:41,360

IT'S ACTUALLY ONE OF THE THINGS  
THAT WE IRONICALLY DEAL WITH

1759

01:20:41,360 --> 01:20:44,810

AMAZES ME STILL, THE LIMIT OF  
THE HEIGHT OF A ROCKET THAT CAN

1760

01:20:44,810 --> 01:20:48,230

ROLL OUT OF THE VAB IS RIGHT AT  
400 FEET.

1761

01:20:48,230 --> 01:20:50,570

AND WE'RE PLAYING THAT HERE.

1762

01:20:50,570 --> 01:20:53,360

YOU KNOW, COMPARE THAT TO SOME  
OF THESE GUYS THAT TOP OUT

1763

01:20:53,360 --> 01:20:56,640

ROUGHLY IN THE 200-FOOT RANGE,  
WE'RE ROUGHLY TWICE.

1764

01:20:56,640 --> 01:20:59,060

YEAH, IT'S BIGGER.

1765

01:20:59,060 --> 01:21:02,380

BUT WE LIMIT THE ROCKET  
DESIGNERS AND THEY'RE PRIMARILY

1766

01:21:02,380 --> 01:21:05,489

OUT OF MARSHALL SPACE FLIGHT  
CENTER IN HUNTSVILLE, ALABAMA.

1767

01:21:05,489 --> 01:21:10,320

WE KEEP REMINDING THEM, DON'T  
DESIGN A ROCKET BIGGER THAN THE

1768

01:21:10,320 --> 01:21:11,320

VAB.

1769

01:21:11,320 --> 01:21:13,780

WE COULD BUILD ANOTHER VAB, BUT

WE'RE ALREADY NOT USING THE ONE

1770

01:21:13,780 --> 01:21:15,460

WE HAVE AS MUCH AS WE'D LIKE.

1771

01:21:15,460 --> 01:21:19,510

I MEAN, AND DEPENDING ON THE  
CONFIGURATION THAT WE'RE DEALING

1772

01:21:19,510 --> 01:21:22,489

WITH, I THINK IT'S GOING TO TOP  
OUT JUST UNDER 400 FEET WHICH IS

1773

01:21:22,489 --> 01:21:25,380

NICE BECAUSE IT FITS IN THE VAB.

1774

01:21:25,380 --> 01:21:28,870

AND WE DO -- AND THE CORE IS  
THINNER, BUT OBVIOUSLY, YOU CAN

1775

01:21:28,870 --> 01:21:30,860

TELL BY THE PICTURE THERE ARE  
GOING TO BE TWO STRAP-ON

1776

01:21:30,860 --> 01:21:34,410

BOOSTERS, PRESUMABLY WE'RE GOING  
TO START WITH SOLIDS.

1777

01:21:34,410 --> 01:21:37,170

WE MAY EVOLVE BEYOND THAT.

1778

01:21:37,170 --> 01:21:41,490

THE MAIN -- AND I WANT TO SAY I  
CAN'T QUOTE YOU THE FIRST STAGE

1779

01:21:41,490 --> 01:21:44,739

THRUST RIGHT OFF THE TOP OF MY  
HEAD.

1780

01:21:44,739 --> 01:21:47,640  
THE GROSS LIFTOFF WEIGHT IS  
AROUND -- I WANT TO SAY AROUND 8

1781  
01:21:47,640 --> 01:21:51,160  
MILLION POUNDS WHERE SATURN 5  
WAS MORE LIKE 6.5 MILLION

1782  
01:21:51,160 --> 01:21:52,160  
POUNDS.

1783  
01:21:52,160 --> 01:21:53,830  
SO A BIG ROCK.

1784  
01:21:53,830 --> 01:21:54,940  
BIGGEST ONE EVER.

1785  
01:21:54,940 --> 01:21:58,410  
>> WE'LL ACTUALLY SEE ONE LATER  
TODAY.

1786  
01:21:58,410 --> 01:22:02,560  
JUST FYI.

1787  
01:22:02,560 --> 01:22:05,270  
>> YOU MENTIONED WHEN YOU  
STARTED, YOU WANTED -- PART OF

1788  
01:22:05,270 --> 01:22:09,770  
US PUTTING OUR FACES DOWN ON OUR  
SCREENS DOING RESEARCH, 800

1789  
01:22:09,770 --> 01:22:10,930  
STANDARD SCHOOL BUSES.

1790  
01:22:10,930 --> 01:22:11,949  
>> ALL RIGHT.

1791  
01:22:13,989 --> 01:22:12,969

ALL RIGHT.

1792

01:22:13,989 --> 01:22:15,000

APPRECIATE THAT.

1793

01:22:15,000 --> 01:22:17,620

NOW I'VE GOT TO GET MY GRAPHICS  
GUY THAT DID THIS FOR ME.

1794

01:22:17,620 --> 01:22:20,460

I REALLY WANT TO SHOW A PICTURE  
OF 800 -- I DON'T KNOW HOW, BUT

1795

01:22:20,460 --> 01:22:23,550

800 SCHOOL BUSES BECAUSE THAT'S  
REALLY WHAT WE'RE LIFTING.

1796

01:22:23,550 --> 01:22:25,560

OKAY, I'M GLAD TO KNOW THAT  
MYSELF.

1797

01:22:25,560 --> 01:22:28,070

WE ALL LEARNED IT AT THE SAME  
TIME.

1798

01:22:28,070 --> 01:22:31,720

>> TEACHER, A QUESTION?

1799

01:22:31,720 --> 01:22:35,989

I'M SURE YOU HAVE A NAME.

1800

01:22:35,989 --> 01:22:37,920

>> DO WE HAVE MORE TIME?

1801

01:22:37,920 --> 01:22:39,460

I'LL THINK OF SOMETHING.

1802

01:22:39,460 --> 01:22:41,780

SORRY, I WAS FACEBOOKING THERE,

TWEETING.

1803

01:22:41,780 --> 01:22:45,000

ACTUALLY, MY KIDS ARE CALLING ME  
ON TWITTER BECAUSE WE ARE NOT

1804

01:22:45,000 --> 01:22:47,430

ALLOWED TO DO FACEBOOK.

1805

01:22:49,650 --> 01:22:48,540

>> OH.

1806

01:22:49,650 --> 01:22:51,800

AND I SAW YOUR COMMENTS ABOUT  
THE SOCIAL MEDIA, IT WAS REALLY

1807

01:22:51,800 --> 01:22:54,550

INTERESTING BECAUSE MY KIDS ARE  
NATIVES.

1808

01:22:54,550 --> 01:22:58,219

THEY'RE 7 AND THEY'VE GOT THEIR  
OWN LITTLE TWITTER, YOU KNOW,

1809

01:22:58,219 --> 01:22:59,219

HANDLES AND EVERYTHING.

1810

01:22:59,219 --> 01:23:00,219

>> I BELIEVE IT.

1811

01:23:00,219 --> 01:23:01,219

YEP.

1812

01:23:01,219 --> 01:23:02,460

>> SO I'M KIND OF HEDGING HERE A  
MINUTE FOR MY QUESTION.

1813

01:23:02,460 --> 01:23:03,950

I FORGOT.

1814

01:23:03,950 --> 01:23:05,670

ARE YOU READY TO ASK A QUESTION?

1815

01:23:05,670 --> 01:23:09,030

>> YOU'RE COVERING IT ALL.

1816

01:23:09,030 --> 01:23:11,290

>> SO SHE'S THE TEACHER OF THE  
GROUP, HUH?

1817

01:23:11,290 --> 01:23:12,290

>> YEAH.

1818

01:23:12,290 --> 01:23:13,320

WELL, THERE'S ANOTHER ONE OR TWO  
HERE.

1819

01:23:13,320 --> 01:23:14,320

>> OKAY.

1820

01:23:14,320 --> 01:23:15,320

>> BUT I KNOW MY KIDS ARE  
WATCHING.

1821

01:23:15,320 --> 01:23:18,179

BUT DO YOU HAVE A QUESTION?

1822

01:23:18,179 --> 01:23:21,550

>> NO, CAN I JUST MAKE A  
STATEMENT?

1823

01:23:21,550 --> 01:23:26,090

MY KIDS WERE BLESSED TO BE  
INTRODUCED TO SPACE X DURING THE

1824

01:23:26,090 --> 01:23:27,090

STS-135 LAUNCH.

1825

01:23:27,090 --> 01:23:30,150

WE WERE INVITED TO VIEW THE  
DRAGON.

1826

01:23:30,150 --> 01:23:33,440

AND I JUST WANTED TO TELL YOU,  
TWO KIDS IN THE WHOLE WORLD,

1827

01:23:33,440 --> 01:23:34,690

THEY'VE DRANK THE KOOL-AID.

1828

01:23:34,690 --> 01:23:35,690

THEY'RE HOOKED.

1829

01:23:35,690 --> 01:23:36,690

>> GOOD, GOOD, GOOD.

1830

01:23:36,690 --> 01:23:37,980

>> SO I THANK YOU FOR ALL THAT  
YOU'RE DOING.

1831

01:23:37,980 --> 01:23:39,480

>> THAT'S GOOD TO HEAR.

1832

01:23:39,480 --> 01:23:40,800

>> YEP.

1833

01:23:40,800 --> 01:23:43,380

>> I REMEMBERED MY QUESTION, I  
HAD BEEN WANTING TO GET THIS IN

1834

01:23:43,380 --> 01:23:45,080

FOR THE STUDENTS.

1835

01:23:45,080 --> 01:23:46,570

THEY LOVE ASTRONAUTS.

1836

01:23:46,570 --> 01:23:49,860

SO CAN YOU TELL AN ASTRONAUT  
STORY?

1837

01:23:49,860 --> 01:23:52,250

LIKE, YOU KNOW, A TIME, AN  
INTERESTING TIME WHEN YOU'VE MET

1838

01:23:52,250 --> 01:23:53,250

AN ASTRONAUT?

1839

01:23:53,250 --> 01:23:55,510

THEY JUST LOVE -- AND I DON'T  
KNOW WE HAVE ONE COMING TODAY.

1840

01:23:55,510 --> 01:23:56,860

>> OH, YOU DON'T.

1841

01:23:56,860 --> 01:23:59,730

SO I'M KIND OF THE --

>> I'VE BEEN TRYING TO GET THIS

1842

01:23:59,730 --> 01:24:00,730

QUESTION IN.

1843

01:24:00,730 --> 01:24:02,230

>> ASTRONAUT BY PROXY, HUH?

1844

01:24:02,230 --> 01:24:03,960

LET ME TRY TO THINK OF  
SOMETHING.

1845

01:24:03,960 --> 01:24:07,250

WELL, I'LL TELL YOU, LIKE, FOR  
EXAMPLE, I'M TRYING TO THINK OF

1846

01:24:07,250 --> 01:24:08,949

A REAL GOOD ONE.

1847

01:24:08,949 --> 01:24:11,880

ONE OF THE THINGS THEY DIDN'T  
EXPECT WHEN THEY FIRST FLEW WAS

1848

01:24:11,880 --> 01:24:15,540

ON SHUTTLE IS WHEN THE WAY THE  
SOLIDS BASICALLY JUST THROW YOU

1849

01:24:15,540 --> 01:24:19,250

UP THERE AND WHEN THOSE SOLIDS  
DROP OFF, IT'S LIKE GOING IN

1850

01:24:19,250 --> 01:24:20,250

REVERSE ALMOST.

1851

01:24:20,250 --> 01:24:22,120

IT JUST KIND OF DROPS OUT.

1852

01:24:22,120 --> 01:24:25,360

TO ME, THOSE GUYS WHO TRAIN AND  
TRAIN, THERE'S CERTAIN THINGS

1853

01:24:25,360 --> 01:24:26,550

THEY CAN'T SIMULATE.

1854

01:24:26,550 --> 01:24:30,830

AND I DON'T KNOW, TO ME, THAT  
WAS KIND OF A UNIQUE THING THAT

1855

01:24:30,830 --> 01:24:34,790

EVEN THOSE GUYS HAVE DONE ALL  
THAT WOULDN'T HAVE EXPECTED

1856

01:24:34,790 --> 01:24:35,790

THAT.

1857

01:24:35,790 --> 01:24:37,280

IT WAS A THRILL, OBVIOUSLY.

1858

01:24:37,280 --> 01:24:39,730

THE QUESTION WE MOSTLY GET IS  
ABOUT HOW DO WE GO TO THE

1859

01:24:39,730 --> 01:24:40,730

BATHROOM IN SPACE.

1860

01:24:40,730 --> 01:24:42,660

>> WE'VE GOT THAT ONE COVERED  
ALREADY.

1861

01:24:42,660 --> 01:24:43,660

>> OKAY, GOOD.

1862

01:24:43,660 --> 01:24:46,290

MY WIFE'S DONE THAT A COUPLE,  
GOING TO SEVERAL SCHOOLS.

1863

01:24:46,290 --> 01:24:47,989

THAT'S THE MAIN THING THEY ASK.

1864

01:24:47,989 --> 01:24:50,060

HOPEFULLY THAT'S BEEN COVERED BY  
SOMEBODY ELSE.

1865

01:24:50,060 --> 01:24:52,040

I DON'T KNOW.

1866

01:24:52,040 --> 01:24:53,110

WE WORK FOR AN ASTRONAUT.

1867

01:24:53,110 --> 01:24:54,310

BOB IS OURS.

1868

01:24:54,310 --> 01:24:55,910

HE'S A GOOD GUY.

1869

01:24:55,910 --> 01:25:00,120

HE'S HELPED MAKING A LOT OF  
VISION COME TO PASS.

1870

01:25:00,120 --> 01:25:03,320

LITTLE-KNOWN FACT, ASTRONAUTS  
ARE ALL THROUGH THE SPACE

1871

01:25:03,320 --> 01:25:04,670

AGENCY.

1872

01:25:04,670 --> 01:25:06,960

WE WORK WITH THEM ON A REGULAR  
BASIS.

1873

01:25:06,960 --> 01:25:08,140

AND THEY'RE IN MANAGEMENT  
POSITIONS.

1874

01:25:08,140 --> 01:25:09,980

AND THEY INFLUENCE WHAT WE DO.

1875

01:25:09,980 --> 01:25:13,239

I MEAN, TO US, THEY'RE  
COWORKERS.

1876

01:25:13,239 --> 01:25:15,570

IT IS INTERESTING WHEN A  
QUESTION COMES UP ONCE IN A

1877

01:25:15,570 --> 01:25:18,620

WHILE AND YOU HAVE A GUY IN THE  
ROOM WHO'S ACTUALLY FLOWN, AND

1878

01:25:18,620 --> 01:25:21,670

LADIES IN THE ROOM WHO HAVE  
ACTUALLY FLOWN, AND IT'S NICE TO

1879

01:25:21,670 --> 01:25:23,600

GET THEIR INPUT.

1880

01:25:23,600 --> 01:25:25,810

FOR EXAMPLE, ONE OF THE THINGS  
WE'RE DESIGNING FOR THE LAUNCH

1881

01:25:25,810 --> 01:25:27,969

PAD, YOU MAY NOT BE ABLE TO SEE  
IT HERE, IT'S CALLED EMERGENCY

1882

01:25:27,969 --> 01:25:29,430

EGRESS SYSTEM.

1883

01:25:29,430 --> 01:25:31,800

ON THE SPACE SHUTTLE, IT'S  
BASICALLY A BASKET YOU JUMP INTO

1884

01:25:31,800 --> 01:25:33,890

AND GO DOWN THE SLIDE.

1885

01:25:33,890 --> 01:25:38,410

WE WERE GOING TO DO A ROLLER  
COASTER ESSENTIALLY ON THE ARIES

1886

01:25:38,410 --> 01:25:39,410

PROGRAM.

1887

01:25:39,410 --> 01:25:41,230

NOW WE'RE NOT SURE WHAT WE'RE  
GOING TO DO, BUT WITH WORK WITH

1888

01:25:41,230 --> 01:25:44,430

THE ASTRONAUTS TO HELP DICTATE  
WHAT THAT'S GOING TO LOOK LIKE.

1889

01:25:44,430 --> 01:25:47,360

IF YOU HAVE A PAD SITUATION  
BEFORE THEY LOAD IT OR EVEN

1890

01:25:47,360 --> 01:25:53,260

AFTER THEY'VE LOADED, THAT'S THE  
WAY WE GET THEM OFF THE PAD.

1891

01:25:53,260 --> 01:25:54,260

>> THANK YOU VERY MUCH.

1892

01:25:54,260 --> 01:25:58,250

REALLY APPRECIATE YOU COMING OUT  
TODAY, SCOTT.

1893

01:25:58,250 --> 01:25:59,780

>> ALL RIGHT.

1894

01:25:59,780 --> 01:26:01,320

THANK YOU.

1895

01:26:01,320 --> 01:26:02,860

>> THREE MIKES.

1896

01:26:02,860 --> 01:26:06,290

I DON'T KNOW WHICH ONE TO TALK  
INTO.

1897

01:26:06,290 --> 01:26:09,170

ANOTHER TRIVIA QUESTION OCCURRED  
TO ME WHILE SITTING HERE.

1898

01:26:09,170 --> 01:26:11,820

COMMERCIAL CREW AND CARGO  
PROGRAM OFFICE.

1899

01:26:11,820 --> 01:26:14,580

ANYONE KNOW WHAT THE ACRONYM FOR  
THAT IS?

1900

01:26:14,580 --> 01:26:16,220

C3P0.

1901

01:26:16,220 --> 01:26:20,510

I JUST LIKE "STAR WARS"  
REFERENCES.

1902

01:26:20,510 --> 01:26:23,150

THERE'S ACTUALLY AN R2.

1903

01:26:23,150 --> 01:26:28,780

CAN ANYONE TELL ME THAT ONE?

1904

01:26:28,780 --> 01:26:30,890

OKAY, ENOUGH ABOUT THE TRIVIA  
QUESTIONS.

1905

01:26:30,890 --> 01:26:33,100

LET ME INTRODUCE OUR NEXT  
SPEAKERS.

1906

01:26:33,100 --> 01:26:38,000

WE HAVE JOSE NUNEZ AND TODD  
ARNOLD WITH THE INTERNATIONAL

1907

01:26:38,000 --> 01:26:40,080

SPACE STATION.

1908

01:26:40,080 --> 01:26:41,990

GUYS?

1909

01:26:41,990 --> 01:26:45,800

THANK YOU.

1910

01:26:45,800 --> 01:26:46,800

>> SO LET'S SEE.

1911

01:26:46,800 --> 01:26:49,070

I HAVE BEEN PART OF THE  
INTERNATIONAL SPACE STATION FOR

1912

01:26:49,070 --> 01:26:51,000

THE PAST 15 YEARS.

1913

01:26:51,000 --> 01:26:54,500

BASICALLY BEEN A KEY MEMBER OF  
THE TEAM, HELPING IT TO BE

1914

01:26:54,500 --> 01:26:55,550

ASSEMBLED.

1915

01:26:55,550 --> 01:26:59,790

SO MY EXPERIENCES BASICALLY HAVE  
BEEN TO CHECK OUT AND TEST ALL

1916

01:26:59,790 --> 01:27:02,940

OF THE DIFFERENT SYSTEMS THAT  
WE'VE SENT TO THE ISS FROM

1917

01:27:02,940 --> 01:27:08,190

TRUSSES TO ORBITAL REPLACEMENT  
UNITS TO PAYLOADS.

1918

01:27:08,190 --> 01:27:12,180

SO AS YOU KNOW, WE BASICALLY  
HAVE TAKEN ALL THOSE PIECES THAT

1919

01:27:12,180 --> 01:27:14,210

HAVE GONE IN THE SPACE SHUTTLE.

1920

01:27:14,210 --> 01:27:18,910

WE ACTUALLY TEST THEM, INTEGRATE  
THEM, CHECK THEM, WHETHER IT BE

1921

01:27:18,910 --> 01:27:21,370

ELECTRICALLY, MECHANICALLY,  
FLUIDWISE, YOU NAME IT, WE'VE

1922

01:27:21,370 --> 01:27:23,090

DONE IT HERE.

1923

01:27:23,090 --> 01:27:25,360

BUT WE'RE NOT DONE JUST BECAUSE  
THE SHUTTLE IS OVER, RIGHT?

1924

01:27:25,360 --> 01:27:29,640

WE'RE STILL LAUNCHING THINGS IN  
DIFFERENT VEHICLES.

1925

01:27:29,640 --> 01:27:32,260

SO ONE OF THE KEY THINGS THAT  
WE'RE ALSO CONTINUING TO DO IS

1926

01:27:32,260 --> 01:27:35,550

TO SEND THE BIG ONES.

1927

01:27:35,550 --> 01:27:40,580

SO YOU KNOW WHERE THE BIG ORUs  
ARE FLOWN IN, RIGHT?

1928

01:27:40,580 --> 01:27:42,190

ANYONE?

1929

01:27:42,190 --> 01:27:43,800

HTV?

1930

01:27:43,800 --> 01:27:45,420

JAPANESE?

1931

01:27:45,420 --> 01:27:51,270

SO WE JUST -- TWO YEARS AGO, WE  
DID A LAUNCH CAMPAIGN OVER IN

1932

01:27:51,270 --> 01:27:56,050

JAPAN WHERE WE ACTUALLY SENT TWO  
ORBITAL REPLACEMENT UNITS THAT

1933

01:27:56,050 --> 01:27:59,890

ACTUALLY HAVE BEEN ALREADY  
INSTALLED INSIDE OR OUTSIDE OF

1934

01:27:59,890 --> 01:28:01,420

THE INTERNATIONAL SPACE STATION.

1935

01:28:01,420 --> 01:28:04,239

AND WE'RE CONTINUING TO DO THAT  
RIGHT NOW.

1936

01:28:04,239 --> 01:28:08,949

WE'RE INSTALLING FLIGHT SUPPORT  
EQUIPMENT ASSOCIATED WITH TWO

1937

01:28:08,949 --> 01:28:13,300

OTHER ORUs WHICH, AS YOU KNOW,  
THE ISS IS BASICALLY A

1938

01:28:13,300 --> 01:28:17,190

LEGO-TYPE, YOU KNOW, DESIGN.

1939

01:28:17,190 --> 01:28:21,910

SO THOSE LEGOS, ONCE THEY GET  
BROKEN OR THEY NEED REPLACEMENT,

1940

01:28:21,910 --> 01:28:25,790

WE ACTUALLY TAKE ONE FROM OUR  
LITTLE STORE THAT IS RIGHT THERE

1941

01:28:25,790 --> 01:28:30,060

NEXT TO THE TRUSS, AND WE PULL  
ONE OUT AND CHANGE IT OUT AND

1942

01:28:30,060 --> 01:28:32,980

PUT ANOTHER ONE BACK IN.

1943

01:28:32,980 --> 01:28:34,719

SO THAT'S BASICALLY WHAT WE'RE  
DOING.

1944

01:28:34,719 --> 01:28:37,120

INTEGRATING DIFFERENT ORUs.

1945

01:28:37,120 --> 01:28:42,510

THE TWO THAT WILL BE GOING UP IN

THE NEXT -- NOT THE NEXT HTV-3

1946

01:28:42,510 --> 01:28:46,320

MISSION BUT HTV-4, THE ONE THAT  
WE'RE WORKING ON, ONE THAT'S

1947

01:28:46,320 --> 01:28:50,630

CALLED THE MAIN BUS SWITCHING  
UNIT.

1948

01:28:50,630 --> 01:28:53,620

WHICH BASICALLY SWITCHES POWER  
BACK FROM THE DIFFERENT

1949

01:28:53,620 --> 01:28:54,620

BATTERIES.

1950

01:28:54,620 --> 01:28:57,710

AND THEN THE OTHER ONE IS THE  
UTA OR UMBILICAL TRANSFER

1951

01:28:57,710 --> 01:29:02,280

ASSEMBLY WHICH SIMPLY TAKES THE  
POWER FROM THE INBOARD TRUSSES

1952

01:29:02,280 --> 01:29:05,020

AND TAKES IT OUT TO THE OUTBOARD  
TRUSSES.

1953

01:29:05,020 --> 01:29:10,590

SO IT ACTUALLY HELPS TAKE THAT  
POWER BACK.

1954

01:29:10,590 --> 01:29:12,730

QUESTIONS OR CONTINUE TO TALK?

1955

01:29:12,730 --> 01:29:13,870

>> ANY QUESTIONS?

1956

01:29:13,870 --> 01:29:16,730  
FEEL FREE TO KEEP TALKING.

1957  
01:29:16,730 --> 01:29:18,170  
ANY QUESTIONS?

1958  
01:29:18,170 --> 01:29:20,260  
FOR JOSE?

1959  
01:29:20,260 --> 01:29:21,260  
>> SO LET'S SEE.

1960  
01:29:21,260 --> 01:29:23,580  
SO WE'RE CONTINUING TO INTEGRATE  
ITEMS TO THE ISS.

1961  
01:29:23,580 --> 01:29:26,930  
THAT'S GOING TO BE A CONTINUOUS  
BASIS.

1962  
01:29:26,930 --> 01:29:28,180  
UTILIZING DIFFERENT VEHICLES.

1963  
01:29:28,180 --> 01:29:31,230  
WE ARE ALSO SUPPORTING THE  
DIFFERENT PAYLOADS THAT WILL GO

1964  
01:29:31,230 --> 01:29:32,420  
UP.

1965  
01:29:32,420 --> 01:29:33,670  
IN THAT SENSE.

1966  
01:29:33,670 --> 01:29:38,940  
WE ACTUALLY HELP INTEGRATE THE  
SCAN PAYLOAD THAT WILL BE GOING

1967  
01:29:38,940 --> 01:29:43,920  
OUT OF JAPAN AGAIN, THE SCAN WAS

A PAYLOAD THAT WAS MANAGED OUT

1968

01:29:43,920 --> 01:29:45,560

OF GLENN RESEARCH CENTER.

1969

01:29:45,560 --> 01:29:50,030

AND THEY BASICALLY HIRED US TO  
HELP THEM IN JAPAN BASED ON OUR

1970

01:29:50,030 --> 01:29:51,030

EXPERTISE.

1971

01:29:51,030 --> 01:29:52,260

SO WE DID THAT AS WELL.

1972

01:29:52,260 --> 01:29:54,530

SO WE'RE CONTINUING TO SUPPORT  
THE ISS.

1973

01:29:54,530 --> 01:30:00,360

WE'RE CONTINUING TO HELP IT IN  
TERMS OF LOGISTICS, MAINTENANCE

1974

01:30:00,360 --> 01:30:01,480

OPERATIONS.

1975

01:30:01,480 --> 01:30:05,870

AND WE'RE CONTINUING TO DO SO  
UNTIL THE END.

1976

01:30:05,870 --> 01:30:08,690

THAT'S ONE OF THE MAIN DRIVERS  
WITH THE ISS.

1977

01:30:08,690 --> 01:30:11,760

TODD, DID YOU WANT TO COME UP  
HERE AND KIND OF MENTION

1978

01:30:11,760 --> 01:30:15,440

ANYTHING THAT YOU HAD?

1979

01:30:15,440 --> 01:30:16,550

>> SURE.

1980

01:30:16,550 --> 01:30:19,900

GOOD MORNING, EVERYBODY.

1981

01:30:19,900 --> 01:30:21,080

I'M TODD ARNOLD.

1982

01:30:21,080 --> 01:30:23,670

AND I'M CURRENTLY THE ACTING  
DEPUTY DIRECTOR FOR PUBLIC

1983

01:30:23,670 --> 01:30:25,550

AFFAIRS HERE AT KENNEDY SPACE  
CENTER.

1984

01:30:25,550 --> 01:30:30,820

I'VE BEEN IN THIS JOB FOR ABOUT  
THREE OR FOUR DAYS NOW.

1985

01:30:30,820 --> 01:30:33,390

THANK YOU.

1986

01:30:33,390 --> 01:30:36,010

SO PRIOR TO THIS, I WAS THE ISS  
STRATEGIC MANAGER.

1987

01:30:36,010 --> 01:30:39,219

SO JOSE HAS REPLACED ME IN THAT  
PARTICULAR FUNCTION HERE AT

1988

01:30:39,219 --> 01:30:40,489

KENNEDY SPACE CENTER.

1989

01:30:40,489 --> 01:30:44,449

AND PROBABLY WHAT I WOULD ADD TO

## WHAT JOSE WAS ALREADY SHARED

1990

01:30:44,449 --> 01:30:49,970

AROUND LAST MAY, MAY OF 2011, WE  
REACHED A VERY, VERY REMARKABLE

1991

01:30:49,970 --> 01:30:52,969

MILESTONE IN THE HISTORY OF THE  
INTERNATIONAL SPACE STATION.

1992

01:30:52,969 --> 01:30:55,780

AND THAT'S WHAT'S CALLED  
ASSEMBLY COMPLETE.

1993

01:30:55,780 --> 01:30:58,790

BASICALLY ALL OF THE LEGOS HAD  
BEEN FINISHED.

1994

01:30:58,790 --> 01:31:02,000

AND SO NOW WHAT HAS HAPPENED IS  
WE'VE ENTERED INTO A NEW ERA IN

1995

01:31:02,000 --> 01:31:05,830

THE NATIONAL SPACE STATION, AND  
WE'RE CALLING THIS ERA ISS FULL

1996

01:31:05,830 --> 01:31:06,830

ASSEMBLY.

1997

01:31:06,830 --> 01:31:08,180

EXCUSE ME, FULL UTILIZATION.

1998

01:31:08,180 --> 01:31:09,469

FULL UTILIZATION.

1999

01:31:09,469 --> 01:31:12,870

SO AS WE GO INTO THE FULL  
UTILIZATION ERA, IT GIVES US AN

2000

01:31:12,870 --> 01:31:16,640  
OPPORTUNITY TO PLACE A WHOLE LOT  
MORE EMPHASIS ON THE ORIGINAL

2001  
01:31:16,640 --> 01:31:18,160  
END OF RESEARCH.

2002  
01:31:18,160 --> 01:31:21,570  
SO YOU'RE GOING TO START HEARING  
A LOT OUT THERE ABOUT THE

2003  
01:31:21,570 --> 01:31:24,449  
RESEARCH THAT HAS BEEN GOING ON  
AND WILL GO ON.

2004  
01:31:24,449 --> 01:31:27,030  
I WILL SAY FROM THE VERY  
BEGINNING OF HUMAN OCCUPANCY ON

2005  
01:31:27,030 --> 01:31:29,540  
THE SPACE STATION, WE BEGAN  
RESEARCH.

2006  
01:31:29,540 --> 01:31:33,170  
BUT AS YOU KNOW, THE CREW'S TIME  
WAS REALLY COMMITTED TO

2007  
01:31:33,170 --> 01:31:35,500  
ASSEMBLING THE VEHICLE AND  
MAINTAINING THE VEHICLE.

2008  
01:31:35,500 --> 01:31:38,160  
SO NOW THAT WE'RE DONE WITH THE  
ASSEMBLY, WE HAVE A LOT MORE

2009  
01:31:38,160 --> 01:31:41,320  
CREW AVAILABILITY TO CONDUCT THE  
RESEARCH SCIENCE.

2010  
01:31:41,320 --> 01:31:44,631

AND IN REGARDS TO THE RESEARCH  
SCIENCE, IT'S GOING TO COME IN A

2011

01:31:44,631 --> 01:31:45,631  
FEW FLAVORS.

2012

01:31:45,631 --> 01:31:49,550  
YOU'LL HAVE THE NASA RESEARCH,  
THOSE HARDCORE THINGS THAT NASA

2013

01:31:49,550 --> 01:31:52,969  
HAS BEEN CHARTERED TO GO DO FOR  
THE U.S. AND FOR THE WORLD.

2014

01:31:52,969 --> 01:31:56,760  
AND WE'LL BE DOING A LOT MORE  
HUMAN HEALTH RESEARCH,

2015

01:31:56,760 --> 01:31:59,140  
EXPLORATION, TECHNOLOGY.

2016

01:31:59,140 --> 01:32:01,970  
YOU'LL BEGIN HEARING A LOT ABOUT  
TECHNOLOGY DEMONSTRATIONS BEING

2017

01:32:01,970 --> 01:32:06,640  
DONE ON THIS WONDERFUL HUMAN  
OUTPOST AS WELL AS A LOT ON LIFE

2018

01:32:06,640 --> 01:32:08,580  
AND PHYSICAL SCIENCES.

2019

01:32:08,580 --> 01:32:11,199  
IN ADDITION TO THE NASA  
RESEARCH, YOU'VE PROBABLY HEARD

2020

01:32:11,199 --> 01:32:15,210  
A LOT ABOUT WHAT'S CALLED  
NATIONAL LAB RESEARCH.

2021

01:32:15,210 --> 01:32:19,469

SO THIS ESSENTIALLY TAKES THE  
U.S. ALLOCATION OF ON-ORBIT

2022

01:32:19,469 --> 01:32:22,530

ASSETS ON THE INTERNATIONAL  
SPACE STATION AND MAKES THOSE

2023

01:32:22,530 --> 01:32:27,430

ASSETS AVAILABLE, NOT JUST TO  
NASA, BUT TO OTHER GOVERNMENT

2024

01:32:27,430 --> 01:32:30,690

INSTITUTES SUCH AS NATIONAL  
INSTITUTES OF HEALTH, NATIONAL

2025

01:32:30,690 --> 01:32:35,700

SCIENCE FOUNDATION, USDA, AND  
THERE ARE OTHERS.

2026

01:32:35,700 --> 01:32:39,199

SO THE NATIONAL LAB WILL HAVE  
ITS OWN SET OF OBJECTIVES

2027

01:32:39,199 --> 01:32:41,890

INDEPENDENT OF NASA'S RESEARCH  
OBJECTIVES.

2028

01:32:41,890 --> 01:32:44,780

AND I'M SURE THERE WILL BE LOTS  
OF COLLABORATION ACROSS THE TWO

2029

01:32:44,780 --> 01:32:45,810

FRONTS.

2030

01:32:45,810 --> 01:32:49,210

ONGOING WILL ALSO BE THE  
INTERNATIONAL PARTNER RESEARCH.

2031

01:32:49,210 --> 01:32:51,969  
SO EACH OF THE PARTNERS THAT  
ASSISTED US WITH THE ASSEMBLY

2032  
01:32:51,969 --> 01:32:54,670  
THEY HAVE MODULES AND  
CAPABILITIES ON ORBIT.

2033  
01:32:54,670 --> 01:32:57,180  
AND SO THEY'VE GOT THEIR  
RESEARCH OBJECTIVES.

2034  
01:32:57,180 --> 01:33:00,900  
SO IF YOU CAN ENVISION A  
WONDERFUL LABORATORY OF

2035  
01:33:00,900 --> 01:33:04,540  
COLLABORATION THAT WOULD OCCUR  
AT A UNIVERSITY, WE NOW HAVE

2036  
01:33:04,540 --> 01:33:07,219  
THAT ON THIS HUMAN OUTPOST.

2037  
01:33:07,219 --> 01:33:09,690  
SO IT'S A GREAT TIME TO BE A  
PART OF THE PROGRAM.

2038  
01:33:09,690 --> 01:33:13,680  
IT'S A GREAT TIME TO TUNE IN AND  
TO FOLLOW SOME OF THE THINGS

2039  
01:33:13,680 --> 01:33:15,020  
THAT ARE GOING ON.

2040  
01:33:15,020 --> 01:33:17,890  
EDUCATION IS PROBABLY THE OTHER  
AREA THAT'S GOING TO BE VERY,

2041  
01:33:17,890 --> 01:33:20,500  
VERY ROBUST ON THE INTERNATIONAL

SPACE STATION.

2042

01:33:20,500 --> 01:33:26,000

SO EFFORTS ARE AFOOT TO CONTINUE  
ENGAGING STUDENTS AND TEACHERS

2043

01:33:26,000 --> 01:33:29,080

TO DO EXPERIMENTS ON THE GROUND  
CONCURRENT WITH THE KINDS OF

2044

01:33:29,080 --> 01:33:32,330

THINGS THAT ARE GOING ON ON THE  
INTERNATIONAL SPACE STATION.

2045

01:33:32,330 --> 01:33:33,430

SO I'LL STOP RIGHT THERE.

2046

01:33:33,430 --> 01:33:39,160

AND OPEN UP THE FLOOR FOR ANY  
QUESTIONS FOR JOSE OR ME.

2047

01:33:39,160 --> 01:33:40,160

>> FIRST QUESTION OVER HERE.

2048

01:33:40,160 --> 01:33:43,301

>> FIRST OF ALL, I COULD ASK 100  
QUESTIONS ABOUT THE SPACE

2049

01:33:43,301 --> 01:33:46,510

STATION BECAUSE THAT IS THE  
COOLEST THING EVER INVENTED.

2050

01:33:46,510 --> 01:33:50,969

BUT I GUESS MY FIRST ONE OR ONE  
OF THE ONES THAT I'M INTERESTED

2051

01:33:50,969 --> 01:33:53,820

IN IS TELL ME A LITTLE BIT ABOUT  
THE SCIENCE EXPERIMENTS THAT ARE

2052  
01:33:53,820 --> 01:33:54,820  
GOING ON.

2053  
01:33:54,820 --> 01:33:55,820  
AND I KNOW THAT THERE ARE SO  
MANY.

2054  
01:33:55,820 --> 01:33:58,880  
BUT, LIKE, THERE WAS A SPIDER  
BROUGHT UP.

2055  
01:33:58,880 --> 01:34:01,890  
AND THEY'RE, LIKE, GROWING  
PLANTS AND ALL KINDS OF THINGS.

2056  
01:34:01,890 --> 01:34:04,470  
SO MAYBE WHAT ARE SOME OF YOUR  
FAVORITES.

2057  
01:34:04,470 --> 01:34:05,470  
>> ABSOLUTELY.

2058  
01:34:05,470 --> 01:34:06,470  
LOTS OF EXPERIMENTS.

2059  
01:34:06,470 --> 01:34:08,620  
LET ME SAY THIS AS A TOP-LEVEL  
VIEW.

2060  
01:34:08,620 --> 01:34:12,760  
THE EXPERIMENTS KIND OF SPAN  
MULTIPLE RESEARCH DISCIPLINES.

2061  
01:34:12,760 --> 01:34:16,340  
SO YOU'LL HEAR ABOUT EXPERIMENTS  
IN AREAS OF MICROGRAVITY OR

2062  
01:34:16,340 --> 01:34:19,150  
COMBUSTION, SCIENCE, LIFE

SCIENCES.

2063

01:34:19,150 --> 01:34:22,420

NOW, INTERESTINGLY ENOUGH, OUR  
LIFE SCIENCES ARE BROKEN ACROSS

2064

01:34:22,420 --> 01:34:24,370

ABOUT THREE FIELDS.

2065

01:34:24,370 --> 01:34:26,060

YOU'VE GOT THE ANIMAL RESEARCH.

2066

01:34:26,060 --> 01:34:28,840

YOU'VE GOT THE PLANT RESEARCH.

2067

01:34:28,840 --> 01:34:32,920

YOU'VE GOT THE HUMAN RESEARCH  
AND ALL THREE OF THOSE AREAS

2068

01:34:32,920 --> 01:34:36,080

HAVE THEIR OWN MICROBIAL LEVELS  
OF RESEARCH.

2069

01:34:36,080 --> 01:34:38,460

SO YOU WILL HEAR QUITE A BIT.

2070

01:34:38,460 --> 01:34:41,150

SINCE YOU'RE HERE AT KENNEDY  
SPACE CENTER TODAY, I WILL TELL

2071

01:34:41,150 --> 01:34:44,650

YOU THAT KENNEDY SPACE CENTER'S  
CONTRIBUTION IN THAT PARTICULAR

2072

01:34:44,650 --> 01:34:49,260

ARENA OF LIFE SCIENCES IS  
PRIMARILY AN AREA OF PLANTS.

2073

01:34:49,260 --> 01:34:53,270

SO WE HAVE DEVELOPED WORKING  
WITH PARTNERS IN AND GRANTEES,

2074

01:34:53,270 --> 01:34:54,810  
UNIVERSITY GRANTEES.

2075

01:34:54,810 --> 01:34:58,880  
WE HAVE DEVELOPED A SUITE OF  
FLIGHT HARDWARE FACILITY AND

2076

01:34:58,880 --> 01:35:00,780  
SUBFACILITY CAPABILITIES.

2077

01:35:00,780 --> 01:35:03,100  
ESSENTIALLY PLANT GROWTH  
CHAMBERS.

2078

01:35:03,100 --> 01:35:06,179  
THE PLANTS, IN ORDER TO GROW IN  
SPACE, NEED CERTAIN

2079

01:35:06,179 --> 01:35:07,980  
ENVIRONMENTAL PARAMETERS.

2080

01:35:07,980 --> 01:35:10,860  
AND SO WE HAVE DEVELOPED  
HARDWARE TO MAINTAIN THOSE

2081

01:35:10,860 --> 01:35:11,860  
PARAMETERS.

2082

01:35:11,860 --> 01:35:16,310  
WE ARE LOOKING TO EXPAND THE  
OFFERINGS FOR THAT SUITE OF

2083

01:35:16,310 --> 01:35:18,630  
HARDWARE BROADER THAN LIFE  
SCIENCES, PERHAPS.

2084

01:35:18,630 --> 01:35:22,350  
IT MAY REQUIRE SOME UNIQUE  
SCIENCE INSERTS, BUT CERTAINLY

2085  
01:35:22,350 --> 01:35:25,929  
ANYTHING NEEDS A CONTROLLED  
ENVIRONMENT AT A SHOE BOX KIND

2086  
01:35:25,929 --> 01:35:29,869  
OF LEVEL, MAYBE, WOULD BE A  
TARGET AUDIENCE THERE.

2087  
01:35:29,869 --> 01:35:33,640  
>> YOU WANT TO TELL THEM ABOUT  
THE COLD APPLICATOR?

2088  
01:35:33,640 --> 01:35:36,550  
>> I WISH I COULD.

2089  
01:35:36,550 --> 01:35:38,360  
>> YOU KNOW, THERE'S A LOT OF  
DIFFERENT RESEARCHERS IN THE

2090  
01:35:38,360 --> 01:35:39,360  
ISS.

2091  
01:35:39,360 --> 01:35:42,500  
AND ONE OF THE THINGS THAT  
THEY'VE DONE RESEARCH WITH IS

2092  
01:35:42,500 --> 01:35:44,440  
TO -- WITH PLASMA.

2093  
01:35:44,440 --> 01:35:49,190  
AND AS YOU KNOW, MATTER EXISTS  
IN THREE DIFFERENT STATES,

2094  
01:35:49,190 --> 01:35:50,610  
SOLID, LIQUID AND GAS.

2095

01:35:50,610 --> 01:35:54,300

BUT THERE'S OTHER PLASMA STATES  
THAT'S KIND OF QUASI ONE WAY OR

2096

01:35:54,300 --> 01:35:55,430

THE OTHER.

2097

01:35:55,430 --> 01:35:59,170

SO THEY'VE ACTUALLY TAKEN THE  
UNDERSTANDING OF HOW PLASMA

2098

01:35:59,170 --> 01:36:03,170

WORKS UP IN THE ISS AND BROUGHT  
IT DOWN HERE AND HAVE DEVELOPED

2099

01:36:03,170 --> 01:36:05,880

AN APPLICATOR, AND THEY'RE GOING  
THROUGH CLINICAL TRIALS RIGHT

2100

01:36:05,880 --> 01:36:06,880

NOW.

2101

01:36:06,880 --> 01:36:09,020

SO SUCH APPLICATOR, YOU COULD  
ACTUALLY -- IF YOU HAVE A WOUND,

2102

01:36:09,020 --> 01:36:13,030

FOR EXAMPLE, KIND OF APPLY OR  
KIND OF HOVER OVER THE WOUND,

2103

01:36:13,030 --> 01:36:15,230

AND IT WOULD ACTUALLY HELP IT  
INCREASE ITS HEALING

2104

01:36:15,230 --> 01:36:17,100

CAPABILITIES.

2105

01:36:17,100 --> 01:36:19,680

AND THIS HAS BEEN VERY

SUCCESSFUL SO FAR WITH

2106

01:36:19,680 --> 01:36:20,739

DIABETICS.

2107

01:36:20,739 --> 01:36:24,390

AS YOU KNOW, WHEN THEY HAVE A  
WOUND, IT'S HARD TO HEAL.

2108

01:36:24,390 --> 01:36:27,730

SO INTERESTING THINGS LIKE THAT  
IS JUST KIND OF REALLY BRINGING

2109

01:36:27,730 --> 01:36:31,850

IT HOME BECAUSE THAT'S -- EVEN  
THOUGH IT'S IN SPACE, THE

2110

01:36:31,850 --> 01:36:37,270

LABORATORY IS REALLY FOR US DOWN  
HERE ON EARTH.

2111

01:36:37,270 --> 01:36:42,220

>> I WAS WONDERING, SINCE THE  
RETIREMENT OF SHUTTLE, WE HAVE

2112

01:36:42,220 --> 01:36:45,040

WAYS TO GET STUFF UP TO THE  
INTERNATIONAL STATION BUT NOT

2113

01:36:45,040 --> 01:36:46,840

MANY WAYS TO GET THINGS BACK.

2114

01:36:46,840 --> 01:36:50,560

AND WITH THE UPCOMING DRAGON  
CAPSULE, AT LEAST AS A CARGO

2115

01:36:50,560 --> 01:36:53,810

TRANSPORT AND THE ABILITY TO  
RETURN THINGS SAFELY TO EARTH,

2116  
01:36:53,810 --> 01:36:56,410  
HOW THAT WOULD BE UTILIZED AND  
KIND OF THE TOP PRIORITIES OF

2117  
01:36:56,410 --> 01:37:00,090  
WHAT EXPERIMENTS OR OBJECTS  
WOULD BE TAKEN BACK DOWN TO

2118  
01:37:00,090 --> 01:37:02,929  
EARTH TO THE INTERNATIONAL SPACE  
STATION.

2119  
01:37:02,929 --> 01:37:04,530  
>> YOU HIT ON AN INTERESTING  
POINT.

2120  
01:37:04,530 --> 01:37:06,580  
WHEN YOU'RE OPERATING IN A  
REMOTE ENVIRONMENT, THERE ARE

2121  
01:37:06,580 --> 01:37:08,340  
SOME CONSTRAINING PARAMETERS.

2122  
01:37:08,340 --> 01:37:13,130  
EARLIER I MENTIONED THE CREW  
AVAILABILITY AS A CONSTRAINT.

2123  
01:37:13,130 --> 01:37:17,239  
OBVIOUSLY, TRANSPORTATION  
BECOMES VERY CRITICAL BOTH UP

2124  
01:37:17,239 --> 01:37:19,110  
AND AS YOU'VE MENTIONED DOWN.

2125  
01:37:19,110 --> 01:37:23,650  
SO THE CURRENT PROFILE LOOKS  
FORWARD TO THE SPACE X SERIES

2126  
01:37:23,650 --> 01:37:27,350

ACTUALLY PROVIDING SOME DOWN  
MASS LIMITED.

2127

01:37:27,350 --> 01:37:31,381

IT'S NOT OF THE VOLUME THAT WE  
WOULD HAVE ENJOYED THE SPACE

2128

01:37:31,381 --> 01:37:33,920

SHUTTLE BUT LIMITED DOWN THAT.

2129

01:37:33,920 --> 01:37:37,200

NOT EVERY VISITING VEHICLE TO  
THE SPACE STATION WILL

2130

01:37:37,200 --> 01:37:39,890

NECESSARILY OFFER DOWNMASS.

2131

01:37:39,890 --> 01:37:43,239

SO WE'VE GOT TO BE VERY CAREFUL  
IN HOW WE MANIFEST THOSE

2132

01:37:43,239 --> 01:37:45,699

EXPERIMENTS THAT ARE RETURNING.

2133

01:37:45,699 --> 01:37:50,090

ONE OF THE MITIGATION EFFORTS  
THAT'S WORKED SUCCESSFULLY IS

2134

01:37:50,090 --> 01:37:53,530

WHAT WE'RE CALLING TELESCEINCE  
OR TELEMETRIC SCIENCES WHERE WE

2135

01:37:53,530 --> 01:38:00,660

TRY TO BUILD CAPABILITIES TO MAC  
IMIZE THE RETURN ON SCIENCE EVEN

2136

01:38:00,660 --> 01:38:02,600

WHILE YOU'RE STILL IN SPACE.

2137

01:38:02,600 --> 01:38:09,920  
SO WE CAN USE CAMERA SYSTEMS AND  
OUR TELEMETRY LINKS.

2138  
01:38:09,920 --> 01:38:13,040  
WE WERE ABLE TO DO THAT  
SUCCESSFULLY OVER THE PAST FEW

2139  
01:38:13,040 --> 01:38:14,040  
YEARS.

2140  
01:38:14,040 --> 01:38:18,070  
WE WERE ABLE TO UPLINK COMMANDS  
TO ADJUST ENVIRONMENTAL

2141  
01:38:18,070 --> 01:38:19,070  
CONTROLS.

2142  
01:38:19,070 --> 01:38:23,210  
SO AS TO NOT OVERTAX THE CREW'S  
LIMITED TIME.

2143  
01:38:23,210 --> 01:38:28,630  
>> WAIT FOR THE MIKE.

2144  
01:38:28,630 --> 01:38:31,590  
>> THIS IS MY BIGGEST CONCERN  
ABOUT THE FACT THAT ONE DAY,

2145  
01:38:31,590 --> 01:38:34,570  
WHEN I'M AN ASTRONAUT FOR YOU  
GUYS OR SPACE X OR WHOEVER, I

2146  
01:38:34,570 --> 01:38:37,340  
WANT TO KNOW IF I CAN BRING MY  
DOG UP THERE WITH ME.

2147  
01:38:37,340 --> 01:38:41,260  
HAVE YOU EVER HAD ASTRONAUTS,  
YOU KNOW, OR HAS THERE EVER BEEN

2148

01:38:41,260 --> 01:38:45,500

TALK ABOUT -- I KNOW IT'S NOT  
SCIENCE OR ANYTHING, THAT'S YOUR

2149

01:38:45,500 --> 01:38:46,500

PET.

2150

01:38:46,500 --> 01:38:48,659

HAS ANYONE EVER WANTED TO BRING  
THEIR PET UP THERE?

2151

01:38:48,659 --> 01:38:51,300

>> I HAVE NOT HEARD ANYTHING  
ABOUT SOMEONE ASKING TO BRING A

2152

01:38:51,300 --> 01:38:52,300

DOG.

2153

01:38:52,300 --> 01:38:54,540

THAT DOESN'T MEAN THE QUESTION  
HASN'T BEEN ASKED.

2154

01:38:54,540 --> 01:38:55,540

INSECTS?

2155

01:38:55,540 --> 01:38:57,500

>> FROGS, FISH.

2156

01:38:57,500 --> 01:38:59,659

>> KEEP IT FAMILY FRIENDLY?

2157

01:38:59,659 --> 01:39:00,659

>> THAT'S A GOOD QUESTION.

2158

01:39:00,659 --> 01:39:03,699

UNFORTUNATELY, I DON'T HAVE AN  
ANSWER FOR YOU, BUT I'M SURE

2159

01:39:03,699 --> 01:39:09,550

THERE'S SOMEONE OUT THERE THAT  
CAN.

2160

01:39:09,550 --> 01:39:11,390

>> IT'S FUNNY, SOMEONE  
COMPLAINED TO ME THE OTHER DAY,

2161

01:39:11,390 --> 01:39:12,620

WE GET ASKED THE SAME QUESTIONS  
OVER AGAIN.

2162

01:39:12,620 --> 01:39:15,300

THAT WAS A NEW ONE.

2163

01:39:15,300 --> 01:39:23,889

THANK YOU FOR THAT.

2164

01:39:23,889 --> 01:39:29,940

>> ON A LITTLE BIT SERIOUS NOTE,  
THE SOYUZ, CAN YOU GUYS TALK

2165

01:39:29,940 --> 01:39:33,010

ABOUT THEIR RECENT FAILURES AND  
HOW COMFORTABLE YOU GUYS ARE NOW

2166

01:39:33,010 --> 01:39:37,130

WITH THEIR LAUNCH CAPABILITY?

2167

01:39:37,130 --> 01:39:39,060

>> I DON'T HAVE ANY DATA ON THE  
SOYUZ ISSUE.

2168

01:39:39,060 --> 01:39:40,890

>> IT PROBABLY WOULD BE  
INAPPROPRIATE.

2169

01:39:40,890 --> 01:39:43,680

I'M NOT AN EXPERT IN THAT

PARTICULAR AREA.

2170

01:39:43,680 --> 01:39:46,980  
SUFFICE IT TO SAY THAT NASA HAS  
TO BALANCE ALL AVAILABLE

2171

01:39:46,980 --> 01:39:49,449  
TRANSPORTATION OPTIONS IN THERE.

2172

01:39:49,449 --> 01:39:52,820  
SO MAYBE SOMEONE SPEAKING LATER  
MIGHT BE ABLE TO SPEAK

2173

01:39:52,820 --> 01:39:55,949  
APPROPRIATELY IN THAT AREA.

2174

01:39:55,949 --> 01:39:57,010  
>> GREAT.

2175

01:39:57,010 --> 01:39:58,079  
OKAY.

2176

01:39:58,079 --> 01:40:04,100  
>> HI, I'M INTERESTED IN THE  
RAMIFICATIONS OF LONG DURATION

2177

01:40:04,100 --> 01:40:06,110  
SPACE TRAVEL ON MENTAL HEALTH.

2178

01:40:06,110 --> 01:40:09,800  
CAN YOU TELL ME ABOUT ANY  
EXPERIMENTS OR ANY FUTURE

2179

01:40:09,800 --> 01:40:13,650  
RESEARCH THAT NASA WILL BE DOING  
ON THE SPACE STATION OR EVEN AT

2180

01:40:13,650 --> 01:40:14,849  
A GROUNDS CENTER?

2181

01:40:14,849 --> 01:40:16,239

>> WELL, I WILL SAY THIS.

2182

01:40:16,239 --> 01:40:18,950

I'LL KEEP IT VERY HIGH LEVEL.

2183

01:40:18,950 --> 01:40:23,570

WITHIN THE RESEARCH FIELDS, ONE  
AREA IS HUMAN HEALTH AND

2184

01:40:23,570 --> 01:40:28,420

HABITABILITY OR PERFORMANCE, HOW  
WELL A HUMAN CAN PERFORM IN

2185

01:40:28,420 --> 01:40:30,210

REMOTE CONDITIONS.

2186

01:40:30,210 --> 01:40:34,110

THERE ARE A NUMBER OF QUESTIONS  
THAT ARE YET TO BE ANSWERED THAT

2187

01:40:34,110 --> 01:40:36,040

WE'VE BEEN WORKING ON FOR YEARS.

2188

01:40:36,040 --> 01:40:39,780

THAT IF WE ANSWER, THEN WE CAN  
FURTHER HUMAN EXPLORATION.

2189

01:40:39,780 --> 01:40:44,290

SO THERE'S AN ENTIRE DIVISION  
FOR HUMAN EXPLORATION.

2190

01:40:44,290 --> 01:40:46,190

IT'S HOUSED AT THE JOHNSON SPACE  
CENTER.

2191

01:40:46,190 --> 01:40:50,370

AND THEY'VE GOT A NUMBER OF

SCIENTISTS AND ENGINEERS THAT

2192

01:40:50,370 --> 01:40:53,320

ARE OFF WORKING THAT IN  
PARTNERSHIP WITH A NUMBER OF

2193

01:40:53,320 --> 01:40:54,900

GRANTEES.

2194

01:40:54,900 --> 01:40:58,640

AND I DON'T KNOW SPECIFIC  
ANSWERS ABOUT THE PSYCHOLOGY

2195

01:40:58,640 --> 01:41:02,280

EFFECTS THERE, BUT I BELIEVE  
THAT'S SOMETHING THAT IS BEING

2196

01:41:02,280 --> 01:41:03,280

LOOKED INTO.

2197

01:41:03,280 --> 01:41:07,960

I DO KNOW THAT IN PAST HISTORY,  
WE'VE LOOKED AT THINGS SUCH AS,

2198

01:41:07,960 --> 01:41:13,040

IS THERE AN EFFECT ON A HUMAN OF  
WATCHING A GREEN PLANT GROW, FOR

2199

01:41:13,040 --> 01:41:14,040

EXAMPLE, IN SPACE?

2200

01:41:14,040 --> 01:41:17,600

THERE HAVE BEEN SOME EFFORTS IN  
THAT AREA.

2201

01:41:17,600 --> 01:41:21,300

BUT THERE ARE SOME WEBSITES  
AVAILABLE FOR HUMAN RESEARCH

2202

01:41:21,300 --> 01:41:24,730  
WITHIN NASA, IF YOU SIMPLY  
GOOGLE NASA HUMAN RESEARCH, I

2203  
01:41:24,730 --> 01:41:29,090  
THINK YOU PROBABLY WOULD GET TO  
THAT AREA, OKAY?

2204  
01:41:29,090 --> 01:41:31,989  
>> ALL RIGHT.

2205  
01:41:31,989 --> 01:41:35,780  
I TEACH SECOND GRADE, GIFTED  
STUDENTS, SO THEY'RE 7 AND 8

2206  
01:41:35,780 --> 01:41:37,010  
YEARS OLD AND THEY'RE WATCHING.

2207  
01:41:37,010 --> 01:41:39,340  
SO I'VE BEEN ASKING QUESTIONS  
THAT THE KIDS WANT TO KNOW

2208  
01:41:39,340 --> 01:41:40,390  
ABOUT.

2209  
01:41:40,390 --> 01:41:44,150  
WHEN WE DO OUR UNIT ABOUT THE  
MOON, WE LEARNED ABOUT HOW IT

2210  
01:41:44,150 --> 01:41:47,490  
WAS A RACE BETWEEN THE SOVIETS  
AND THE UNITED STATES.

2211  
01:41:47,490 --> 01:41:49,860  
BUT NOW SPACE TRAVEL HAS  
CHANGED.

2212  
01:41:49,860 --> 01:41:52,530  
NOW IT'S AN INTERNATIONAL SPACE  
STATION.

2213

01:41:52,530 --> 01:41:54,739

AND I WONDERED IF YOU COULD TALK  
A LITTLE BIT ABOUT THAT

2214

01:41:54,739 --> 01:41:58,440

GLOBALIZATION OF SPACE  
EXPLORATION.

2215

01:41:58,440 --> 01:42:04,260

AND WHAT IT'S LIKE TO WORK WITH  
PEOPLE FROM ALL OVER THE WORLD.

2216

01:42:04,260 --> 01:42:08,710

>> SO, YOU KNOW, THIS HAS BEEN  
ONE OF THE LARGEST INTERNATIONAL

2217

01:42:08,710 --> 01:42:13,640

COLLABORATIONS PROJECTS EVER,  
YOU KNOW, THAT WE KNOW OF.

2218

01:42:13,640 --> 01:42:17,489

THIS HAS BEEN REALLY A CHALLENGE  
BUT IS THE WAY OF THE FUTURE.

2219

01:42:17,489 --> 01:42:21,010

WE REMEMBER TRYING TO WORK IN  
THE BEGINNING WITH THE JAPANESE

2220

01:42:21,010 --> 01:42:25,410

AND THE RUSSIANS AND CANADIANS  
AND THE EUROPEANS, EVERYBODY

2221

01:42:25,410 --> 01:42:28,350

BRINGS IN THEIR CULTURE,  
EVERYBODY BRINGS IN THEIR OWN

2222

01:42:28,350 --> 01:42:33,900

WAY OF SEEING THINGS OR  
ENGINEERING PERSPECTIVE.

2223

01:42:33,900 --> 01:42:37,040

YOU KNOW, TO BE HONEST WITH YOU,  
IT WAS AN INTERESTING, YOU KNOW,

2224

01:42:37,040 --> 01:42:38,040

START.

2225

01:42:38,040 --> 01:42:41,489

BECAUSE HOW DO YOU DEAL WITH ALL  
THESE CULTURES ALL AT ONCE?

2226

01:42:41,489 --> 01:42:44,110

TAKE THE EXAMPLE OF SOFTWARE  
CODE.

2227

01:42:44,110 --> 01:42:48,460

THERE'S ABOUT 4 MILLION LINES OF  
CODE.

2228

01:42:48,460 --> 01:42:53,040

SOME GERMANS WOULD HAVE WRITTEN  
SOME OTHER LANGUAGE CODE, THEN

2229

01:42:53,040 --> 01:42:58,120

ITALIANS AND CANADIANS, THEN ALL  
THE SOFTWARE CODE HAS TO BE

2230

01:42:58,120 --> 01:42:59,120

INTEGRATED.

2231

01:42:59,120 --> 01:43:00,960

SO HOW DO YOU DO THAT?

2232

01:43:00,960 --> 01:43:04,810

SO IT HAS BEEN A LEARNING  
PROCESS.

2233

01:43:04,810 --> 01:43:09,130

BUT ONE THAT WE'VE BEEN ABLE TO  
OVERCOME, TRY TO UNDERSTAND

2234

01:43:09,130 --> 01:43:11,590  
EVERYBODY'S DIFFERENCES,  
UNDERSTAND EACH OTHER'S

2235

01:43:11,590 --> 01:43:12,590  
CULTURES.

2236

01:43:12,590 --> 01:43:17,150  
AND I THINK WE HAVE BUILT SUCH A  
GREAT TEAM THROUGHOUT THE YEARS

2237

01:43:17,150 --> 01:43:19,710  
OF WORKING, YOU KNOW, ONE ON ONE  
WITH THEM.

2238

01:43:19,710 --> 01:43:24,080  
SO AS IT COMES -- YOU KNOW, AS  
THE MOON COMES IN TRYING TO

2239

01:43:24,080 --> 01:43:28,050  
GLOBALIZE THE EXPLORATION  
ACTIVITIES, WE'RE JUST GOING TO

2240

01:43:28,050 --> 01:43:31,600  
HAVE TO LEARN TO CONTINUE TO  
WORK TOGETHER BECAUSE OTHERWISE

2241

01:43:31,600 --> 01:43:34,340  
WE WILL NEVER GET THERE AGAIN.

2242

01:43:34,340 --> 01:43:36,610  
>> WHAT ADVICE WOULD YOU HAVE  
FOR MY SECOND GRADERS FOR HOW

2243

01:43:36,610 --> 01:43:40,850  
THEY COULD LEARN ABOUT CULTURES  
AND BE PREPARED FOR THIS GLOBAL

2244

01:43:40,850 --> 01:43:41,850

FUTURE?

2245

01:43:41,850 --> 01:43:42,949

>> LEARN ANOTHER LANGUAGE.

2246

01:43:42,949 --> 01:43:44,070

>> THANK YOU.

2247

01:43:44,070 --> 01:43:46,530

>> YOU DON'T FIND OUT -- YOU  
DON'T LEARN ABOUT A CULTURE

2248

01:43:46,530 --> 01:43:48,940

WITHOUT LEARNING ITS LANGUAGE.

2249

01:43:48,940 --> 01:43:52,510

>> ONE OTHER THING TO POINT OUT  
IN THAT AREA WOULD BE -- I'M

2250

01:43:52,510 --> 01:43:57,949

FINDING THAT THE CREW OFTENTIMES  
BEHAVE VERY MUCH LIKE SCIENTISTS

2251

01:43:57,949 --> 01:43:59,280

WITHIN LABORATORIES.

2252

01:43:59,280 --> 01:44:01,179

VERY EAGER TO COLLABORATE.

2253

01:44:01,179 --> 01:44:05,651

SO BY VIRTUE OF THAT ENVIRONMENT  
BEING THE WAY IT IS, I THINK IT

2254

01:44:05,651 --> 01:44:07,840

FOSTERS COLLABORATION.

2255

01:44:07,840 --> 01:44:12,850

>> I HAD A QUESTION.

2256

01:44:12,850 --> 01:44:17,969

I WOULD LOVE TO DO RESEARCH WITH  
NASA IN ANY SORT OF CAPACITY.

2257

01:44:17,969 --> 01:44:21,100

WHAT WOULD BE -- I'M NOT SURE IF  
THERE IS PARTICULARLY A QUESTION

2258

01:44:21,100 --> 01:44:25,110

THAT'S GOOD FOR YOU, BUT WHAT  
WOULD BE SOME STEPS THAT I

2259

01:44:25,110 --> 01:44:31,690

SHOULD TAKE TO BE ABLE TO SEE  
THAT THROUGH?

2260

01:44:31,690 --> 01:44:35,930

>> ONE THING WOULD BE TO KIND OF  
GET INTO THE NASA RESEARCH

2261

01:44:35,930 --> 01:44:37,519

ANNOUNCEMENTS.

2262

01:44:37,519 --> 01:44:39,730

>> THERE'S A SYSTEM CALLED  
INSPIRE.

2263

01:44:39,730 --> 01:44:42,980

IT'S WHERE NASA POSTS ITS  
RESEARCH ANNOUNCEMENTS.

2264

01:44:42,980 --> 01:44:45,620

THOSE ANNOUNCEMENTS FLOW FROM  
FUNDAMENTAL QUESTIONS.

2265

01:44:45,620 --> 01:44:47,760

LIKE I MENTIONED IN THE HUMAN

RESEARCH AREA THAT MUST BE

2266

01:44:47,760 --> 01:44:51,020

ANSWERED TO FURTHER HUMAN  
EXPLORATION.

2267

01:44:51,020 --> 01:44:52,750

THAT'S ONE PLACE TO START.

2268

01:44:52,750 --> 01:44:55,710

IF YOU ARE PARTNERED TODAY WITH  
A UNIVERSITY, IT'S LIKELY YOUR

2269

01:44:55,710 --> 01:44:59,850

UNIVERSITY HAS ALREADY  
SUBSCRIBED TO THAT OR MAYBE A

2270

01:44:59,850 --> 01:45:02,850

NETWORK OF ENGINEERING  
DISCIPLINES PERHAPS MIGHT BE

2271

01:45:02,850 --> 01:45:03,850

SUBSCRIBED.

2272

01:45:03,850 --> 01:45:04,950

THAT'S ONE PLACE TO START.

2273

01:45:04,950 --> 01:45:08,840

I WOULD ALSO ENCOURAGE ANY OF  
THE WEB-SAVVY PEOPLE TO BEGIN

2274

01:45:08,840 --> 01:45:13,420

COMBINING THE INTERNATIONAL SPACE  
STATION WEBSITE PAGES.

2275

01:45:13,420 --> 01:45:16,660

AND THEY ARE TUCKED UNDERNEATH  
THE NASA.GOV.

2276

01:45:16,660 --> 01:45:18,140  
LOTS OF INFORMATION THERE.

2277

01:45:18,140 --> 01:45:22,949  
THERE IS TARGETED SETS OF DATA  
FOR PEOPLE WHO ARE INTERESTED AS

2278

01:45:22,949 --> 01:45:24,260  
POTENTIAL RESEARCHERS.

2279

01:45:24,260 --> 01:45:27,679  
I'D ENCOURAGE YOU TO BEGIN  
THERE.

2280

01:45:27,679 --> 01:45:29,400  
>> WE HAVE TIME FOR ONE MORE  
QUESTION.

2281

01:45:29,400 --> 01:45:31,860  
OKAY, OVER HERE.

2282

01:45:31,860 --> 01:45:35,610  
>> YES, SO THIS IS FOR THE KIDS  
WATCHING THE EDUCATION CHANNEL.

2283

01:45:35,610 --> 01:45:37,800  
SO YOU KNOW RECENTLY WITH  
YOUTUBE SPACE LAB, TWO YOUNG

2284

01:45:37,800 --> 01:45:41,650  
AMERICANS WERE CHOSEN TO FLY  
THEIR EXPERIMENT ABOARD.

2285

01:45:41,650 --> 01:45:44,429  
AND SONNY WILLIAMS WILL WORK  
WITH US.

2286

01:45:44,429 --> 01:45:46,719  
CAN YOU TALK A LITTLE BIT, IF  
YOU KNOW, ABOUT THE PROCESS THAT

2287

01:45:46,719 --> 01:45:49,830

THE KIDS TULLY GET TO GO THROUGH  
AND MORE IMPORTANTLY HOW KIDS

2288

01:45:49,830 --> 01:45:53,180

TODAY CAN SEEK OUT THOSE OTHER  
OPPORTUNITIES?

2289

01:45:53,180 --> 01:45:55,830

WILL THE PROGRAM BE REPEATED, OR  
THERE ARE SIMILAR PROGRAMS THAT

2290

01:45:55,830 --> 01:45:57,789

KIDS CAN LOOK FORWARD TO?

2291

01:45:57,789 --> 01:46:00,400

>> SURE, I'LL MAYBE MENTION A  
COUPLE PROGRAMS THAT HAVE BEEN

2292

01:46:00,400 --> 01:46:03,900

SUCCESSFUL IN THE EDUCATION  
ARENA ASSOCIATED WITH SPACE

2293

01:46:03,900 --> 01:46:04,900

STATION.

2294

01:46:04,900 --> 01:46:07,429

WE'VE HAD SEVERAL, ACTUALLY.

2295

01:46:07,429 --> 01:46:10,140

THE COMMERCIAL, GENERIC,  
BIOPROCESSING APPARATUS, SCIENCE

2296

01:46:10,140 --> 01:46:11,140

INSERTS, CGBA.

2297

01:46:11,140 --> 01:46:13,410

A LONG WAY TO SAY THAT.

2298

01:46:13,410 --> 01:46:16,840

THAT WAS AN EDUCATIONAL PAYLOAD  
THAT WAS DESIGNED TO FOSTER

2299

01:46:16,840 --> 01:46:18,560

INTEREST IN K-12 STUDENTS.

2300

01:46:18,560 --> 01:46:23,010

AND IN THAT CASE, WE WERE TRYING  
TO ATTRACT THEM TO THE SCIENCE,

2301

01:46:23,010 --> 01:46:26,980

TECHNOLOGY, ENGINEERING AND MATH  
FIELDS, POTENTIALLY AS CAREER

2302

01:46:26,980 --> 01:46:28,750

OPTIONS FOR THEM.

2303

01:46:28,750 --> 01:46:30,880

AND THEY WERE ALLOWED WITH THIS  
PARTICULAR EXPERIMENT TO

2304

01:46:30,880 --> 01:46:35,429

PARTICIPATE IN WHAT WE CALLED  
NEAR REALTIME RESEARCH,

2305

01:46:35,429 --> 01:46:38,030

CONCURRENT WITH WHAT WAS GOING  
ON ON THE SPACE STATION.

2306

01:46:38,030 --> 01:46:41,500

WE'VE HAD OTHERS, EARTH CAM,  
WHICH IS EARTH KNOWLEDGE

2307

01:46:41,500 --> 01:46:43,730

ACQUIRED BY MIDDLE SCHOOL  
STUDENTS, TARGETED THE MIDDLE

2308

01:46:43,730 --> 01:46:44,770  
SCHOOL STUDENTS.

2309  
01:46:44,770 --> 01:46:46,620  
AND I BELIEVE WITH THAT  
PARTICULAR ONE, THE STUDENTS

2310  
01:46:46,620 --> 01:46:50,010  
WERE ACTUALLY INVOLVED IN  
OPERATING A DIGITAL CAMERA THAT

2311  
01:46:50,010 --> 01:46:52,179  
WAS ON BOARD THE INTERNATIONAL  
SPACE STATION.

2312  
01:46:52,179 --> 01:46:54,040  
SO THAT WAS ONE WAY TO BRING  
THEM IN.

2313  
01:46:54,040 --> 01:46:57,250  
I THINK THEY WERE LOOKING AT  
VARIOUS GEOGRAPHICAL TARGETS IN

2314  
01:46:57,250 --> 01:46:58,429  
THAT CASE.

2315  
01:46:58,429 --> 01:47:01,179  
WE'VE HAD, I BELIEVE, SOMETHING  
CALLED KIDS IN MICROGRAVITY

2316  
01:47:01,179 --> 01:47:04,929  
EXPERIMENT CHALLENGE, KIDS IN  
MICRO-G, THAT WAS MAYBE

2317  
01:47:04,929 --> 01:47:06,719  
TARGETING GRADES 5 THROUGH 8.

2318  
01:47:06,719 --> 01:47:07,980  
AND THE LIST GOES ON AND ON.

2319

01:47:07,980 --> 01:47:09,530

SO WE'VE HAD A NUMBER OF THOSE.

2320

01:47:09,530 --> 01:47:13,140

ALSO, AS I DIRECTED THE OTHER  
GENTLEMAN TO THE INTERNATIONAL

2321

01:47:13,140 --> 01:47:18,410

SPACE STATION WEBSITE PAGES, AND  
NASA.GOV, THERE ARE TAGS THERE

2322

01:47:18,410 --> 01:47:20,680

FOR NASA EDUCATION OUTREACH.

2323

01:47:20,680 --> 01:47:23,640

THERE ARE TAGS FOR -- AND  
SPECIFIC PAGES TARGETING

2324

01:47:23,640 --> 01:47:26,480

TEACHERS WHO CAN BRING  
CURRICULUM PERHAPS INTO THE

2325

01:47:26,480 --> 01:47:31,350

CLASSROOM OR CERTAINLY USE SOME  
OF THE PUBLISHED INFORMATION TO

2326

01:47:31,350 --> 01:47:33,929

SUPPLEMENT THE CURRICULUM THEY  
ALREADY HAVE IN THEIR CLASSROOM.

2327

01:47:33,929 --> 01:47:37,360

AND THERE ARE SOME THINGS FOR  
SMALLER KIDS AS WELL.

2328

01:47:37,360 --> 01:47:38,360

>> OKAY.

2329

01:47:38,360 --> 01:47:39,360

THANK YOU VERY MUCH.

2330

01:47:39,360 --> 01:47:53,719

APPRECIATE YOU GUYS COMING OUT  
TODAY.

2331

01:47:53,719 --> 01:47:56,100

I'LL CHOOSE RED.

2332

01:47:56,100 --> 01:47:59,280

YOU KNOW, IT WAS JUST NOTICED ON  
TWITTER THAT WE'RE TRENDING --

2333

01:47:59,280 --> 01:48:01,219

NOW WE HAVE SPAM.

2334

01:48:01,219 --> 01:48:03,170

SO THAT'S THE CONSEQUENCE.

2335

01:48:03,170 --> 01:48:06,750

SO YOU'LL SEE, IF YOU LOOK  
AT #NASASOCIAL, YOU'LL SEE SPAM.

2336

01:48:06,750 --> 01:48:08,540

THAT'S OKAY.

2337

01:48:08,540 --> 01:48:15,140

NOW TO DESCRIBE THE  
PEOPLE, #NASASOCIALSPIKES,

2338

01:48:15,140 --> 01:48:16,710

THAT'S COOL, DESCRIBING WHAT WE  
ARE.

2339

01:48:16,710 --> 01:48:21,700

OUR NEXT AND LAST SPEAKER BEFORE  
BREAK, OUR FOOD IS HERE.

2340

01:48:21,700 --> 01:48:24,989

AND I KNOW PROBABLY ALL OF YOU

ARE EAGER TO USE THE POTTY,

2341

01:48:24,989 --> 01:48:25,989

PERHAPS.

2342

01:48:25,989 --> 01:48:29,150

SO OUR NEXT SPEAKER IS A FRIEND  
AND COLLEAGUE OF MINE AT JOHNSON

2343

01:48:29,150 --> 01:48:30,380

SPACE CENTER.

2344

01:48:30,380 --> 01:48:33,930

HE IS FORMERLY A CBS REPORTER.

2345

01:48:33,930 --> 01:48:37,590

NOW HE IS HERE AT JOHNSON DOING  
COMMENTARY AND LOTS OF OTHER

2346

01:48:37,590 --> 01:48:38,590

THINGS AS WELL.

2347

01:48:38,590 --> 01:48:41,050

BUT ONE THING HE DOES, HE'S  
WORKED THE SHUTTLE.

2348

01:48:41,050 --> 01:48:44,510

AND HE'S GOING TO BE DOING THE  
SPACE X LAUNCH TOMORROW.

2349

01:48:44,510 --> 01:48:46,470

AND ALSO THE MISSION.

2350

01:48:46,470 --> 01:48:49,860

ONE THING THAT YOU'LL ALSO HEAR  
HIM ON, HE FLIES TO RUSSIA AND

2351

01:48:49,860 --> 01:48:51,680

DOES COMMENTARY FOR THE SOYUZ.

2352

01:48:51,680 --> 01:48:55,910

HE DOES ANOTHER ROTATION, AND  
THEY ARE A DREAM TEAM FOR NASA.

2353

01:48:55,910 --> 01:49:00,679

LET ME INTRODUCE YOU TO JOSH  
BARLEY.

2354

01:49:00,679 --> 01:49:04,650

>> GOOD MORNING, EVERYBODY.

2355

01:49:04,650 --> 01:49:06,160

YOU GUYS HAVING FUN DOWN HERE AT  
KENNEDY?

2356

01:49:06,160 --> 01:49:07,960

I LOVE THE JOHNSON SPACE CENTER.

2357

01:49:07,960 --> 01:49:10,300

IT'S ALWAYS FUN TO COME DOWN TO  
FLORIDA AND HANG OUT WITH OUR

2358

01:49:10,300 --> 01:49:12,370

FRIENDS DOWN HERE.

2359

01:49:12,370 --> 01:49:13,719

IT'S GOOD THAT YOU'RE DOWN HERE  
FOR THE SPACE X LAUNCH.

2360

01:49:13,719 --> 01:49:16,320

I'M GOING TO TALK ABOUT SORT OF  
WHAT YOU HEARD A MINUTE AGO

2361

01:49:16,320 --> 01:49:20,200

ABOUT HOW OUR JOBS HAVE CHANGED  
IN PUBLIC AFFAIRS AND TALKING ON

2362

01:49:20,200 --> 01:49:21,989

NASA-TV SINCE THE SHUTTLE.

2363

01:49:21,989 --> 01:49:24,570

OBVIOUSLY WE WERE ON THE AIR FOR  
NINE HOURS DURING THE SHUTTLE

2364

01:49:24,570 --> 01:49:27,010

AND EVERYBODY KNEW WHAT WE DID.

2365

01:49:27,010 --> 01:49:28,650

STATION'S A LITTLE BIT  
DIFFERENT.

2366

01:49:28,650 --> 01:49:30,640

YOU KNOW, BACK UP UNTIL ABOUT A  
YEAR AND A HALF AGO, WE WERE

2367

01:49:30,640 --> 01:49:32,219

REALLY FOCUSED ON BUILDING IT.

2368

01:49:32,219 --> 01:49:35,409

SO US COMMENTATORS WOULD TALK  
ABOUT HOW BIG THE MODULES WERE,

2369

01:49:35,409 --> 01:49:38,150

HOW THEY PUT THEM TOGETHER.

2370

01:49:38,150 --> 01:49:39,390

WE GOT VERY USED TO THAT.

2371

01:49:39,390 --> 01:49:42,020

AND THESE DAYS WE TALK ABOUT HOW  
THE STATION CREW IS USING IT

2372

01:49:42,020 --> 01:49:43,400

WHICH IS DIFFERENT.

2373

01:49:43,400 --> 01:49:46,610

WE TALK A LOT ABOUT THE SCIENCE

WHICH FOR PEOPLE LIKE US THAT

2374

01:49:46,610 --> 01:49:49,860

ARE JOURNALISM MAJORS AND NOT  
ENGINEERS AND NOT SCIENTISTS IS

2375

01:49:49,860 --> 01:49:51,250

A LITTLE DIFFICULT SOMETIMES.

2376

01:49:51,250 --> 01:49:53,440

USUALLY IF THERE'S A WORD I  
CANNOT PRONOUNCE, I SKIP RIGHT

2377

01:49:53,440 --> 01:49:55,770

OVER IT AND KEEP TALKING.

2378

01:49:55,770 --> 01:49:57,739

SO, YOU KNOW, BUT IT'S COOL  
STUFF.

2379

01:49:57,739 --> 01:50:00,000

IT'S JUST A DIFFERENT DEAL  
BECAUSE, YOU KNOW, HOW DO YOU

2380

01:50:00,000 --> 01:50:01,719

TALK TO THE PUBLIC WHENEVER  
THEY'RE USED TO SEEING THE

2381

01:50:01,719 --> 01:50:04,250

SHUTTLE WHERE THERE'S SMOKE AND  
THERE'S FIRE AND THE DRAMA OF

2382

01:50:04,250 --> 01:50:08,140

THAT AND THEN GET THEM AS  
EQUALLY ENGAGED WITH THE SPACE

2383

01:50:08,140 --> 01:50:10,219

STATION, YOU KNOW, WHEN IT  
DOESN'T LAUNCH.

2384

01:50:10,219 --> 01:50:11,219

IT'S JUST UP THERE.

2385

01:50:11,219 --> 01:50:13,659

THE STUFF THAT THE CREWS ARE  
DOING IS COMPLETELY COOL.

2386

01:50:13,659 --> 01:50:14,659

WE TALK ABOUT THE SCIENCE.

2387

01:50:14,659 --> 01:50:17,909

WHAT WE'VE LEARNED ABOUT WHAT  
THE HUMAN BODY DOES UP IN SPACE

2388

01:50:17,909 --> 01:50:18,909

IS JUST FANTASTIC.

2389

01:50:18,909 --> 01:50:22,510

AND IF WE'RE GOING EVERY GOING  
TO GO TO MARS, WE'VE GOT TO

2390

01:50:22,510 --> 01:50:26,200

FIGURE THAT OUT SO THE CREWS ARE  
FIGURING OUT THAT KIND OF STUFF.

2391

01:50:26,200 --> 01:50:27,480

IT'S A DIFFERENT TIME.

2392

01:50:27,480 --> 01:50:30,409

OBVIOUSLY WITH SPACE X  
LAUNCHING, WE'RE HAVING TO LEARN

2393

01:50:30,409 --> 01:50:33,010

A NEW VEHICLE, A NEW SPACECRAFT.

2394

01:50:33,010 --> 01:50:35,020

FOR US COMMENTATORS, WHENEVER WE  
SIT DOWN TO TALK ABOUT A

2395

01:50:35,020 --> 01:50:37,180

MISSION, IT'S LIKE WE ARE  
STUDYING FOR A TEST.

2396

01:50:37,180 --> 01:50:40,920

WE HAVE REAMS OF PAPERS WE HAVE  
TO READ THROUGH AND STUDY AND

2397

01:50:40,920 --> 01:50:44,430

MEMORIZE THE STUFF AND HOPEFULLY  
GO ON NASA-TV AND GET IT RIGHT

2398

01:50:44,430 --> 01:50:45,969

FOR YOU GUYS.

2399

01:50:45,969 --> 01:50:49,320

SO THIS SPACE X, IT'S BEEN  
REALLY INTERESTING, REALLY FUN

2400

01:50:49,320 --> 01:50:52,690

FOR US TO KIND OF LEARN A NEW  
SPACECRAFT AND TO INTEGRATE THAT

2401

01:50:52,690 --> 01:50:55,340

INTO ALL THE OTHER THINGS WE  
TALK ABOUT LIKE THE JAPANESE HTV

2402

01:50:55,340 --> 01:50:59,929

CARGO CRAFT, THE EUROPEANS, AND  
THE RUSSIANS HAVE THEIR SOYUZ

2403

01:50:59,929 --> 01:51:00,929

AND THEIR PROGRESS.

2404

01:51:00,929 --> 01:51:03,680

SO GEORGE DILLARD IS GOING TO BE  
DOING THE LAUNCH BRIGHT AND

2405

01:51:03,680 --> 01:51:04,680

EARLY TOMORROW MORNING.

2406

01:51:04,680 --> 01:51:06,960  
THEN I'LL HEAD BACK TO HOUSTON  
AND DO THE MISSION.

2407

01:51:06,960 --> 01:51:08,610  
WE'LL SEE HOW THIS FLIGHT GOES.

2408

01:51:08,610 --> 01:51:10,429  
YOU GUYS CAN ASK ME ANYTHING.

2409

01:51:10,429 --> 01:51:13,949  
I'M WILLING TO TAKE ANY  
QUESTIONS.

2410

01:51:13,949 --> 01:51:14,949  
ANYTHING.

2411

01:51:14,949 --> 01:51:16,289  
GO AHEAD.

2412

01:51:16,289 --> 01:51:20,730  
>> WAIT FOR THE MIKE.

2413

01:51:20,730 --> 01:51:25,340  
>> AS LONG AS THERE'S AN  
ANYTHING OPPORTUNITY, AND YOU'RE

2414

01:51:25,340 --> 01:51:26,340  
IN PUBLIC AFFAIRS.

2415

01:51:26,340 --> 01:51:27,340  
>> RIGHT.

2416

01:51:27,340 --> 01:51:28,340  
>> SO THIS WILL WORK FOR YOU.

2417

01:51:28,340 --> 01:51:29,340

>> OKAY.

2418

01:51:29,340 --> 01:51:34,030

>> A COUPLE WEEKS AGO, AN  
ENGINEER, UNDISCLOSED ENGINEER

2419

01:51:34,030 --> 01:51:38,570

SET UP THE BUILD THE  
ENTERPRISE.ORG SITE WITH, LIKE,

2420

01:51:38,570 --> 01:51:42,610

ALL THE STUFF TO BUILD A  
FIRST-GENERATION ENTERPRISE-TYPE

2421

01:51:42,610 --> 01:51:45,140

SHIP WITHIN 20 YEARS.

2422

01:51:45,140 --> 01:51:46,140

ANY COMMENT ON THAT?

2423

01:51:46,140 --> 01:51:47,470

>> YOU KNOW, IT'S FUNNY.

2424

01:51:47,470 --> 01:51:48,780

OKAY, THIS IS A TRUE STORY.

2425

01:51:48,780 --> 01:51:52,170

I GOT A QUESTION ABOUT A YEAR  
AND A HALF AGO FROM A MAGAZINE

2426

01:51:52,170 --> 01:51:54,949

SAYING, YOU KNOW, WE NEED AN  
OFFICIAL COMMENT FROM NASA ABOUT

2427

01:51:54,949 --> 01:51:56,980

HOW MUCH IT WOULD COST TO BUILD  
THE ENTERPRISE.

2428

01:51:56,980 --> 01:51:58,590  
WELL, WE DON'T KNOW.

2429  
01:51:58,590 --> 01:51:59,590  
YOU KNOW.

2430  
01:51:59,590 --> 01:52:03,010  
SO MY ANSWER, NOT THAT I'M A  
TREKKIE, BUT MY ANSWER WAS

2431  
01:52:03,010 --> 01:52:06,489  
ANYBODY THAT FOLLOWS "STAR TREK"  
KNOWS THAT THERE'S NO MONEY IN

2432  
01:52:06,489 --> 01:52:07,489  
THAT TIME PERIOD.

2433  
01:52:07,489 --> 01:52:08,510  
SO IT'S FREE.

2434  
01:52:08,510 --> 01:52:09,880  
>> WELL PLAYED.

2435  
01:52:09,880 --> 01:52:11,190  
>> SEE?

2436  
01:52:11,190 --> 01:52:17,739  
I DO MY JOB WELL.

2437  
01:52:17,739 --> 01:52:20,360  
NEXT QUESTION.

2438  
01:52:20,360 --> 01:52:21,670  
YEAH.

2439  
01:52:21,670 --> 01:52:23,330  
>> YOU SAID YOU WENT TO  
JOURNALISM SCHOOL.

2440

01:52:23,330 --> 01:52:25,120

I WAS JUST CURIOUS IF YOU COULD  
GIVE A LITTLE BIT OF A

2441

01:52:25,120 --> 01:52:29,389

BACKGROUND OF HOW YOU ENDED UP  
DOING COMMENTARY FOR NASA.

2442

01:52:29,389 --> 01:52:31,330

>> THAT'S AN INTERESTING STORY.

2443

01:52:31,330 --> 01:52:32,330

OKAY.

2444

01:52:32,330 --> 01:52:34,370

SO YEAH, I WENT TO JOURNALISM  
SCHOOL THINKING I WAS ACTUALLY

2445

01:52:34,370 --> 01:52:35,949

GOING TO GO BE A LAWYER.

2446

01:52:35,949 --> 01:52:40,090

AND I ENDED UP GETTING -- IT'S  
FUNNY BECAUSE I STARTED OUT IN

2447

01:52:40,090 --> 01:52:41,320

RADIO, ACTUALLY.

2448

01:52:41,320 --> 01:52:44,520

JUST AS A LARK DOWN IN BRYAN,  
COLLEGE STATION, TEXAS.

2449

01:52:44,520 --> 01:52:47,190

AND THE RADIO STATION I WORKED  
FOR HAD A PARTNERSHIP WITH THE

2450

01:52:47,190 --> 01:52:48,480

CBS AFFILIATE.

2451

01:52:48,480 --> 01:52:51,530

AND THEY APPROACHED ME TO GO DO  
AN INTERNSHIP WHICH EVERYBODY

2452

01:52:51,530 --> 01:52:52,530

NEEDS AN INTERNSHIP.

2453

01:52:52,530 --> 01:52:55,040

SO I DID THAT, NOT REALLY  
KNOWING THAT I WOULD END UP

2454

01:52:55,040 --> 01:52:56,670

DOING THIS ONE OF THESE DAYS.

2455

01:52:56,670 --> 01:52:59,659

YOU KNOW, IT'S FUNNY HOW YOUR  
LIFE TAKES TURNS.

2456

01:52:59,659 --> 01:53:02,429

NOW, PARALLEL TO THAT BACK  
WHENEVER I WAS -- I THINK

2457

01:53:02,429 --> 01:53:04,500

THERE'S SOMEBODY IN HERE THAT  
TEACHES SECOND GRADE.

2458

01:53:04,500 --> 01:53:05,500

WAS IT YOU?

2459

01:53:05,500 --> 01:53:06,500

OKAY.

2460

01:53:06,500 --> 01:53:08,420

SO MY MOM AND DAD TOOK ME ON A  
TRIP WHEN I WAS A LITTLE KID

2461

01:53:08,420 --> 01:53:11,160

DOWN TO HOUSTON BECAUSE MY DAD'S  
COMPANY'S ALWAYS BEEN DOWN

2462

01:53:11,160 --> 01:53:12,160

THERE.

2463

01:53:12,160 --> 01:53:14,160

I GREW UP IN EAST TEXAS.

2464

01:53:14,160 --> 01:53:16,040

BACK THEN YOU COULD ACTUALLY  
WALK AROUND THE JOHNSON SPACE

2465

01:53:16,040 --> 01:53:18,440

CENTER A LITTLE MORE FREELY THAN  
YOU CAN TODAY.

2466

01:53:18,440 --> 01:53:20,659

BUT WE TOOK A TOUR.

2467

01:53:20,659 --> 01:53:24,000

AND THEY TOOK US INTO THIS  
BUILDING THAT WAS WHAT WE NOW

2468

01:53:24,000 --> 01:53:26,680

CALL THE SPACE VEHICLE MOCKUP  
FACILITY.

2469

01:53:26,680 --> 01:53:30,820

AND I ACTUALLY ENDED UP MEETING  
AT A VERY YOUNG AGE THE

2470

01:53:30,820 --> 01:53:33,060

"CHALLENGER" CREW, SOME OF THEM.

2471

01:53:33,060 --> 01:53:36,850

AND THAT SET THE COURSE OF MY  
LIFE, THAT ONE MOMENT.

2472

01:53:36,850 --> 01:53:39,050

SO THAT'S WHY I'M REALLY

PASSIONATE ABOUT REACHING OUT TO

2473

01:53:39,050 --> 01:53:40,993

KIDS AND STUDENTS BECAUSE YOU  
NEVER KNOW WHAT YOU'RE GOING TO

2474

01:53:40,993 --> 01:53:43,390

INSPIRE THEM TO DO.

2475

01:53:43,390 --> 01:53:45,730

YOU KNOW, I DIDN'T REALIZE THAT  
WOULD SET THE SEED FOR WHAT

2476

01:53:45,730 --> 01:53:49,230

WOULD HAPPEN TO ME LATER ON IN  
MY LIFE, BUT IT DID.

2477

01:53:49,230 --> 01:53:51,350

LIKE EVERY OTHER EMPLOYEE  
WORKING FOR NASA BACK WHEN I WAS

2478

01:53:51,350 --> 01:53:58,080

IN DALLAS, I STUCK MY RESUME IN,  
AND IT HIT.

2479

01:53:58,080 --> 01:54:01,800

WHICH IS VERY -- I MEAN, IT'S  
VERY SMALL, BUT IT DID.

2480

01:54:01,800 --> 01:54:04,060

AND LUCKY ENOUGH, I GOT THE  
POSITION.

2481

01:54:04,060 --> 01:54:06,821

AND I CAME AT A VERY INTERESTING  
TIME DURING HISTORY WHEN THE

2482

01:54:06,821 --> 01:54:08,890

SHUTTLE WAS RETIRING AND WE'RE  
STARTING THE STUFF WITH THE

2483

01:54:08,890 --> 01:54:10,480

STATION AND THESE COMMERCIAL  
PARTNERS.

2484

01:54:10,480 --> 01:54:11,790

YOU KNOW, IT'S A LITTLE BIT OF  
LUCK.

2485

01:54:11,790 --> 01:54:13,310

A LITTLE BIT OF PLANNING.

2486

01:54:13,310 --> 01:54:17,880

YOU KNOW, YOU NEVER KNOW HOW  
THINGS ARE GOING TO WORK OUT.

2487

01:54:17,880 --> 01:54:18,880

>> HI.

2488

01:54:18,880 --> 01:54:22,060

OKAY, YOU SAID ASK YOU ANYTHING.

2489

01:54:22,060 --> 01:54:23,949

SO SPACE STATION QUESTIONS ARE  
STILL OKAY?

2490

01:54:23,949 --> 01:54:24,949

>> SURE.

2491

01:54:24,949 --> 01:54:26,640

>> THIS QUESTION ACTUALLY COMES  
FROM MY SISTER'S KINDERGARTEN

2492

01:54:26,640 --> 01:54:28,070

CLASS AT JOHN YOUNG ELEMENTARY.

2493

01:54:28,070 --> 01:54:30,070

IT'S A TWO-PARTER.

2494

01:54:30,070 --> 01:54:33,250

THEY WANT TO KNOW WHAT HAPPENS  
IF THERE'S A METEOR OR SPACE

2495

01:54:33,250 --> 01:54:35,070

JUNK HEADED TOWARDS THE SPACE  
STATION?

2496

01:54:35,070 --> 01:54:39,000

AND IS THE FOOD REALLY YUCKY?

2497

01:54:39,000 --> 01:54:40,940

>> YOU'RE IN LUCK BECAUSE I KNOW  
THE ANSWER TO BOTH OF THOSE.

2498

01:54:40,940 --> 01:54:43,860

SO A LOT OF TIMES WE HAVE TO DO  
WHAT'S CALLED A DEBRIS AVOIDANCE

2499

01:54:43,860 --> 01:54:45,390

MANEUVER, RIGHT?

2500

01:54:45,390 --> 01:54:47,960

SO WE TRACK -- THERE'S A LOT OF  
STUFF OUT THERE IN SPACE

2501

01:54:47,960 --> 01:54:49,250

FLOATING AROUND THAT WE TRACK.

2502

01:54:49,250 --> 01:54:51,860

AND A LOT OF IT'S JUNK FROM  
OTHER SATELLITES THAT HAVE

2503

01:54:51,860 --> 01:54:54,310

EITHER GONE OUT OF COMMISSION OR  
WHATEVER IT MAY BE, A PIECE OF

2504

01:54:54,310 --> 01:54:56,199

DEBRIS THAT'S UP THERE.

2505

01:54:56,199 --> 01:54:58,780

WHEN SOMETHING IS GOING 17,000  
MILES AN HOUR, YOU DON'T WANT

2506

01:54:58,780 --> 01:55:00,150

THAT HITTING THE STATION.

2507

01:55:00,150 --> 01:55:03,949

A LOT OF TIMES THEY TRACK IT,  
ASSIGN THIS COLOR CODE TO IT

2508

01:55:03,949 --> 01:55:06,699

BASED ON THE PROBABILITY THAT  
IT'S GOING TO HIT IS.

2509

01:55:06,699 --> 01:55:09,273

SO THEY CAN MOVE THE ORBIT OF  
THE STATION, GET OUT OF THE WAY

2510

01:55:09,273 --> 01:55:11,070

OF IT IF THEY WANT TO.

2511

01:55:11,070 --> 01:55:12,929

IF THEY DON'T HAVE ENOUGH TIME  
TO DO THAT BECAUSE THAT REQUIRES

2512

01:55:12,929 --> 01:55:16,060

A LOT OF PLANNING, THEN THEY'LL  
PUT THE CREW INSIDE THE SOYUZ IN

2513

01:55:16,060 --> 01:55:18,210

CASE THEY HAVE TO EVACUATE.

2514

01:55:18,210 --> 01:55:22,020

LUCKILY WE'VE NEVER HAD TO DO  
THAT.

2515

01:55:22,020 --> 01:55:23,020

THAT'S EASILY DONE.

2516

01:55:23,020 --> 01:55:25,989

IN TERMS OF THE FOOD, WE HAVE  
THE FOOD LAB ACTUALLY AT THE

2517

01:55:25,989 --> 01:55:28,210

JOHNSON SPACE CENTER WHERE THEY  
CREATE THE FOOD AND THEY MAKE IT

2518

01:55:28,210 --> 01:55:29,960

AND THINGS LIKE THAT FOR BOTH  
SHUTTLE AND STATION.

2519

01:55:29,960 --> 01:55:31,490

SO I'VE BEEN ABLE TO TASTE SOME  
OF THAT.

2520

01:55:31,490 --> 01:55:33,610

THE SHRIMP COOK TRAIL IS  
FANTASTIC.

2521

01:55:33,610 --> 01:55:36,600

THE TOFU WITH HOISIN SAUCE IS  
NASTY.

2522

01:55:36,600 --> 01:55:38,150

THAT'S JUST ME.

2523

01:55:38,150 --> 01:55:39,860

BUT YEAH, THEY'VE GOT REALLY  
GOOD FOOD UP THERE.

2524

01:55:39,860 --> 01:55:43,550

THEY HAVE A BROCCOLI RICE  
CASSEROLE AND OTHER THINGS, IT'S

2525

01:55:43,550 --> 01:55:44,550

GOOD.

2526

01:55:44,550 --> 01:55:50,250

I MEAN, IT'S BETTER THAN  
CAFETERIA FOOD I HAD IN SCHOOL.

2527

01:55:50,250 --> 01:55:52,400

>> I WANTED TO ASK A QUESTION ON  
BEHALF OF A JOURNALIST FRIEND OF

2528

01:55:52,400 --> 01:55:53,400

MINE.

2529

01:55:53,400 --> 01:55:57,760

WHAT DO YOU THINK THE NEWS CYCLE  
IS ON THE ISS?

2530

01:55:57,760 --> 01:55:58,760

>> THE NEWS CYCLE?

2531

01:55:58,760 --> 01:55:59,760

>> YEAH.

2532

01:55:59,760 --> 01:56:00,760

>> LIKE IN TERMS OF TIME?

2533

01:56:00,760 --> 01:56:01,760

>> YEAH.

2534

01:56:01,760 --> 01:56:03,239

>> YOU KNOW, IT DEPENDS.

2535

01:56:03,239 --> 01:56:05,350

IF IT'S SOMETHING THAT'S  
HAPPENING KIND OF THAT DAY AND

2536

01:56:05,350 --> 01:56:08,100

IS LIKE A SOYUZ DOCKING OR  
SOMETHING LIKE THAT, IT'S PRETTY

2537

01:56:08,100 --> 01:56:09,100  
IMMEDIATE.

2538  
01:56:09,100 --> 01:56:13,370  
THE MEDIA STILL COVER IT AND WE  
GET A LOT OF ATTENTION.

2539  
01:56:13,370 --> 01:56:15,961  
THE QUESTION I ALWAYS GET IS  
WHAT ARE YOU GUYS DOING NOW THAT

2540  
01:56:15,961 --> 01:56:16,961  
THE SHUTTLE HAS RETIRED?

2541  
01:56:16,961 --> 01:56:19,570  
I CAN HONESTLY TELL YOU WITH A  
STRAIGHT FACE, WE ARE BUSIER NOW

2542  
01:56:19,570 --> 01:56:21,610  
THAN EVER.

2543  
01:56:21,610 --> 01:56:22,610  
IT'S A DIFFERENT TIME.

2544  
01:56:22,610 --> 01:56:24,750  
NOW THAT THE SHUTTLE HAS  
RETIRED.

2545  
01:56:24,750 --> 01:56:27,070  
THE MEDIA INTEREST IS STILL  
THERE.

2546  
01:56:27,070 --> 01:56:29,000  
THERE'S STILL A LOT TO COVER AND  
THERE'S STILL A LOT OF STORIES

2547  
01:56:29,000 --> 01:56:31,010  
TO TELL ABOUT WHAT WE'RE DOING  
ON BOARD THE STATION.

2548

01:56:31,010 --> 01:56:33,060

AND THEY'RE GOOD STORIES.

2549

01:56:33,060 --> 01:56:35,530

>> SOMETHING LIKE TODAY ON THE  
ISS?

2550

01:56:35,530 --> 01:56:39,060

>> SO WE HAVE THE ISS UPDATES  
SHOW EVERY DAY AT 10:00/11

2551

01:56:39,060 --> 01:56:40,060

EASTERN.

2552

01:56:40,060 --> 01:56:42,070

THERE'S A HANDFUL OF US THAT DO  
THAT EVERY DAY.

2553

01:56:42,070 --> 01:56:44,350

WE'VE CHANGED THE FORMAT OF THAT  
A LITTLE.

2554

01:56:44,350 --> 01:56:46,650

INSTEAD OF RUNNING COMMENTARY,  
WE'RE TRYING TO BRING IN MORE

2555

01:56:46,650 --> 01:56:50,170

GUESTS, SIT PEOPLE DOWN THAT  
WORK BEHIND THE SCENES.

2556

01:56:50,170 --> 01:56:53,239

ONE OF THE GREATEST STORIES  
ABOUT THE STATION IS THE PEOPLE

2557

01:56:53,239 --> 01:56:55,600

THAT WORK BEHIND THE SCENES ON  
THE GROUND THAT MAKE ALL THAT

2558

01:56:55,600 --> 01:56:57,240

POSSIBLE AND MAKE IT WORK.

2559

01:56:57,240 --> 01:56:59,199

AND THERE'S SOME PEOPLE THAT  
HAVE SOME REALLY COOL JOBS.

2560

01:56:59,199 --> 01:57:01,190

PEOPLE TELL ME HOW DID I GET MY  
JOB?

2561

01:57:01,190 --> 01:57:04,239

I WANT TO KNOW HOW SOME OF THESE  
PEOPLE -- HOW DO YOU BECOME THE

2562

01:57:04,239 --> 01:57:07,530

PERSON THAT STEERS THE SPACE  
STATION AND MAKES IT TURN?

2563

01:57:07,530 --> 01:57:09,300

THERE'S A PERSON AT MISSION  
CONTROL THAT DOES THAT.

2564

01:57:09,300 --> 01:57:11,840

SO WE'RE TRYING TO TELL MORE OF  
THAT.

2565

01:57:11,840 --> 01:57:13,780

WE'RE TRYING TO TELL MORE OF THE  
RESEARCH STORIES AND THINGS LIKE

2566

01:57:13,780 --> 01:57:16,650

THAT AND GET THE PUBLIC ENGAGED  
AND LET THEM KNOW WHAT WE'RE

2567

01:57:16,650 --> 01:57:17,650

DOING.

2568

01:57:17,650 --> 01:57:19,460

THAT'S A GOOD QUESTION.

2569  
01:57:19,460 --> 01:57:20,590  
WHO ELSE?

2570  
01:57:20,590 --> 01:57:23,900  
>> THE -- SORRY.

2571  
01:57:23,900 --> 01:57:27,140  
COULD YOU PLEASE COMPARE AND  
CONTRAST THE DIFFERENCES

2572  
01:57:27,140 --> 01:57:30,240  
BETWEEN -- THE DIFFERENCES AND  
SIMILARITIES BETWEEN THE U.S.

2573  
01:57:30,240 --> 01:57:33,110  
LAUNCHES YOU'VE EXPERIENCED AND  
THE RUSSIAN LAUNCHES YOU'VE

2574  
01:57:33,110 --> 01:57:34,110  
EXPERIENCED?

2575  
01:57:34,110 --> 01:57:35,110  
>> OKAY.

2576  
01:57:35,110 --> 01:57:37,940  
SO JOHN TOLD YOU THAT I GO OVER  
TO RUSSIA AND KAZAKHSTAN WITH

2577  
01:57:37,940 --> 01:57:41,300  
ROB NAVIS, MY COUNTERPART IN  
HOUSTON.

2578  
01:57:41,300 --> 01:57:43,600  
HE DOES LAUNCH, I DO LANDING AND  
THE OTHER WAY.

2579  
01:57:43,600 --> 01:57:44,600  
IT'S DIFFERENT.

2580

01:57:44,600 --> 01:57:48,429

THE FIRST TIME THEY TOOK ME OUT  
THERE, THE RUSSIANS HAVE A

2581

01:57:48,429 --> 01:57:51,300

LONGSTANDING WAY THEY DO THINGS.

2582

01:57:51,300 --> 01:57:52,489

IT'S RADICALLY DIFFERENT.

2583

01:57:52,489 --> 01:57:54,239

IT'S A DIFFERENT CULTURE.

2584

01:57:54,239 --> 01:57:57,390

YOU LEARN TO APPRECIATE THAT  
WHENEVER YOU'RE OVER THERE.

2585

01:57:57,390 --> 01:57:58,560

THE ROCKET IS IMPRESSIVE.

2586

01:57:58,560 --> 01:58:00,600

WHENEVER YOU SEE IT, THERE'S A  
HECK OF A LOT OF ENGINES ON THE

2587

01:58:00,600 --> 01:58:02,640

BOTTOM OF IT.

2588

01:58:02,640 --> 01:58:07,219

NOW, WHAT'S FUNNY, I WAS SO USED  
TO GOING TO SHUTTLE LAUNCHES

2589

01:58:07,219 --> 01:58:10,290

BACK THREE OR FOUR MILES FROM  
THE LAUNCH COMPLEX.

2590

01:58:10,290 --> 01:58:13,909

OUT AT THE LAUNCH SITE, YOU'RE  
ABOUT A KILOMETER AWAY.

2591

01:58:13,909 --> 01:58:16,170

AND THEY TOOK US OUT THERE AND  
STOOD US THERE, AND I TURNED

2592

01:58:16,170 --> 01:58:19,810

AROUND TO ROB AND I WAS, LIKE,  
WE ARE REALLY CLOSE.

2593

01:58:19,810 --> 01:58:21,850

BUT IT'S IMPRESSIVE.

2594

01:58:21,850 --> 01:58:23,040

IT'S IMPRESSIVE HOW THEY DO IT.

2595

01:58:23,040 --> 01:58:26,500

NOW, LANDINGS WHICH I'VE  
PROBABLY DONE MORE OF, IT'S JUST

2596

01:58:26,500 --> 01:58:27,500

FUN.

2597

01:58:27,500 --> 01:58:29,260

YOU GET TO BE PART OF A VERY  
SMALL TEAM OUT THERE.

2598

01:58:29,260 --> 01:58:31,170

WE DID A VIDEO IF YOU GUYS HAVE  
EVER SEEN IT, A

2599

01:58:31,170 --> 01:58:35,210

BEHIND-THE-SCENES VIDEO WHERE WE  
TOOK THE CAMERA TO SHOW WHAT

2600

01:58:35,210 --> 01:58:36,210

IT'S LIKE.

2601

01:58:36,210 --> 01:58:38,260

IT'S A SMALL GROUP OF PEOPLE  
THAT GO OUT THERE.

2602

01:58:38,260 --> 01:58:41,780

THE RUSSIAN SEARCH AND RESCUE  
PEOPLE ARE FANTASTIC.

2603

01:58:41,780 --> 01:58:42,780

THEY WELCOME YOU.

2604

01:58:42,780 --> 01:58:44,489

THEY'RE VERY WARM PEOPLE.

2605

01:58:44,489 --> 01:58:46,680

AND THEY'VE GOT THAT PROCESS  
DOWN VERY QUICKLY.

2606

01:58:46,680 --> 01:58:49,150

I MEAN, THAT CAPSULE GETS DOWN  
ON THE GROUND, AND WE SEE IT

2607

01:58:49,150 --> 01:58:50,420

HIT.

2608

01:58:50,420 --> 01:58:52,790

AND WE'RE ON THE GROUND WITHIN A  
MATTER OF JUST A COUPLE MINUTES,

2609

01:58:52,790 --> 01:58:55,400

AND THEY'VE GOT THE CREW OUT  
WITHIN THE BLINK OF AN EYE, YOU

2610

01:58:55,400 --> 01:58:56,909

KNOW.

2611

01:58:56,909 --> 01:58:58,840

LAST TIME I WENT WAS MIKE  
FOSSUM'S LANDING, AND IT WAS

2612

01:58:58,840 --> 01:59:01,209

ABOUT NEGATIVE 15 DEGREES.

2613

01:59:01,209 --> 01:59:04,100

THAT PART YOU NEVER GET USED TO.

2614

01:59:04,100 --> 01:59:05,670

BUT IT'S INTERESTING.

2615

01:59:05,670 --> 01:59:09,500

THE SOYUZ IS A VERY SMALL  
VEHICLE, BUT IT'S A WORKHORSE.

2616

01:59:09,500 --> 01:59:10,500

IT'S A WORKHORSE.

2617

01:59:10,500 --> 01:59:11,500

WHAT ELSE?

2618

01:59:11,500 --> 01:59:17,960

>> IS

THERE ALCOHOL ON THE SPACE

2619

01:59:17,960 --> 01:59:18,960

STATION?

2620

01:59:18,960 --> 01:59:22,020

AND CAN YOU GET DRUNK?

2621

01:59:22,020 --> 01:59:23,710

>> YEAH, THAT HAS BEEN IN THE  
NEWS LATELY.

2622

01:59:23,710 --> 01:59:26,710

ONE OF THESE -- ONE OF THESE  
EXPERIMENTS GOING UP, THAT IS

2623

01:59:26,710 --> 01:59:27,710

NOT US.

2624

01:59:27,710 --> 01:59:28,710  
THAT'S NOT NASA.

2625  
01:59:28,710 --> 01:59:30,429  
WE DON'T HAVE ANYTHING TO DO  
WITH THAT AT ALL.

2626  
01:59:30,429 --> 01:59:32,199  
YEAH, I CAN ONLY SPEAK ON BEHALF  
OF THE AGENCY.

2627  
01:59:32,199 --> 01:59:33,720  
THE ANSWER TO THAT'S NO.

2628  
01:59:33,720 --> 01:59:38,179  
THERE ARE SOME OTHERS THAT ARE  
NOT WITH US THAT ARE TAKING A

2629  
01:59:38,179 --> 01:59:39,610  
LOOK AT THAT.

2630  
01:59:39,610 --> 01:59:42,100  
>> WHAT DO THEY DO FOR FUN UP  
THERE?

2631  
01:59:42,100 --> 01:59:43,100  
>> WHAT DO THEY DO FOR FUN?

2632  
01:59:43,100 --> 01:59:44,100  
YOU KNOW, THEY SIT THERE.

2633  
01:59:44,100 --> 01:59:46,023  
YOU GUYS KNOW WHAT THE CUPOLA  
IS, RIGHT?

2634  
01:59:46,023 --> 01:59:48,580  
THE BIG WINDOWS.

2635  
01:59:48,580 --> 01:59:49,659

THEY LOOK AT THEIR HOMETOWN.

2636

01:59:49,659 --> 01:59:51,870

I DON'T THINK THAT WOULD EVER  
GET OLD.

2637

01:59:51,870 --> 01:59:55,410

THEY'VE GOT PHONES ON BOARD,  
THEY CAN TALK TO THEIR FAMILY,

2638

01:59:55,410 --> 01:59:56,410

E-MAIL EACH OTHER.

2639

01:59:56,410 --> 01:59:58,280

THEY'RE IN MUCH BETTER CONTACT  
WITH THEIR FRIENDS AND FAMILY

2640

01:59:58,280 --> 02:00:00,140

NOW THAN THEY'VE EVER BEEN  
BEFORE.

2641

02:00:00,140 --> 02:00:01,140

SO IT FEELS LIKE THEY'RE THERE.

2642

02:00:01,140 --> 02:00:04,489

BUT I DON'T THINK THAT VIEW  
WOULD EVER GET OLD.

2643

02:00:04,489 --> 02:00:06,489

THAT'S WHAT I'VE ALWAYS ASKED  
WHEN THEY COME BACK.

2644

02:00:06,489 --> 02:00:07,880

WHAT WAS IT LIKE TO LOOK DOWN?

2645

02:00:07,880 --> 02:00:10,590

AND THE PICTURES, AS GOOD AS OUR  
CAMERAS ARE, THEY SAY JUST DON'T

2646

02:00:10,590 --> 02:00:13,219  
DO IT JUSTICE AT ALL.

2647  
02:00:13,219 --> 02:00:15,130  
SOMETIMES HUMANS ARE THE ONLY  
ONES THAT CAN ACTUALLY

2648  
02:00:15,130 --> 02:00:16,130  
APPRECIATE SOMETHING.

2649  
02:00:16,130 --> 02:00:19,790  
A CAMERA CAN'T QUITE CAPTURE IT.

2650  
02:00:19,790 --> 02:00:20,790  
>> THANK YOU.

2651  
02:00:20,790 --> 02:00:22,010  
WE HAVE TIME FOR ONE MORE  
QUESTION, I THINK.

2652  
02:00:22,010 --> 02:00:23,099  
>> ONE MORE?

2653  
02:00:23,099 --> 02:00:26,360  
>> OKAY, WE'LL TAKE IT OVER  
HERE.

2654  
02:00:26,360 --> 02:00:28,469  
>> SINCE YOU'VE WATCHED THE  
LANDINGS, AND WE'VE SEEN THEM ON

2655  
02:00:28,469 --> 02:00:32,110  
TV AS WELL, AND WE'VE HEARD  
ASTRONAUTS TALK ABOUT THE RETURN

2656  
02:00:32,110 --> 02:00:36,170  
IN THE SOYUZ, WHAT'S YOUR  
PERSPECTIVE OR PERCEPTION OF

2657

02:00:36,170 --> 02:00:38,239  
THAT LANDING WHEN IT OCCURS?

2658  
02:00:38,239 --> 02:00:41,200  
>> IT'S NOT FOR THE FAINT OF  
HEART, I CAN TELL YOU THAT.

2659  
02:00:41,200 --> 02:00:43,890  
YOU KNOW, TALKING TO MIKE CINK  
AND SOME OF THE OTHER ASTRONAUTS

2660  
02:00:43,890 --> 02:00:46,710  
THAT HAVE FLOWN THAT, YOU ASK  
THEM ABOUT THE LANDING.

2661  
02:00:46,710 --> 02:00:49,989  
IF YOU KNOW ANYTHING ABOUT IT,  
IT COMES DOWN PRETTY QUICK.

2662  
02:00:49,989 --> 02:00:53,590  
THEY'VE GOT THESE SOFT LANDING  
THRUSTERS THAT FIRE, IT KIND OF

2663  
02:00:53,590 --> 02:00:57,620  
PADS IT A LITTLE BIT, BUT IT  
STILL LANDS AT 20 TO 30 MILES AN

2664  
02:00:57,620 --> 02:00:58,620  
HOUR.

2665  
02:00:58,620 --> 02:00:59,620  
IT'S A BUMP.

2666  
02:00:59,620 --> 02:01:03,239  
THEY SAY THE MOST JARRING THING  
IS WHEN THE CHUTES COME OUT.

2667  
02:01:03,239 --> 02:01:04,300  
THEY'RE NOT USED TO GRAVITY.

2668

02:01:04,300 --> 02:01:05,540

THEY'VE BEEN UP THERE SIX  
MONTHS.

2669

02:01:05,540 --> 02:01:10,080

WHEN THE CHUTE COMES OUT, IT  
GIVES YOU A PRETTY GOOD PULL.

2670

02:01:10,080 --> 02:01:13,710

SOMETIMES DEPENDING ON THE WIND,  
THEY START SPINNING.

2671

02:01:13,710 --> 02:01:17,140

I COULDN'T DO MERRY-GO-ROUNDS  
EVEN AS A 4-YEAR-OLD SO I DON'T

2672

02:01:17,140 --> 02:01:20,250

THINK I'D LAST LONG ON THE  
SOYUZ.

2673

02:01:20,250 --> 02:01:24,739

IT'S A RIDE, BUT, YOU KNOW, THEY  
COME BACK IN STYLE, I'LL PUT IT

2674

02:01:24,739 --> 02:01:25,739

THAT WAY.

2675

02:01:25,739 --> 02:01:27,480

IT'S AN INTERESTING THING  
WHENEVER YOU GO THERE AND YOU

2676

02:01:27,480 --> 02:01:28,480

SEE IT IN PERSON.

2677

02:01:28,480 --> 02:01:30,340

YOU LEARN HOW THEY DO IT.

2678

02:01:30,340 --> 02:01:31,900

IT'S A COOL VEHICLE.

2679

02:01:31,900 --> 02:01:36,210

WELL, THANK YOU GUYS VERY MUCH.

2680

02:01:36,210 --> 02:01:40,570

ENJOY YOUR TIM.

2681

02:01:40,570 --> 02:01:42,030

TIME.

2682

02:01:44,940 --> 02:01:43,480

>> OKAY.

2683

02:01:44,940 --> 02:01:45,940

SO IT'S 11:30.

2684

02:01:45,940 --> 02:01:47,370

OUR LUNCH IS HERE.

2685

02:01:47,370 --> 02:01:50,051

EVEN THOUGH THE TV PROGRAM IS  
GOING TO BE CONCLUDING, I WANT

2686

02:01:50,051 --> 02:01:53,000

TO REMIND FOLKS WATCHING THAT  
THE NASA SOCIAL WILL CONTINUE.

2687

02:01:53,000 --> 02:02:00,670

YOU CAN FOLLOW ON HASH TAG  
@NASASOCIAL AND GOOGLE PLUS,

2688

02:02:00,670 --> 02:02:01,920

ACCOUNT NASA.

2689

02:02:01,920 --> 02:02:05,910

THANKS EVERYBODY FOR JOINING US,  
AND WE WILL STILL BE ON.

2690

02:02:05,910 --> 02:02:06,910  
SO TUNE IN.

2691  
02:02:06,910 --> 02:02:11,370  
THANKS.

2692  
02:02:11,370 --> 02:02:23,430  
OH, YEAH, I COULD HAVE CHECKED  
THERE.

2693  
02:02:23,430 --> 02:02:24,430  
OKAY.