
# Episode 12:
## From Apollo to Artemis

July 2019

@NASAKennedy
#NASARocketRanch

New episodes every month!

1
00:00:01,900 --> 00:00:03,420
[ Bird cries ]

2
00:00:03,500 --> 00:00:11,800
Fifty years ago, NASA was on the precipice
of mankind's most historic small steps.

3
00:00:11,800 --> 00:00:16,020
EGS Program Chief Engineer verify no constraints
to launch.

4
00:00:16,020 --> 00:00:18,900
3, 2, 1, and lift-off!

5
00:00:18,900 --> 00:00:20,660
Welcome to Space.

6
00:00:22,900 --> 00:00:29,419
Today we take you inside the Control Room
and onto the ocean during the Apollo 11 mission.

7
00:00:29,419 --> 00:00:33,680
We're taking a look back at the work done
here on Earth to ensure our heroic astronauts

8
00:00:33,680 --> 00:00:36,399
succeeded on mankind's most daring adventure.

9
00:00:36,399 --> 00:00:42,250
In a few minutes, we'll hear from Milt Heflin
and Melissa Jones on oceanic-recovery activities.

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00:00:42,250 --> 00:00:45,989
But first up, we have Bob Sieck.

11
00:00:45,989 --> 00:00:50,030
He was one of the engineers on console in
the Launch Control Center for Apollo 11 and

12
00:00:50,030 --> 00:00:56,440
went on to serve as the Space Shuttle Launch
Director in the '80s and '90s.

13
00:00:56,440 --> 00:00:58,460
I am now in the booth with Bob Sieck.

14
00:00:58,460 --> 00:01:00,359
Bob, thanks for joining me.

15
00:01:00,360 --> 00:01:08,310
Pleasure to be here and to continue the acknowledgement of the Apollo Program and the accomplishments.

16
00:01:08,310 --> 00:01:12,680
Yes, so, obviously, we brought you in for
a very special reason -- because you have

17
00:01:12,680 --> 00:01:15,610
a very long history with NASA and the Space
Program.

18
00:01:15,610 --> 00:01:20,370
So I wanted to let you just kind of give us
a really quick kind of flyby of your career,

19
00:01:20,370 --> 00:01:21,510
if you would.

20
00:01:21,510 --> 00:01:23,430
Well, okay.

21
00:01:23,430 --> 00:01:30,650
So, graduated from college with an Electrical
Engineering degree, 1960.

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00:01:30,650 --> 00:01:32,290
We had just invented transistors.

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00:01:32,290 --> 00:01:36,380
A chip was still something you carved off
of a block of wood.

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00:01:36,380 --> 00:01:37,500
[ Chuckles ]

25
00:01:37,500 --> 00:01:40,200
So three years' active duty in the military.

26
00:01:40,200 --> 00:01:48,430
In '63, came down here to Florida to make
it my home and be part of the great adventure.

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00:01:48,430 --> 00:01:55,270
After a year as a contractor, I got on with
NASA in 1964, Journeyman Engineer in Gemini

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00:01:55,270 --> 00:02:01,800
spacecraft, responsible for the biomedical
instrumentation that the astronauts had.

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00:02:01,800 --> 00:02:06,480
We didn't know much about the effects of space
on the body back then, so they were heavily

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00:02:06,480 --> 00:02:10,690
instrumented -- best way to put it, just like
the spacecraft and rocket -- lots of instruments

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00:02:10,690 --> 00:02:17,111
on the astronauts to see how the body reacted
to all the rigors of spaceflight -- did that

32
00:02:17,111 --> 00:02:18,111
through Gemini.

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00:02:18,111 --> 00:02:25,220
In Apollo, I was responsible -- I was Testing
-- Spacecraft Testing Integration Engineer,

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00:02:25,220 --> 00:02:29,480
which meant you are like a technical test
conductor for the tests on the Lunar Module

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00:02:29,480 --> 00:02:36,701
and the Command Service Module, and held that
responsibility all through Apollo, got in

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00:02:36,701 --> 00:02:42,460
on the ground floor of the Shuttle Program
with, essentially, the same responsibility,

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00:02:42,460 --> 00:02:49,670
and then a couple years in, got promoted to
Launch Director in '83, '84 -- had about a

38
00:02:49,670 --> 00:02:56,450
dozen missions then and was then elevated,
if that's the term, to the Director of Shuttle

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00:02:56,450 --> 00:02:58,890
Operations at the Cape.

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00:02:58,890 --> 00:03:05,290
Challenger happened -- a lot of realignment
and changing the organization, obviously,

41
00:03:05,290 --> 00:03:11,780
and after Challenger, I successfully lobbied
to go back to being Launch Director.

42
00:03:11,780 --> 00:03:18,060
I felt that was my strongest suit, so to speak,
to help with the return to flight effort and

43
00:03:18,060 --> 00:03:26,200
the continuation of the program and enjoyed
that for a number of years -- total of 50-some

44
00:03:26,200 --> 00:03:30,050
missions that I'm thankful there was a landing
for all of those.

45
00:03:30,050 --> 00:03:31,050
Yeah.

46
00:03:31,050 --> 00:03:36,960
And then was, again, promoted to the Director
of Shuttle Operations to handle the transition,

47
00:03:36,960 --> 00:03:41,880
more the responsibility to the contractor
and the new contractor at the time -- retired

48
00:03:41,880 --> 00:03:43,300
in '99.

49
00:03:43,300 --> 00:03:47,480
Still connected with the people in the business
through some NASA Advisory Panels.

50
00:03:47,480 --> 00:03:51,640
Yeah, and we always love hearing from you
and having you back.

51
00:03:51,640 --> 00:03:57,400
We could fill probably days with all of the
stories and kind of the wisdom that you have

52
00:03:57,400 --> 00:04:01,069
to share on space, but we wanted to kind of
dwell on the '60s.

53
00:04:01,069 --> 00:04:06,910
So, going back to '61, Alan Shepard is flying
on a suborbital flight into space.

54
00:04:06,910 --> 00:04:08,750

Do you remember this moment?

55
00:04:08,750 --> 00:04:17,630
Yes, I do, and the fact that we did it was
-- Regardless of what the Russians had already

56
00:04:17,630 --> 00:04:22,229
done, the fact that we did it first step,
literally.

57
00:04:22,229 --> 00:04:26,280
A lot of people think of the Lunar Landing,
first step on the Moon.

58
00:04:26,280 --> 00:04:31,969
I think of the first step as Alan Shepard
going up, and maybe, in hindsight, the first

59
00:04:31,969 --> 00:04:39,599
step was the Russians putting Sputnik up that
kind of ignited our resolve to do something

60
00:04:39,599 --> 00:04:48,430
about this in sort of a competitive way at
first, and, thankfully, the visionaries in

61
00:04:48,430 --> 00:04:57,569
Washington saw to that, and that ended with
the challenge of putting a man on the Moon

62
00:04:57,569 --> 00:05:00,419
and returning them safely -- never want to
forget that part --

63
00:05:00,419 --> 00:05:01,419
Yeah.

64
00:05:01,419 --> 00:05:02,419
[ Chuckles ]

65
00:05:02,419 --> 00:05:07,639
...by the Kennedy Administration and starting
that great adventure.

66
00:05:07,639 --> 00:05:09,039
And what's that like for you personally?

67
00:05:09,039 --> 00:05:13,960
'Cause at this point, I think you said you're
finishing up college, Sputnik's flying, we're

68
00:05:13,960 --> 00:05:16,699
getting Alan Shepard off the ground.

69
00:05:16,699 --> 00:05:23,360
Is NASA like this fierce kind of wonderful
thing that's unattainable, or is it like,

70
00:05:23,360 --> 00:05:25,249
"Let's be America, let's go do this"?

71
00:05:25,249 --> 00:05:28,319
I think it's the latter.

72
00:05:28,319 --> 00:05:37,930
NASA was obviously given the baton to do this,
the responsibility, and the sense was that

73
00:05:37,930 --> 00:05:45,379
there was commitment behind that task or that
resolve or our resolution -- whatever you

74
00:05:45,379 --> 00:05:49,759
want to call it -- in the political environment,
which was important.

75
00:05:49,759 --> 00:05:55,809
So I said, "Well, I want to be at the front
end of this adventure."

76
00:05:55,809 --> 00:05:57,059
Yeah.

77
00:05:57,059 --> 00:06:03,259
Obviously, contractors were hiring, also,
but it was obvious to me it's a government

78
00:06:03,259 --> 00:06:10,419
responsibility, so I'm gonna go with the government
team and see what I can do to be part of it.

79
00:06:10,419 --> 00:06:14,990
And so as we kind of fast-forward a few years,
how did you end up with NASA?

80
00:06:14,990 --> 00:06:19,270
Was this just like another job you were applying
for or was this, somehow, a special kind of

81
00:06:19,270 --> 00:06:20,270
opportunity?

82
00:06:20,270 --> 00:06:22,930
Oh, I looked at it as an opportunity for sure.

83
00:06:22,930 --> 00:06:34,819
I took it to heart that this was now a resolve
that our nation had put forward and decided

84
00:06:34,819 --> 00:06:36,550
to accept it.

85
00:06:36,550 --> 00:06:40,889
So I didn't look at it as just a job.

86
00:06:40,889 --> 00:06:43,110
It was kind of like, I'm on a mission.

87
00:06:43,110 --> 00:06:47,960
Our government's on a mission, our country's
on a mission, so I'm gonna be part of the

88
00:06:47,960 --> 00:06:57,879
team that accepts the challenge and the responsibility
of doing the things that need to be done,

89
00:06:57,879 --> 00:07:00,690
as Kennedy said, "not because they're easy,
but because they're hard."

90
00:07:00,690 --> 00:07:01,690
Yeah.

91
00:07:01,690 --> 00:07:06,270
Do you think that everyone kind of came in
with that team mentality?

92
00:07:06,270 --> 00:07:10,629
Is it something where you feel part of something
bigger than yourself?

93
00:07:10,629 --> 00:07:15,639
I would say yes.

94
00:07:15,639 --> 00:07:19,939
Most of us that worked in the early years
of the Space Program had spent time in the

95
00:07:19,939 --> 00:07:21,050
military.

96
00:07:21,050 --> 00:07:22,169
Okay.

97
00:07:22,169 --> 00:07:23,170
Mandatory draft back then, so –

98
00:07:23,170 --> 00:07:27,039
– So not even just the astronauts, but the
engineers on the floor?

99
00:07:27,039 --> 00:07:28,039
Right.

100
00:07:28,039 --> 00:07:29,039
Oh, yeah.

101
00:07:29,039 --> 00:07:30,039
Yeah.

102
00:07:30,039 --> 00:07:35,779
I would sit at the console next to people
that sat in foxholes in Korea or flew B-17s

103
00:07:35,779 --> 00:07:43,930
in World War II, and this is a -- We felt
-- and I think we were looked at -- as we're

104
00:07:43,930 --> 00:07:48,090
a national resource on a government mission
here.

105
00:07:48,090 --> 00:07:51,110
We're not wearing uniforms anymore like most
of us did.

106
00:07:51,110 --> 00:07:52,110
Yeah.

107
00:07:52,110 --> 00:07:53,110
Wow.

108
00:07:53,110 --> 00:07:58,699
But we understand responsibility and accountability,
and we've been charged that this is our mission,

109
00:07:58,699 --> 00:08:05,419
and so we took it seriously and, of course,
proceeded accordingly.

110
00:08:05,419 --> 00:08:08,840
But we knew there was a lot of attention to
what we were doing.

111
00:08:08,840 --> 00:08:16,139
It would be a very visible thing, but most
of us didn't look at that being the big deal,

112
00:08:16,139 --> 00:08:17,689
so to speak.

113
00:08:17,689 --> 00:08:23,539
What was the big deal was -- we're responsible
for accomplishing this as an individual and

114
00:08:23,539 --> 00:08:28,659
as a member of a team, and we're gonna get
it done.

115
00:08:28,659 --> 00:08:32,669
Do you feel like there's an emotional element
to it?

116
00:08:32,669 --> 00:08:37,909
And kind of the thought behind that question
is, thinking about if -- I think my tendency

117
00:08:37,909 --> 00:08:43,500
is to think of the military as being very,
like, objective and focused, and we execute.

118
00:08:43,500 --> 00:08:44,959
That's what we do.

119
00:08:44,959 --> 00:08:47,800

Do you feel like that's really similar to
how NASA was operating or was there a more

120
00:08:47,800 --> 00:08:52,850
emotional component to it that kind of was
like this feeling and that commitment and

121
00:08:52,850 --> 00:08:54,399
way beyond just tasks?

122
00:08:54,399 --> 00:08:57,570
Well, I think it was a combination of both.

123
00:08:57,570 --> 00:09:05,440
Obviously the discipline responsibility, accountability
thing factored into it, but, also, I remembered

124
00:09:05,440 --> 00:09:11,850
getting the briefings from the NASA managers
when a journeyman first came on board was,

125
00:09:11,850 --> 00:09:17,920
"Okay, now you're responsible for this task
and maybe this set of hardware has these boundary

126
00:09:17,920 --> 00:09:22,170
conditions and whatever, and this is your
system, and you're gonna interact with that

127
00:09:22,170 --> 00:09:23,269
system" -- technical stuff.

128
00:09:23,269 --> 00:09:24,269
Sure.

129
00:09:24,269 --> 00:09:30,990
But the other part of it was -- the message
that came loud and clear was, now, in addition

130

00:09:30,990 --> 00:09:37,220
to that responsibility, this is all about
the crew and the mission -- number-one priority

131
00:09:37,220 --> 00:09:38,399
is the crew and the mission.

132
00:09:38,399 --> 00:09:41,459
We talk about getting off the ground with
the rocket.

133
00:09:41,459 --> 00:09:48,470
Yeah, you can cheer that, but it's all about
getting these astronauts through their missions,

134
00:09:48,470 --> 00:09:54,890
successfully accomplish landing them, and
continuing on with the program.

135
00:09:54,890 --> 00:09:59,000
So the emphasis was always on you're responsible
for their safety.

136
00:09:59,000 --> 00:10:04,220
This is your system, but if you get in a fuzzy
area about responsibility, never forget the

137
00:10:04,220 --> 00:10:08,010
number-one priority is the crew and their
mission.

138
00:10:08,010 --> 00:10:13,329
How does that impact you and the people around
you when we lose the crew Apollo 1, then?

139
00:10:13,329 --> 00:10:15,399
'Cause, obviously, like, that's got to be
hard.

140
00:10:15,399 --> 00:10:16,399

It is hard.

141
00:10:16,399 --> 00:10:17,410
It is tough.

142
00:10:17,410 --> 00:10:29,529
The initial feeling is, we failed, and the
challenge of that is getting over the -- First,

143
00:10:29,529 --> 00:10:33,089
there's the shock and the grief and the guilt.

144
00:10:33,089 --> 00:10:34,819
You know, what went wrong?

145
00:10:34,819 --> 00:10:35,819
What did we do wrong?

146
00:10:35,819 --> 00:10:40,100
What did I do wrong as a member of the team,
if anything?

147
00:10:40,100 --> 00:10:47,610
And then you get into that aspect of, okay,
technically what happened here?

148
00:10:47,610 --> 00:10:48,620
What did we do?

149
00:10:48,620 --> 00:10:54,569
And then that gets broader into, well, are
there cultural issues here?

150
00:10:54,569 --> 00:10:55,569
What went wrong there?

151
00:10:55,569 --> 00:10:58,319
Then you get on with fixing everything.

152
00:10:58,319 --> 00:11:02,819
And you can take this to a level lower.

153
00:11:02,819 --> 00:11:05,649
When you made mistakes as a journeyman engineer
-- and we did.

154
00:11:05,649 --> 00:11:06,649
You're human.

155
00:11:06,649 --> 00:11:07,649
Yeah, that makes sense.

156
00:11:07,649 --> 00:11:11,639
We're doing stuff for the first time, and
we're developing the hardware for the first

157
00:11:11,639 --> 00:11:17,589
time, the procedures to test it, and the approach
of management was, well, okay, Bobby -- in

158
00:11:17,589 --> 00:11:20,230
this case -- assume, okay, you made a mistake.

159
00:11:20,230 --> 00:11:22,029
Scoot up and tell it like it is.

160
00:11:22,029 --> 00:11:26,589
Now, you won't make that mistake anymore as
a journeyman engineer, but the fellow coming

161
00:11:26,589 --> 00:11:32,480
in tomorrow or one that's on second shift,
or whatever, coming in, they're gonna potentially

162
00:11:32,480 --> 00:11:38,290
do the same thing, 'cause you're a responsible
person, and this was not an irresponsible

163
00:11:38,290 --> 00:11:39,900
act on your part.

164
00:11:39,900 --> 00:11:45,949
So what did we -- management speaking from
their viewpoint, what did we do to not set

165
00:11:45,949 --> 00:11:49,040
you up to succeed, if that makes a difference?

166
00:11:49,040 --> 00:11:51,199
Is it the training we gave you?

167
00:11:51,199 --> 00:11:52,790
Is it the tools?

168
00:11:52,790 --> 00:11:54,449
Is it the procedures?

169
00:11:54,449 --> 00:12:00,449
Because that's management's responsibility
to set you people doing this work up to be

170
00:12:00,449 --> 00:12:06,570
successful and to develop a high-quality product
-- whatever it is.

171
00:12:06,570 --> 00:12:08,160
So let's talk about that.

172
00:12:08,160 --> 00:12:11,860
Understand the root cause and get on with
what we're chartered to do.

173
00:12:11,860 --> 00:12:14,029
It was a great environment to work in, really.

174
00:12:14,029 --> 00:12:21,639

Was there ever a sense that you felt like
it was too much -- like the pace was too much,

175
00:12:21,639 --> 00:12:25,149
the risk was too much, like it just wasn't
gonna happen?

176
00:12:25,149 --> 00:12:29,410
The short answer is no.

177
00:12:29,410 --> 00:12:37,180
We were confident that we were gonna make
progress, and we saw that after each mission

178
00:12:37,180 --> 00:12:38,569
when things went well.

179
00:12:38,569 --> 00:12:44,360
There were always things in the early missions
that didn't go well, but there was enough

180
00:12:44,360 --> 00:12:47,820
progress that, no, we're continuing on.

181
00:12:47,820 --> 00:12:53,879
We're gonna get this done, and the work was
-- It was an incredible lot of fun.

182
00:12:53,879 --> 00:12:54,879
[ Laughs ]

183
00:12:54,879 --> 00:13:01,430
In fact, you'll hear from a number of the
workers it never felt like they really worked

184
00:13:01,430 --> 00:13:03,490
at the Space Center.

185
00:13:03,490 --> 00:13:05,360

It was, "Oh, boy.

186
00:13:05,360 --> 00:13:08,980
I got second shift tomorrow, and we're running
this test and whatever.

187
00:13:08,980 --> 00:13:14,879
So I'm gonna work overtime today to brush
up on the procedures so I know that when I

188
00:13:14,879 --> 00:13:20,640
come in here tomorrow, put on my headset,
and hook things up, that I'm ready to hit

189
00:13:20,640 --> 00:13:26,070
the ground running," and, of course, that
drug into long days, long nights, long weeks,

190
00:13:26,070 --> 00:13:30,980
and long months, and I always characterized
the whole effort of getting to the Moon, in

191
00:13:30,980 --> 00:13:33,760
my case, as a seven-year marathon.

192
00:13:33,760 --> 00:13:34,760
Yeah.

193
00:13:34,760 --> 00:13:36,199
Man, that's a good way to put it.

194
00:13:36,199 --> 00:13:42,079
So, Apollo 8, are you in the Control Room
for flying the first humans on Saturn V?

195
00:13:42,079 --> 00:13:43,480
Yes, yes.

196
00:13:43,480 --> 00:13:53,089

That was my first manned Apollo mission, and
I was somewhat surprised that it was only

197
00:13:53,089 --> 00:13:59,459
three months after Apollo 7 when we flew the
astronauts for the first time in an Apollo

198
00:13:59,459 --> 00:14:06,149
capsule on a smaller Saturn rocket and a previous
Saturn V launch with an unmanned rocket, which

199
00:14:06,149 --> 00:14:10,720
had been sometime months before that was not
all that successful.

200
00:14:10,720 --> 00:14:11,720
Okay.

201
00:14:11,720 --> 00:14:20,550
But then there was enough confidence in where
we were in our development and acceptance

202
00:14:20,550 --> 00:14:27,829
of this new system and confidence in it that
we can go ahead and commit to put three astronauts

203
00:14:27,829 --> 00:14:33,120
on top of it and go around the Moon after
what had happened only just a few years before

204
00:14:33,120 --> 00:14:38,899
with Apollo 1, and since then, other than
a couple of those unmanned Saturn V launches,

205
00:14:38,899 --> 00:14:45,499
and another one on the Saturn I, we committed
to put our three astronauts in a spacecraft

206
00:14:45,499 --> 00:14:47,779
and send them to the Moon.

207
00:14:47,779 --> 00:14:48,779
Yeah.

208
00:14:48,779 --> 00:14:53,579
So we see Apollo 8, 9, and 10 go, for all
intents and purposes, pretty well.

209
00:14:53,579 --> 00:14:55,189
We're getting ready for Apollo 11.

210
00:14:55,189 --> 00:14:56,189
Is this different?

211
00:14:56,189 --> 00:15:00,129
Does it feel different from a processing perspective?

212
00:15:00,129 --> 00:15:02,620
I think it did not.

213
00:15:02,620 --> 00:15:09,279
The process of getting it ready was the same
as the previous ones, and it was well -- and

214
00:15:09,279 --> 00:15:12,279
we looked at it as where we were in the system.

215
00:15:12,279 --> 00:15:15,730
Okay, we accomplished what we had to on this
one, Apollo 8.

216
00:15:15,730 --> 00:15:17,459
Apollo 9 got this done.

217
00:15:17,459 --> 00:15:18,579
It was in Earth orbit.

218
00:15:18,579 --> 00:15:20,129

Okay, Apollo 10 got this done.

219
00:15:20,129 --> 00:15:21,519
Now it's in lunar orbit.

220
00:15:21,519 --> 00:15:28,310
So next step is, yeah, let that Lunar Module
go all the way down there and let the guys

221
00:15:28,310 --> 00:15:30,730
accomplish the objective.

222
00:15:30,730 --> 00:15:36,420
And my take on schedule pressure and that
sort of thing was -- it was kind of coincidental

223
00:15:36,420 --> 00:15:39,710
that it happened when it did.

224
00:15:39,710 --> 00:15:40,870
[ Chuckles ] Coincidental?

225
00:15:40,870 --> 00:15:41,870
Really.

226
00:15:41,870 --> 00:15:42,870
Yeah.

227
00:15:42,870 --> 00:15:43,870
Because, well, it just did.

228
00:15:43,870 --> 00:15:48,120
It ended up playing out that way, but we followed
the progression of events.

229
00:15:48,120 --> 00:15:53,100
We made some modifications along the way as
we found problems and fixed them and developed

230
00:15:53,100 --> 00:15:59,660
more confidence in the system, and it ended up -- but the approach, again, always from

231
00:15:59,660 --> 00:16:04,709
our management was, "Hey, you just do the job right, accomplish all the requirements

232
00:16:04,709 --> 00:16:08,709
and objectives, and then you look up at the clock or the calendar, in this case, and say,

233
00:16:08,709 --> 00:16:10,920
'Okay, now we're ready for the next step.'"

234
00:16:10,920 --> 00:16:17,620
In that case, the next step was Apollo 11, and that first step.

235
00:16:17,620 --> 00:16:22,490
So, for the launch of Apollo 11, where are you and kind of what are you doing during

236
00:16:22,490 --> 00:16:23,519
this time?

237
00:16:23,519 --> 00:16:24,519
Okay.

238
00:16:24,519 --> 00:16:26,839
So my primary assignment is Apollo 12.

239
00:16:26,839 --> 00:16:33,139
I worked Apollo 10, and then we jumped -- And we always had at least two missions in flow

240
00:16:33,139 --> 00:16:34,139
down here.

241
00:16:34,139 --> 00:16:36,410
We had the hardware for that, which was a
lot of hardware.

242
00:16:36,410 --> 00:16:37,410
Yeah.

243
00:16:37,410 --> 00:16:39,790
You know, three, actually four stages of the
rocket.

244
00:16:39,790 --> 00:16:40,790
Yeah.

245
00:16:40,790 --> 00:16:44,550
Two payloads -- the spacecraft, the Lunar
Module, Command Service Module, and all the

246
00:16:44,550 --> 00:16:49,269
stuff that hooked them together -- most important
payload, of course, being the flight crew.

247
00:16:49,269 --> 00:16:50,269
Sure.

248
00:16:50,269 --> 00:16:56,470
So we kind of cycled back and forth, and so
I was on the even-numbered missions in terms

249
00:16:56,470 --> 00:17:04,400
of the campaign of the launch count itself
when our hardware was in Operations and Checkout

250
00:17:04,400 --> 00:17:05,400
Building.

251
00:17:05,400 --> 00:17:10,350
We moved back and forth to different spacecraft
doing particular tests, depending on our expertise.

252
00:17:10,350 --> 00:17:19,550
But when it came to Apollo 11, the primary launch team guy for my position was in the

253
00:17:19,550 --> 00:17:22,440
Control Center in the Operations and Checkout Building.

254
00:17:22,440 --> 00:17:27,440
If we were not part of the primary launch time process, if we needed to come in as a

255
00:17:27,440 --> 00:17:31,190
backup or scrub the next day-type thing, you had an assignment.

256
00:17:31,190 --> 00:17:32,510
But I was not in the Control Room.

257
00:17:32,510 --> 00:17:36,880
In fact, all of us that were not part of that were advised to stay home...

258
00:17:36,880 --> 00:17:37,880
Huh.

259
00:17:37,880 --> 00:17:43,520
...and take some compensatory time, annual leave, or whatever, and be a spectator, which,

260
00:17:43,520 --> 00:17:50,520
and, therefore, to not add to the huge traffic jam which occurred every Apollo mission by

261
00:17:50,520 --> 00:17:54,460
the way, but it was more so because this one was Apollo 11.

262

00:17:54,460 --> 00:17:57,640
But that was kind of lost on us.

263
00:17:57,640 --> 00:18:02,580
Apollo 10, which we just finished, was just
as important, and Apollo 12 will be just as

264
00:18:02,580 --> 00:18:03,580
important.

265
00:18:03,580 --> 00:18:08,640
This is the next one in the queue, and they're
just gonna do more on their mission than we

266
00:18:08,640 --> 00:18:11,400
did the previous, which had been the legacy
up to now.

267
00:18:11,400 --> 00:18:12,640
So I got to be a spectator.

268
00:18:12,640 --> 00:18:20,160
I got to watch with my wife and toddler from
Titusville, where I lived, which was the first

269
00:18:20,160 --> 00:18:21,910
one I was able to watch, by the way.

270
00:18:21,910 --> 00:18:27,030
All the rest of them, I had been in the Control
Room and watching with my little 8-inch black-and-white

271
00:18:27,030 --> 00:18:28,030
television set.

272
00:18:28,030 --> 00:18:33,470
I couldn't wait to get home to watch the replays
on my 18-inch black-and-white TV set.

273

00:18:33,470 --> 00:18:37,690
[ Laughs ] So was that really the life of
that Control Room Engineer?

274
00:18:37,690 --> 00:18:40,740
Your job is to watch your eight-inch screen?

275
00:18:40,740 --> 00:18:49,990
That's it, and handle the discrepancies and
anomalies that come up as they often did back

276
00:18:49,990 --> 00:18:55,130
then -- take over the process of sorting out
whether this isn't going well.

277
00:18:55,130 --> 00:18:56,440
Is it the procedures?

278
00:18:56,440 --> 00:18:58,000
Is it the hardware?

279
00:18:58,000 --> 00:19:02,500
It was seldom the software because we didn't
have any software back then, or the requirements

280
00:19:02,500 --> 00:19:10,020
were asking this hardware to do too much,
'cause it really can't accomplish those specifications

281
00:19:10,020 --> 00:19:11,790
in that environment.

282
00:19:11,790 --> 00:19:18,800
But that was my primary job as a Test Engineer
for the Command Service Module Spacecraft.

283
00:19:18,800 --> 00:19:22,330
And did you have any sort of function once
lift-off happened?

284
00:19:22,330 --> 00:19:26,760
Were you guys involved with the actual landing
operations or the Moon walks?

285
00:19:26,760 --> 00:19:34,830
No, once it was "Tower clear," literally,
our next responsibility came in as participants

286
00:19:34,830 --> 00:19:42,900
in the recovery, but we had a Control Room
active, on call in the event of an anomaly

287
00:19:42,900 --> 00:19:50,140
or somebody needed information from the experience
of the hardware and the testing at the Cape.

288
00:19:50,140 --> 00:19:52,870
We were there to respond to that, yes.

289
00:19:52,870 --> 00:19:56,000
And, of course, that happened on Apollo 13.

290
00:19:56,000 --> 00:19:57,300
Sure.

291
00:19:57,300 --> 00:20:03,390
So I'm assuming that you would have just been
one of the 600 million people worldwide getting

292
00:20:03,390 --> 00:20:04,640
to watch on television.

293
00:20:04,640 --> 00:20:05,640
Exactly.

294
00:20:05,640 --> 00:20:06,640
Yes.

295

00:20:06,640 --> 00:20:07,640
Okay.

296
00:20:07,640 --> 00:20:15,180
I still remember on the grainy black-and-white
TV set the landing process in the afternoon,

297
00:20:15,180 --> 00:20:20,990
and, of course, that night I made it mandatory
-- the kids weren't that old yet, but required

298
00:20:20,990 --> 00:20:26,210
that they be in the living room with mom and
I watching the first step.

299
00:20:26,210 --> 00:20:28,650
That seems like a good way to spend an evening.

300
00:20:28,650 --> 00:20:33,110
Well, it was for me.

301
00:20:33,110 --> 00:20:39,770
There's kind of an anxiety because we know
-- As engineers, you think about all the things

302
00:20:39,770 --> 00:20:40,800
that could go wrong.

303
00:20:40,800 --> 00:20:45,040
So every time something went right, it was
kind of one of these, "Eh, yeah.

304
00:20:45,040 --> 00:20:46,040
Okay.

305
00:20:46,040 --> 00:20:47,040
Okay, yeah.

306
00:20:47,040 --> 00:20:48,040

That worked.

307
00:20:48,040 --> 00:20:50,360
Yeah, there's another good, you know, type
of thing."

308
00:20:50,360 --> 00:20:58,460
So we're probably more into it than the average
spectator, if that makes sense.

309
00:20:58,460 --> 00:21:05,530
But the way I look at it, and the way everybody
else did, too -- hey, we're all part of a

310
00:21:05,530 --> 00:21:07,780
team here to accomplish this.

311
00:21:07,780 --> 00:21:12,450
You don't have to be doing the highly visible
thing on launch day to be an important member

312
00:21:12,450 --> 00:21:15,180
of the team.

313
00:21:15,180 --> 00:21:16,230
You think about it.

314
00:21:16,230 --> 00:21:20,160
Somebody that does a final-recovery parachute
rigging.

315
00:21:20,160 --> 00:21:25,131
That happened in the "O" and "C" Building
weeks, month before launch, and then they

316
00:21:25,131 --> 00:21:32,210
stamp a procedure that says, "Oh, I did this
correctly, and I'm certifying it was done

317

00:21:32,210 --> 00:21:33,210
right."

318
00:21:33,210 --> 00:21:37,450
Well, they just gave a "Go" for launch just
as important as the one that somebody does

319
00:21:37,450 --> 00:21:42,120
in the Control Room with a headset on at T-minus
whatever minutes and all the attention and

320
00:21:42,120 --> 00:21:44,130
visibility that that got, so...

321
00:21:44,130 --> 00:21:49,360
And the important thing is, that person -- using
that example, that parachute rigging -- knew

322
00:21:49,360 --> 00:21:57,000
that what they were doing was important and
that it had to work, and that's what made

323
00:21:57,000 --> 00:22:04,850
every member of the team feel like I'm part
of a something that's much bigger than me

324
00:22:04,850 --> 00:22:11,480
because people are giving those go's for launch
all around the center, in some places elsewhere

325
00:22:11,480 --> 00:22:14,830
around the program just like I am right now.

326
00:22:14,830 --> 00:22:23,090
So they should naturally celebrate and take
pride in that first step, so to speak.

327
00:22:23,090 --> 00:22:26,950
Did you find a similar mentality with your
coworkers at the time -- just kind of that,

328
00:22:26,950 --> 00:22:30,890
like, at least a moment to kind of just, "We did it.

329
00:22:30,890 --> 00:22:32,350
We accomplished the task."

330
00:22:32,350 --> 00:22:33,910
Oh, yeah.

331
00:22:33,910 --> 00:22:34,910
Absolutely.

332
00:22:34,910 --> 00:22:39,880
And, of course, you know, we're considered to be, well, you're the launch team.

333
00:22:39,880 --> 00:22:45,450
You get it off the ground, and then after that, okay, your responsibility is over, and

334
00:22:45,450 --> 00:22:49,050
that sort of thing, but the way we look at it is the way I explained earlier with the

335
00:22:49,050 --> 00:22:50,050
Chief Engineer.

336
00:22:50,050 --> 00:22:57,150
He said, "No, it's not done until the crew gets out, gets back on Earth, and then you

337
00:22:57,150 --> 00:22:58,650
can really celebrate."

338
00:22:58,650 --> 00:22:59,650
Sure.

339
00:22:59,650 --> 00:23:06,370
So we're now five decades removed from that
historic moment -- those historic moments.

340
00:23:06,370 --> 00:23:08,380
As you reflect back, what's your takeaway?

341
00:23:08,380 --> 00:23:10,940
Like, how do you process that today?

342
00:23:10,940 --> 00:23:20,560
Well, it's -- I think it's a reason to be
kind of celebratory over the accomplishment,

343
00:23:20,560 --> 00:23:27,580
and, from a personal standpoint, we felt,
okay, we're on a mission with the work we

344
00:23:27,580 --> 00:23:28,580
do.

345
00:23:28,580 --> 00:23:35,070
Every day or night we go to work, again, I'm
looked upon by the public and the Administration

346
00:23:35,070 --> 00:23:42,940
at that time as I'm on a mission that the
country has decided to embark upon.

347
00:23:42,940 --> 00:23:51,710
So what I do is important, and the fact that
Apollo 11 happened to be the one where the

348
00:23:51,710 --> 00:23:52,840
mission planner said, "Okay.

349
00:23:52,840 --> 00:23:53,840
Now it's the one.

350
00:23:53,840 --> 00:24:01,640
We're ready to actually go out on the Moon"
was not from the standpoint of looking at

351
00:24:01,640 --> 00:24:02,920
it as a big deal.

352
00:24:02,920 --> 00:24:04,410
It was not a big deal.

353
00:24:04,410 --> 00:24:08,550
You know, it was important now in hindsight,
50 years later.

354
00:24:08,550 --> 00:24:14,470
Well, okay, it was a big deal, but we never
got -- and I feel I'm speaking for the others

355
00:24:14,470 --> 00:24:20,970
-- got caught up in, at the time, in that
euphoria, that, oh, boy, this one's Apollo

356
00:24:22,970 --> 00:24:21,970
11.

357
00:24:22,970 --> 00:24:28,130
You know, well, I know it's Apollo 11, but
Apollo 12 -- You know, you're only as good

358
00:24:28,130 --> 00:24:30,010
as your next mission.

359
00:24:30,010 --> 00:24:31,030
Sure.

360
00:24:31,030 --> 00:24:32,940
So my focus is here.

361

00:24:32,940 --> 00:24:35,780
Yeah, that's good and that's important and
we got it done.

362
00:24:35,780 --> 00:24:36,780
Yay.

363
00:24:36,780 --> 00:24:38,910
Now, don't lose sight of the ball.

364
00:24:38,910 --> 00:24:39,910
Yeah.

365
00:24:39,910 --> 00:24:45,480
Any words of wisdom for those that are working
on the next giant leap for mankind?

366
00:24:45,480 --> 00:24:49,670
Well, never lose sight of the number-one priority.

367
00:24:49,670 --> 00:24:57,350
That's first and foremost, which is the crew
and their mission and accomplishing that safely,

368
00:24:57,350 --> 00:25:01,570
and then you can enjoy the mission success.

369
00:25:01,570 --> 00:25:04,450
Be patient.

370
00:25:04,450 --> 00:25:13,051
Never get caught up in the rush to meet a
milestone or worry about the cost, and that

371
00:25:13,051 --> 00:25:16,570
was another one of the things that made Apollo
successful.

372
00:25:16,570 --> 00:25:20,070

As journeyman engineers, we said, now, you
don't worry about schedules.

373
00:25:20,070 --> 00:25:24,950
You need a realistic schedule, and if this
is not realistic, you tell us and don't worry

374
00:25:24,950 --> 00:25:27,990
about what it costs because we're going to
the Moon.

375
00:25:27,990 --> 00:25:29,890
This is a national resolve.

376
00:25:29,890 --> 00:25:35,650
So don't make a decision based on worrying
about what this is gonna cost.

377
00:25:35,650 --> 00:25:41,760
If this is the right way to go, this is the
way you do it.

378
00:25:41,760 --> 00:25:45,920
And you have to approach that the same way
if you're working.

379
00:25:45,920 --> 00:25:53,410
Don't compromise what will work and is safe
just because you're worried about what it

380
00:25:53,410 --> 00:26:05,290
will cost in terms of schedule or the bucks,
and it's a -- And enjoy what you're doing.

381
00:26:05,290 --> 00:26:06,530
Be a member of the team.

382
00:26:06,530 --> 00:26:10,760
I think that's more difficult nowadays than
it was then.

383
00:26:10,760 --> 00:26:16,200
We didn't have the technology where you could
communicate by e-mails and cellphones.

384
00:26:16,200 --> 00:26:23,290
If you wanted to talk to somebody, you usually
got up and went over and talked to that person

385
00:26:23,290 --> 00:26:28,450
because there weren't that many involved in
the process down here, and we didn't have

386
00:26:28,450 --> 00:26:36,610
the communications capabilities we have today,
and communication is important in a team effort,

387
00:26:36,610 --> 00:26:42,550
and then you build more cohesiveness if you
get together, sit down across the table, or

388
00:26:42,550 --> 00:26:43,950
in big meetings, and we had a lot of meetings.

389
00:26:43,950 --> 00:26:45,030
We had a lot of meetings.

390
00:26:45,030 --> 00:26:46,929
'Cause we didn't have the other way to communicate.

391
00:26:46,929 --> 00:26:47,929
[ Laughs ]

392
00:26:47,929 --> 00:26:53,990
So everybody had a feel for everyone else
who was a participant and their responsibilities,

393
00:26:53,990 --> 00:26:58,240
and you wanted them to be successful just

like you wanted to be successful.

394
00:26:58,240 --> 00:27:07,730
Because if they weren't set up to succeed,
then nobody succeeds, if that makes sense.

395
00:27:07,730 --> 00:27:09,910
So be a team player for sure.

396
00:27:09,910 --> 00:27:17,110
Do your homework and never lose sight of the
primary objective.

397
00:27:17,110 --> 00:27:24,850
Apollo was -- It was hard because even though
we had a lot of people involved, technology

398
00:27:24,850 --> 00:27:28,250
didn't streamline things like it does today.

399
00:27:28,250 --> 00:27:31,530
It wasn't there.

400
00:27:31,530 --> 00:27:35,610
So there was a lot of human face-to-face interface.

401
00:27:35,610 --> 00:27:37,230
You spent long hours, long weeks.

402
00:27:37,230 --> 00:27:38,310
It was hard on families.

403
00:27:38,310 --> 00:27:39,310
Yeah.

404
00:27:39,310 --> 00:27:41,010
You got to make that point.

405

00:27:41,010 --> 00:27:43,720
The term I use -- "Only the strong survive."

406
00:27:43,720 --> 00:27:47,380
And credit those families, particularly the
spouses of the workers, and most of us were

407
00:27:47,380 --> 00:27:54,330
guys back then, that did keep the family unit
together.

408
00:27:54,330 --> 00:28:01,830
And I think another item to consider is, if
we're comparing back to the '60s, we are a

409
00:28:01,830 --> 00:28:06,360
more risk-adverse society today than we were
back then.

410
00:28:06,360 --> 00:28:09,550
Now, that could be the view of a guy getting
old and cynical...

411
00:28:09,550 --> 00:28:10,610
[ Laughs ]

412
00:28:10,610 --> 00:28:19,520
...but we are, and there's a difference between
measuring and assessing a risk and gambling.

413
00:28:19,520 --> 00:28:20,900
Yeah.

414
00:28:20,900 --> 00:28:28,150
And so you don't want to get in the gamble
part of it, particularly when human lives

415
00:28:28,150 --> 00:28:31,610
are involved.

416
00:28:31,610 --> 00:28:33,300
You just -- You don't.

417
00:28:33,300 --> 00:28:38,690
But, on the other hand, don't be afraid to
accept the risk after you've looked at every

418
00:28:38,690 --> 00:28:45,851
aspect of it technically, and the other side
effects of it and decide that -- and have

419
00:28:45,851 --> 00:28:50,690
others look at it to accept the risk.

420
00:28:50,690 --> 00:28:56,850
Again, if the goal is worth the risk, stop
worrying about it and go do it.

421
00:28:56,850 --> 00:28:57,850
Cool.

422
00:28:57,850 --> 00:29:00,200
Bob, it's a pleasure to have you.

423
00:29:00,200 --> 00:29:01,200
Thanks for stopping by.

424
00:29:01,200 --> 00:29:02,200
All right.

425
00:29:02,200 --> 00:29:03,200
Well, I enjoyed it.

426
00:29:03,200 --> 00:29:04,200
Yeah.

427
00:29:04,200 --> 00:29:07,990
I look forward to the next piece of the great

adventure, which has already started because

428
00:29:07,990 --> 00:29:11,130
we've been given a goal, right?

429
00:29:11,130 --> 00:29:12,320
Absolutely.

430
00:29:12,320 --> 00:29:16,890
We tracked down Milt Heflin, one of the guys
who worked Recovery Operations in the Pacific

431
00:29:16,890 --> 00:29:20,970
Ocean when Apollo 11 returned from the Moon.

432
00:29:20,970 --> 00:29:24,870
He was actually pretty easy to find as he
is currently lending his expertise to the

433
00:29:24,870 --> 00:29:28,120
team developing Orion Recovery procedures.

434
00:29:28,120 --> 00:29:32,350
And he brought along one of his colleagues
-- actually, the NASA Landing and Recovery

435
00:29:32,350 --> 00:29:36,500
Director for Exploration Ground Systems, Melissa
Jones.

436
00:29:36,500 --> 00:29:38,960
All right.

437
00:29:38,960 --> 00:29:43,070
I'm in the booth now with Milt Heflin and
Melissa Jones.

438
00:29:43,070 --> 00:29:45,250
Thank you both for joining me today.

439
00:29:45,250 --> 00:29:46,250
Thanks for having us.

440
00:29:46,250 --> 00:29:47,250
You bet.

441
00:29:47,250 --> 00:29:49,740
So, I want to kind of go back a little bit.

442
00:29:49,740 --> 00:29:54,850
So, Milt, you actually worked Recovery for
the Apollo Program back in the '60s.

443
00:29:54,850 --> 00:29:55,850
Correct?

444
00:29:55,850 --> 00:29:56,850
I did.

445
00:29:56,850 --> 00:30:01,620
I was on the primary recovery ship for the
splashdowns of eight Apollo missions.

446
00:30:01,620 --> 00:30:02,620
Man.

447
00:30:02,620 --> 00:30:04,870
So, let's go back a little bit further than
that.

448
00:30:04,870 --> 00:30:09,210
What's it like kind of growing up -- 'Cause
when you were growing up, there were no astronauts.

449
00:30:09,210 --> 00:30:10,210
Correct.

450

00:30:10,210 --> 00:30:16,070
So, what's that like to kind of get into the
world of NASA and get a job working on plucking

451
00:30:16,070 --> 00:30:18,320
astronauts out of the ocean?

452
00:30:18,320 --> 00:30:24,210
Well, [Laughs] I had not planned to come to
work for NASA.

453
00:30:24,210 --> 00:30:30,471
I was going to continue school, Oklahoma State
University, working on my Master's, but a

454
00:30:30,471 --> 00:30:34,720
good friend of mine, who had relatives in
Houston, came down during spring break of

455
00:30:34,720 --> 00:30:37,180
our senior year, and he got hired.

456
00:30:37,180 --> 00:30:41,710
He just showed up on site, and they had tables
set up, and he came back and said, "They're

457
00:30:41,710 --> 00:30:42,710
looking for people."

458
00:30:42,710 --> 00:30:45,250
So that's how I started, how I got involved.

459
00:30:45,250 --> 00:30:49,960
So I didn't have a clue what I was getting
into when I started except I knew I would

460
00:30:49,960 --> 00:30:55,820
be working -- associated with landing and
recovery for Apollo.

461
00:30:55,820 --> 00:31:02,620
And I don't think I ever -- I don't think
I ever worried about the fact that I didn't

462
00:31:02,620 --> 00:31:07,350
know what the hell I'm doing, but I'm learning
it as I go along, and there was plenty of

463
00:31:07,350 --> 00:31:08,350
room to do that.

464
00:31:08,350 --> 00:31:11,840
Now, is that how life was at NASA in the '60s?

465
00:31:11,840 --> 00:31:15,300
I mean, that's what I hear is that it's kind
of like people got hired and they were like,

466
00:31:15,300 --> 00:31:18,720
"We think we're gonna do this, go figure it
out."

467
00:31:18,720 --> 00:31:20,080
We had free rein, basically.

468
00:31:20,080 --> 00:31:26,711
I mean, that's what I think was so beautiful
about that period of time is that I could

469
00:31:26,711 --> 00:31:31,950
go over a number of tests where I was involved
in during those days where there was no Test

470
00:31:31,950 --> 00:31:32,950
Review Board.

471
00:31:32,950 --> 00:31:37,880
In some cases, there were no procedures other
than we wanted to go do this and try that,

472
00:31:37,880 --> 00:31:41,950
and if that didn't work, and it was a piece
of hardware or something, take it back to

473
00:31:41,950 --> 00:31:46,550
the shop, go grind on it, bring it back out,
put it on the capsule, run a test, and see

474
00:31:46,550 --> 00:31:51,620
if it worked, and then when you're done, you
know -- I don't remember -- I don't remember

475
00:31:51,620 --> 00:31:55,610
everything followed up with a drawing, either.

476
00:31:55,610 --> 00:31:58,350
[ Laughs ] So, were you an engineer?

477
00:31:58,350 --> 00:31:59,350
Were you a technician?

478
00:31:59,350 --> 00:32:00,521
Like, how would you have described yourself?

479
00:32:00,521 --> 00:32:08,050
I was a Recovery Engineer -- a degree in Physics
and Math, but I was categorized as a Recovery

480
00:32:08,050 --> 00:32:14,780
Engineer, and I worked in a section that was
System Suitability Section -- a weird name,

481
00:32:14,780 --> 00:32:23,500
but, basically, our job was to take the hardware
that was being built to recover the Apollo

482
00:32:23,500 --> 00:32:27,760
and test its suitability for doing that job.

483
00:32:27,760 --> 00:32:31,360
So it was called the System Suitability Section.

484
00:32:31,360 --> 00:32:39,770
So everything to connect with splashdown and
recovery we got involved with some way and

485
00:32:39,770 --> 00:32:47,220
either tested -- Well, we tested in a water
tank there at the Johnson Space Center -- Manned

486
00:32:47,220 --> 00:32:50,970
Spacecraft Center back then, and then we were
close to the Gulf of Mexico, so we would go

487
00:32:50,970 --> 00:32:51,970
out.

488
00:32:51,970 --> 00:32:57,010
We had our own boat that we used to take the
capsules out into the Galveston Bay or out

489
00:32:57,010 --> 00:33:01,500
in the Gulf and do tests.

490
00:33:01,500 --> 00:33:04,820
the '60s?

491
00:33:04,820 --> 00:33:06,050
Is there a typical day?

492
00:33:06,050 --> 00:33:10,150
Is this kind of like a just, hey, we know
what the ultimate goal is and just whatever

493
00:33:10,150 --> 00:33:11,590
it takes to get it done?

494
00:33:11,590 --> 00:33:18,430
Yes, the last thing you said, Josh, I think
is exactly what that was about.

495
00:33:18,430 --> 00:33:26,550
We had an idea, and we were free to just go
grab a handful of technicians, folks who would

496
00:33:26,550 --> 00:33:34,030
be involved in setting up a test, and, a lot
of times, just making it up as we went along.

497
00:33:34,030 --> 00:33:38,930
But we had a concept that we wanted to get
to, and we weren't exactly clear how we're

498
00:33:38,930 --> 00:33:43,850
gonna do that, but we didn't spend a lot of
time thinking about it other than just going

499
00:33:43,850 --> 00:33:47,120
and starting to do it and do it as we went
along.

500
00:33:47,120 --> 00:33:53,980
Did you feel a sense of pressure or a sense
of -- I guess I ask the question like, was

501
00:33:53,980 --> 00:33:58,410
there pressure that we had to kind of be done
by the end of '69?

502
00:33:58,410 --> 00:34:06,890
I don't think that I -- You know, I don't
think I ever thought in terms of pressure.

503
00:34:06,890 --> 00:34:12,580
You know, I was learning the trade, basically,
and I had a mentor, and so I just basically

504
00:34:12,580 --> 00:34:21,960
would follow him around and learn on how things
were being done back in that timeframe.

505
00:34:21,960 --> 00:34:26,850
We didn't spend a lot of time thinking about
-- I think spending a lot of time worrying

506
00:34:26,850 --> 00:34:32,020
about the future more than what we had to
do today to do what needed to be done that

507
00:34:32,020 --> 00:34:33,929
day or that week and get it done.

508
00:34:33,929 --> 00:34:35,360
That's just what we did.

509
00:34:35,360 --> 00:34:39,690
So, Melissa, certainly not to leave you out
of the conversation, but definitely kind of

510
00:34:39,690 --> 00:34:40,970
setting a stage there.

511
00:34:40,970 --> 00:34:41,970
Mm-hmm.

512
00:34:41,970 --> 00:34:44,909
As you've worked with Milt and as you've spent
time kind of working on Recovery Operations

513
00:34:44,909 --> 00:34:51,679
for Orion -- or doing testing now, getting
ready for the future -- how are the stories

514
00:34:51,679 --> 00:34:55,120
that you hear -- how do you relate to those
with our culture today?

515
00:34:55,120 --> 00:34:58,510
That's so funny that you would ask that 'cause,
so, first I'd say that having Milt on the

516
00:34:58,510 --> 00:35:01,290
team is really like a breath of fresh air
a lot of the time.

517
00:35:01,290 --> 00:35:06,300
He's very encouraging, and the team loves
him and to hear his stories and that kind

518
00:35:06,300 --> 00:35:11,750
of stuff, and he will frequently say that
this is a magnitude harder than what they

519
00:35:11,750 --> 00:35:16,270
tried to do on Apollo, and we have a lot more
people on the team, I think, who have their

520
00:35:16,270 --> 00:35:24,270
fingers in discussions and a lot more paperwork
and traceability and the types of things that

521
00:35:24,270 --> 00:35:27,370
I think maybe have the freedom to do differently.

522
00:35:27,370 --> 00:35:32,520
One of the examples, right now, I would say,
we're working on a strobe objective.

523
00:35:32,520 --> 00:35:36,290
We're trying to -- There's a strobe that goes
on the capsule so that you can see it in event

524
00:35:36,290 --> 00:35:38,880
of an emergency landing, or if you land at
night.

525
00:35:38,880 --> 00:35:39,880
Okay.

526
00:35:39,880 --> 00:35:45,220
And I think, Milt, you had a strobe, as well,
and we're trying to develop the test plan,

527
00:35:45,220 --> 00:35:49,280
understand all the parameters, and get all
the permissions, and, you know, Milt's told

528
00:35:49,280 --> 00:35:54,830
me that they just sit on top of the roof at
JSC and make sure they can see the light from

529
00:35:54,830 --> 00:35:56,870
Galveston Bay, and here we are.

530
00:35:56,870 --> 00:35:57,870
[ Laughs ]

531
00:35:57,870 --> 00:36:01,360
We're trying to put all these procedures and
plans and timelines and schedules and stuff

532
00:36:01,360 --> 00:36:05,030
together to do a 45-minute test.

533
00:36:05,030 --> 00:36:12,290
So I would say it's definitely different than
some of the things that Milt was able to enact

534
00:36:12,290 --> 00:36:15,460
in Apollo with the culture that they had back
then.

535
00:36:15,460 --> 00:36:17,460
So -- And this is a question for either of
you.

536
00:36:17,460 --> 00:36:19,960
How would I summarize that difference?

537
00:36:19,960 --> 00:36:23,510
Is it a nature of kind of working towards repeatability?

538
00:36:23,510 --> 00:36:24,950
Is it working towards precision?

539
00:36:24,950 --> 00:36:27,970
Like, what's a way to classify that?

540
00:36:27,970 --> 00:36:29,350
Why it's so different?

541
00:36:29,350 --> 00:36:30,350
Yeah.

542
00:36:30,350 --> 00:36:31,350
Like, what's the difference?

543
00:36:31,350 --> 00:36:33,510
Like, if you could summarize it, what's the difference?

544
00:36:33,510 --> 00:36:34,510
I don't –

545
00:36:34,510 --> 00:36:35,950
Oh, Melissa.

546
00:36:35,950 --> 00:36:38,400
That's kind of tough.

547
00:36:38,400 --> 00:36:50,230
I think -- Well, as NASA grew up, right or

wrong -- and I hardly judge, but various processes

548
00:36:50,230 --> 00:36:54,350
changed, requirements changed.

549
00:36:54,350 --> 00:36:58,420
We did a lot of things that I would -- I would
tell you right now, 'cause I was involved

550
00:36:58,420 --> 00:37:04,520
in some -- we did a number of things that
we were not safe when we did them.

551
00:37:04,520 --> 00:37:10,870
I mean, when we were doing some work, we were
not really safe, and we were fortunate, very

552
00:37:10,870 --> 00:37:12,950
fortunate a number of times.

553
00:37:12,950 --> 00:37:13,950
Sure.

554
00:37:13,950 --> 00:37:20,360
Well, throughout the period of time from back
then to now, we've all been through tragedies

555
00:37:20,360 --> 00:37:21,810
in this program.

556
00:37:21,810 --> 00:37:22,900
Agreed.

557
00:37:22,900 --> 00:37:37,840
And so along the way, new requirements come
into play, and there's a greater attempt to

558
00:37:37,840 --> 00:37:44,750
do things smartly and safely at the same time,

and that sometimes is a real hard thing to

559
00:37:44,750 --> 00:37:45,750
do.

560
00:37:45,750 --> 00:37:51,390
But I do think that it's all in a positive
effort to have proper traceability, proper

561
00:37:51,390 --> 00:37:58,290
accountability, proper visibility to those
who are accepting risk for the certain tests

562
00:37:58,290 --> 00:38:02,790
that we're doing or the certain flights that
we're doing, and so I think that it's all

563
00:38:02,790 --> 00:38:05,120
with the right idea.

564
00:38:05,120 --> 00:38:09,900
I don't believe when Apollo started, you guys
had a Safety and Mission Assurance organization,

565
00:38:09,900 --> 00:38:15,910
and I think we've grown into that culture
as we've had some lessons learned and some

566
00:38:15,910 --> 00:38:16,910
tragedies.

567
00:38:16,910 --> 00:38:17,910
Sure.

568
00:38:17,910 --> 00:38:22,180
So I think it's an effort to kind of bring
it all back together and make sure that everyone

569
00:38:22,180 --> 00:38:26,380

is comfortable with what we're doing based
on some lessons learned we've had.

570
00:38:26,380 --> 00:38:31,640
But I do think that sometimes you can get
wrapped up in too many boards to make a simple

571
00:38:31,640 --> 00:38:32,640
decision.

572
00:38:32,640 --> 00:38:39,010
So there's probably a balance there that we
could probably strike a little bit better

573
00:38:39,010 --> 00:38:42,670
with some work and analysis on our processes.

574
00:38:42,670 --> 00:38:48,740
The overhead that I've seen that Melissa talks
about, they get through pretty doggone good.

575
00:38:48,740 --> 00:38:56,230
I mean, it's there, and with her leadership
and others, I mean, they get through these

576
00:38:56,230 --> 00:39:05,220
things, and sometimes it's difficult to hear
all that going on, but it's not like it -- I

577
00:39:05,220 --> 00:39:11,860
don't want to say it slows down what you're
really trying to do, but it is a very delicate

578
00:39:11,860 --> 00:39:16,850
balance between that, and that's what I've
seen Melissa and other leaders in the Land

579
00:39:16,850 --> 00:39:22,270
and Recovery -- I mean, I can sense that that's
what they're exactly trying to do is do what

580
00:39:22,270 --> 00:39:27,210
really needs to be done and recognizing what's involved.

581
00:39:27,210 --> 00:39:31,760
So, Milt, you talk about kind of the safety differences.

582
00:39:31,760 --> 00:39:37,450
So back in the '60s, was it a situation where, like, you recognize, "Hey, this is not the

583
00:39:37,450 --> 00:39:40,130
safest way to do this, but we have to go.

584
00:39:40,130 --> 00:39:41,290
We've got to move"?

585
00:39:41,290 --> 00:39:42,290
Is that how this is?

586
00:39:42,290 --> 00:39:43,990
Or is it more in hindsight you're saying like, "Wow.

587
00:39:43,990 --> 00:39:47,110
Like, we got away with some crazy stuff that we didn't realize at the time"?

588
00:39:47,110 --> 00:39:50,580
Well, probably a little bit of all of what you said.

589
00:39:50,580 --> 00:39:55,370
You know, I can think of some things that I was involved in relative to testing, and

590
00:39:55,370 --> 00:40:03,580

it's like we got what we needed to get done,
and in retrospect, not so much then, but years

591
00:40:03,580 --> 00:40:08,100
later, when you think about that, you're thinking,
"Well, that was -- You know, we were lucky

592
00:40:08,100 --> 00:40:17,641
that we didn't really injure somebody when
we were doing that," and that's just the way

593
00:40:17,641 --> 00:40:20,750
it was.

594
00:40:20,750 --> 00:40:25,850
As we kind of think about this idea of safety,
and we kind of mention the idea of crew losses,

595
00:40:25,850 --> 00:40:30,470
back in the '60s, obviously there was this
race against Russia.

596
00:40:30,470 --> 00:40:34,330
We lost the Apollo 1 crew very tragically.

597
00:40:34,330 --> 00:40:40,090
How did that really impact the progress and
the process for you guys?

598
00:40:40,090 --> 00:40:43,790
And then kind of, Melissa, as a follow-up
for you, how are you learning from kind of

599
00:40:43,790 --> 00:40:47,190
that perspective from the Apollo generation?

600
00:40:47,190 --> 00:40:59,369
Well, so going back to Apollo 1 and the fire,
it is remarkable what we did in this nation

601
00:40:59,369 --> 00:41:01,090
after that.

602
00:41:01,090 --> 00:41:06,960
I mean, you talk about gutsy work going on.

603
00:41:06,960 --> 00:41:08,320
Yeah.

604
00:41:08,320 --> 00:41:16,490
We -- Apollo 7 first manned flight, and then
the gutsiest thing this nation has ever done

605
00:41:16,490 --> 00:41:22,150
in manned spaceflight in my opinion is Apollo
8, the second Apollo mission where we put

606
00:41:22,150 --> 00:41:27,190
that capsule on top of the big Saturn V, and
we went to the Moon -- didn't land on the

607
00:41:27,190 --> 00:41:28,500
Moon, but we went to the Moon.

608
00:41:28,500 --> 00:41:33,680
After one manned test flight of Apollo, we
did that...

609
00:41:33,680 --> 00:41:34,680
Yeah.

610
00:41:34,680 --> 00:41:44,230
...and that, I think, is what really -- really
allowed us to say, you know, once Apollo 8

611
00:41:44,230 --> 00:41:46,211
was done, it was like we're rocking and rolling
here.

612
00:41:46,211 --> 00:41:47,301
We know what we need to do.

613
00:41:47,301 --> 00:41:53,500
We set up the management structure back then,
set up the right kind of things that had to

614
00:41:53,500 --> 00:42:01,010
be done on Apollo 9, Apollo 10, leading up
to Apollo 11 -- stepping stones that all worked,

615
00:42:01,010 --> 00:42:06,780
and, Josh, I might have got off the subject
of your question, so I'm...

616
00:42:06,780 --> 00:42:07,820
No, that's all right.

617
00:42:07,820 --> 00:42:11,850
No, it's good stuff, 'cause, again, I think
it's coming back to that reality of, hey,

618
00:42:11,850 --> 00:42:19,180
how do we, like, honor, sacrifice, and make
good decisions for the future, and so, Melissa,

619
00:42:19,180 --> 00:42:22,590
again, over to you kind of asking the question
like, how does the team kind of process the

620
00:42:22,590 --> 00:42:26,600
fact that you're gonna go pull astronauts
out of the ocean after what is, hopefully,

621
00:42:26,600 --> 00:42:27,960
a very successful flight?

622
00:42:27,960 --> 00:42:33,080
Yes, I would say that I think part of your

question was how have we changed maybe from

623
00:42:33,080 --> 00:42:36,869
Apollo and how we learned from the loss that
we've had, and I think that we've learned

624
00:42:36,869 --> 00:42:41,630
a lot from lessons Apollo and the Space Shuttle
Program brought us about incremental testing

625
00:42:41,630 --> 00:42:48,250
and risk acceptance and redundancy and tolerance
and margins and factors of safety and design

626
00:42:48,250 --> 00:42:56,730
standards and what we feel is acceptable for
putting humans -- human people in a giant

627
00:42:56,730 --> 00:43:01,810
rocket that has, you know, explosives and
cryogenics and different things in it, right,

628
00:43:01,810 --> 00:43:07,770
so that we can get to space, and so I think,
you know, we have learned from every single

629
00:43:07,770 --> 00:43:11,440
-- not just tragedy, but all of the successes
that we've had.

630
00:43:11,440 --> 00:43:16,980
We learn from successes that other people,
like ULA and SpaceX and Boeing have had.

631
00:43:16,980 --> 00:43:22,910
Any success in the space industry is success
for all of us, and we learn things from that.

632
00:43:22,910 --> 00:43:25,500
We are excited.

633
00:43:25,500 --> 00:43:31,460
We did go from Apollo to water landings to
Space Shuttle land landings, and now we're

634
00:43:31,460 --> 00:43:36,210
back into the water landings, and I would
say that Milt is the only one on the team

635
00:43:36,210 --> 00:43:40,280
that really has any experience with that,
because those of us who have human spaceflight

636
00:43:40,280 --> 00:43:44,160
experience are from the International Space
Station Program or from Shuttle.

637
00:43:44,160 --> 00:43:45,160
Right.

638
00:43:45,160 --> 00:43:49,090
So that's one of the reasons why he's so valuable
on the team, and he helps us with a lot of

639
00:43:49,090 --> 00:43:53,340
the things that Apollo did in their flight
rules and their weather conditions and where

640
00:43:53,340 --> 00:43:58,710
did they have issues, and so we're all very
excited about what we're doing, but we're

641
00:43:58,710 --> 00:44:04,900
trying to be very meticulous with our testing,
with our procedures, with our safety culture.

642
00:44:04,900 --> 00:44:08,900
We work with the Navy again just like they
worked with the Navy a little bit in a different

643
00:44:08,900 --> 00:44:14,700
ship configuration, but there are some similarities
to the way that Apollo did recovery to what

644
00:44:14,700 --> 00:44:17,510
we're trying to do now.

645
00:44:17,510 --> 00:44:22,670
Milt, were you there when Apollo 11 came back
and did you help get the "Eagle" out of the

646
00:44:22,670 --> 00:44:23,670
water?

647
00:44:23,670 --> 00:44:27,260
I guess it wasn't the "Eagle," 'cause the
"Eagle" is on the Moon.

648
00:44:27,260 --> 00:44:28,260
That's right.

649
00:44:28,260 --> 00:44:29,500
The "Columbia" was the Command Module --

650
00:44:29,500 --> 00:44:30,500
Thank you.

651
00:44:30,500 --> 00:44:31,500
...yeah, for Apollo 11.

652
00:44:31,500 --> 00:44:35,110
Well, I had many different jobs back in the
Apollo days.

653
00:44:35,110 --> 00:44:40,490
Apollo 11, I met the "Hornet," "USS Hornet"
at Pearl Harbor.

654

00:44:40,490 --> 00:44:47,440
When the ship got back to Pearl Harbor, I
was one of two NASA engineers that oversaw

655
00:44:47,440 --> 00:44:54,330
the contractor team that safed the Command
Module for air transport back to the United

656
00:44:54,330 --> 00:44:57,620
States -- back to the continental United States.

657
00:44:57,620 --> 00:44:59,590
So, for Apollo 11, that's what I did.

658
00:44:59,590 --> 00:45:02,670
I was one of the two team leaders.

659
00:45:02,670 --> 00:45:09,730
We did over about a 48-hour period nonstop,
had the contractor team safe the Command Module,

660
00:45:09,730 --> 00:45:18,470
and then load it up into a four-engine turboprop
cargo carrier.

661
00:45:18,470 --> 00:45:24,670
This is back during the Vietnam time, so this
is about the only aircraft that we could use

662
00:45:24,670 --> 00:45:28,100
that could make the jump from Hawaii over
to the West Coast.

663
00:45:28,100 --> 00:45:34,860
That aircraft, I guarantee you, Josh, I'm
surprised the rivets stayed in that airplane

664
00:45:34,860 --> 00:45:37,710
when we flew that thing back over here.

665
00:45:37,710 --> 00:45:38,710
[ Laughs ]

666
00:45:38,710 --> 00:45:40,640
That thing shaked, rattled, and rolled the
entire time.

667
00:45:40,640 --> 00:45:48,320
So I was the NASA guy on board the airplane
that went all the way back to Houston with

668
00:45:48,320 --> 00:45:53,980
the Command Module to attach it to the Lunar
Receiving Laboratory for further processing

669
00:45:53,980 --> 00:45:54,980
when we were done.

670
00:45:54,980 --> 00:45:58,290
So, did you get to see Neil, Buzz, and Michael
when they came back?

671
00:45:58,290 --> 00:46:04,470
I saw them being taken off of the ship in
a mobile quarantine facility that they had.

672
00:46:04,470 --> 00:46:05,470
Sure.

673
00:46:05,470 --> 00:46:12,190
I saw that happening, but just from down on
the deck or down on the dock, seeing them

674
00:46:12,190 --> 00:46:14,750
being picked up inside that trailer.

675
00:46:14,750 --> 00:46:15,820
Cool.

676
00:46:15,820 --> 00:46:16,820
That's awesome.

677
00:46:16,820 --> 00:46:20,770
So, Melissa, what's the plan for you as far
as with Orion, where are you expecting to

678
00:46:20,770 --> 00:46:24,220
be located for Orion Recovery?

679
00:46:24,220 --> 00:46:30,460
So we'll be on a ship, a landing-platform
docked ship off the coast of San Diego.

680
00:46:30,460 --> 00:46:34,920
The primary landing location's about 38 to
50 nautical miles off the coast.

681
00:46:34,920 --> 00:46:40,730
I, specifically, will be in the landing area.

682
00:46:40,730 --> 00:46:43,630
They call it the C.I.C.

683
00:46:43,630 --> 00:46:44,760
Combat...

684
00:46:44,760 --> 00:46:45,900
Gosh.

685
00:46:45,900 --> 00:46:47,440
Combat Information Center, I think.

686
00:46:47,440 --> 00:46:49,020
Combat Information Center on the ship.

687
00:46:49,020 --> 00:46:53,740
It's where they run ops on the ship when they

have different operations that they run.

688
00:46:53,740 --> 00:46:59,450
So that's where I will be, along with Public Affairs and a few other folks, and we'll have

689
00:46:59,450 --> 00:47:02,700
access to the bridge where the captain's at, and we'll have access to the folks who are

690
00:47:02,700 --> 00:47:05,530
doing the actual operation in the open water.

691
00:47:05,530 --> 00:47:10,510
So we'll be physically located on the ship when we do the Recovery.

692
00:47:10,510 --> 00:47:14,220
So you thought about what it will be like to greet astronauts coming back from the Moon

693
00:47:14,220 --> 00:47:15,220
someday?

694
00:47:15,220 --> 00:47:16,220
[ Chuckles ]

695
00:47:16,220 --> 00:47:19,520
Yes, actually, it's quite mind-blowing to think about to be perfectly honest, and, you

696
00:47:19,520 --> 00:47:21,470
know, what do you say to them?

697
00:47:21,470 --> 00:47:22,830
Is it, "Welcome home"?

698
00:47:22,830 --> 00:47:27,270
[ Laughter ] You know, just something like

that, knowing that we are there to get them

699
00:47:27,270 --> 00:47:30,911
out as quickly as possible and get them to
medical so that they, you know, can start

700
00:47:30,911 --> 00:47:32,730
to recover from being deconditioned.

701
00:47:32,730 --> 00:47:34,960
But, yes, it's historical.

702
00:47:34,960 --> 00:47:39,210
It's a really exciting thing for me to think
about.

703
00:47:39,210 --> 00:47:48,140
And, Milt, kind of as you've worked with the
team in your current role, what's the one

704
00:47:48,140 --> 00:47:52,340
message that you want to leave to the whole
team to kind of help to -- whether it be encourage

705
00:47:52,340 --> 00:47:59,620
or inspire or support them five decades later
from Apollo 11 and the '60s where we landed

706
00:47:59,620 --> 00:48:00,620
on the Moon?

707
00:48:00,620 --> 00:48:03,980
Well, first of all, Melissa made a comment
a while ago.

708
00:48:03,980 --> 00:48:11,210
The thought came up, and that is, many times
as I am participating -- basically, I'm tied

709

00:48:11,210 --> 00:48:21,470
into conferences from my home, and occasionally
we have face-to-face, but many times she doesn't

710
00:48:21,470 --> 00:48:27,960
hear from me, and she doesn't hear from me
because I don't have anything to offer at

711
00:48:27,960 --> 00:48:31,920
that time because what they're doing makes
sense to me.

712
00:48:31,920 --> 00:48:34,950
I mean, I mentioned it a while ago.

713
00:48:34,950 --> 00:48:39,760
This recovery of this spacecraft out of the
water is an order of magnitude, if not two

714
00:48:39,760 --> 00:48:45,500
orders of magnitude more difficult than what
we did back in Apollo, and it's very simple.

715
00:48:45,500 --> 00:48:51,280
Because a program sometime ago decided they
don't want to take mass into orbit that is

716
00:48:51,280 --> 00:48:54,830
gonna be used at the end of the mission only
to pick this thing up.

717
00:48:54,830 --> 00:48:58,650
We had a lifting loop on board the Apollo.

718
00:48:58,650 --> 00:49:02,720
This spacecraft is probably 8,000, 10,000
pounds heavier on the water, and it's about

719
00:49:02,720 --> 00:49:04,080
4 feet diameter, also.

720
00:49:04,080 --> 00:49:05,730
It's bigger, and it's like a cork.

721
00:49:05,730 --> 00:49:07,490
It sits on top of the water.

722
00:49:07,490 --> 00:49:12,109
And so they had no way to just get big ol'
-- We used bit ol' honking aircraft carriers

723
00:49:12,109 --> 00:49:13,780
back in those days.

724
00:49:13,780 --> 00:49:14,910
Right.

725
00:49:14,910 --> 00:49:23,500
And with a crane on board the ship, even though
we augmented that crane, and it was an extremely

726
00:49:23,500 --> 00:49:24,710
simple operation.

727
00:49:24,710 --> 00:49:35,020
So it's remarkable how they have -- I've watched
this develop where you drag in the Orion capsule

728
00:49:35,020 --> 00:49:42,350
mock-up into the well deck ship, and, I mean,
it has turned out to be a very elegant way

729
00:49:42,350 --> 00:49:51,930
to -- It looks weird, but it's a very elegant
way to take advantage of physics and be sure

730
00:49:51,930 --> 00:49:57,890
that you're tending this 20-some-thousand-pound
vehicle as you bring it into the well deck.

731
00:49:57,890 --> 00:50:01,980
I probably got straight off on something there,
but that's -- [ Laughs ]

732
00:50:01,980 --> 00:50:04,040
No, I think it's great.

733
00:50:04,040 --> 00:50:10,470
I think that -- What I hear from you is that
whether it's good or bad, the long processes

734
00:50:10,470 --> 00:50:12,790
are paying off, that we're doing things really
well.

735
00:50:12,790 --> 00:50:19,300
Well, so, yeah, and I got away from part of
your question there.

736
00:50:19,300 --> 00:50:26,830
The concern that I have - and Melissa knows
this, I think, and some of the other key leadership

737
00:50:26,830 --> 00:50:29,060
of the team.

738
00:50:29,060 --> 00:50:37,800
They've got a big team, and there's a tendency
that everyone wants to play on a big team...

739
00:50:37,800 --> 00:50:38,800
Sure.

740
00:50:38,800 --> 00:50:41,440
And not everybody needs to play on a big team.

741
00:50:41,440 --> 00:50:43,990
Our team was much smaller.

742
00:50:43,990 --> 00:50:47,370
The communications during recovery -- I've
often told her.

743
00:50:47,370 --> 00:50:54,359
I said I can recall almost every mission I
was on.

744
00:50:54,359 --> 00:50:59,840
We told the captain of the ship that the spacecraft
was safe on the water, and then he gave the

745
00:50:59,840 --> 00:51:04,360
command for them dropping swimmers in the
water from a helicopter and starting the process,

746
00:51:04,360 --> 00:51:13,619
and the NASA team leaders back then probably
didn't say hardly anything during that entire

747
00:51:13,619 --> 00:51:18,760
hour, hour-and-a-half process to get both
the crew and the Command Module back on the

748
00:51:18,760 --> 00:51:19,760
ship.

749
00:51:19,760 --> 00:51:21,620
I mean, there was no go, no-go's.

750
00:51:21,620 --> 00:51:27,890
The helicopter, the swimmers, the deck force
all knew what to do, when to do it, and how

751
00:51:27,890 --> 00:51:35,030
to do it, and there was no reason to quiz
them about anything, and we were fortunate.

752

00:51:35,030 --> 00:51:40,040
In picking this Apollo up, we never had any
serious problems.

753
00:51:40,040 --> 00:51:42,119
Well, I should not have said.

754
00:51:42,119 --> 00:51:50,900
Apollo 9, we had a wench problem, and we had
to use what was called a Tilly.

755
00:51:50,900 --> 00:51:55,470
It's a big, old crane on board an aircraft
carrier that's used to pick up a downed aircraft

756
00:51:55,470 --> 00:52:00,070
in the water -- pick it up, and it's on the
flight deck.

757
00:52:00,070 --> 00:52:05,700
So we had to use that crane to get the Apollo
9 Command Module back on board, and that was

758
00:52:05,700 --> 00:52:10,040
pretty tricky because there's not a good way
to tend that thing as it's coming all the

759
00:52:10,040 --> 00:52:13,330
way up 40-, 50-some feet.

760
00:52:13,330 --> 00:52:14,390
Awesome.

761
00:52:14,390 --> 00:52:16,410
Melissa, any final thoughts?

762
00:52:16,410 --> 00:52:19,160
No, I just -- not really.

763

00:52:19,160 --> 00:52:25,450
We're excited about the direction that the
agency's moving in with the Moon to Mars Program.

764
00:52:25,450 --> 00:52:27,540
Recovery is ready.

765
00:52:27,540 --> 00:52:29,700
We have our hardware.

766
00:52:29,700 --> 00:52:34,140
We actually are getting ready to move into
what we call Operation.

767
00:52:34,140 --> 00:52:38,880
So we've got hardware that's been verified
and validated and meets all of our requirements

768
00:52:38,880 --> 00:52:41,550
for how we move the capsule around.

769
00:52:41,550 --> 00:52:45,980
It's making sure that we preserve it so that
we can get the data that we need off of it

770
00:52:45,980 --> 00:52:51,180
to verify that we can fly crew for the first
crewed mission, and so I'm very proud of the

771
00:52:55,050 --> 00:52:52,180
team.

772
00:52:55,050 --> 00:53:00,600
In fact, I think some of it will shrink a
little bit now that we're getting our hardware

773
00:53:00,600 --> 00:53:06,359
requirements bought off, but we're excited
and we're ready.

774
00:53:06,359 --> 00:53:07,359
Awesome.

775
00:53:07,359 --> 00:53:11,120
Well, Milt, we're super proud of you and the accomplishments –

776
00:53:11,120 --> 00:53:13,480
Can I tell you one story if you don't mind?

777
00:53:13,480 --> 00:53:14,480
Yeah.

778
00:53:16,480 --> 00:53:15,480
I love the stories.

779
00:53:16,480 --> 00:53:17,480
Milt, fire away, man.

780
00:53:17,480 --> 00:53:18,480
I'm excited.

781
00:53:18,480 --> 00:53:19,480
Here it comes.

782
00:53:19,480 --> 00:53:20,480
I thought about it.

783
00:53:20,480 --> 00:53:24,010
So back -- I talked about Apollo 8.

784
00:53:24,010 --> 00:53:28,640
I need to tell you how part of that happened.

785
00:53:28,640 --> 00:53:31,109
So, setting the scene here.

786

00:53:31,109 --> 00:53:32,980
This is the Christmas Eve trip around the
Moon.

787
00:53:32,980 --> 00:53:34,480
Christmas Eve, 1968.

788
00:53:34,480 --> 00:53:35,480
Right.

789
00:53:35,480 --> 00:53:37,660
It is at the height of the Vietnam War.

790
00:53:37,660 --> 00:53:38,660
Okay.

791
00:53:38,660 --> 00:53:46,570
Forces are all over out there across the Pacific,
and so assets -- ships, planes -- you know,

792
00:53:46,570 --> 00:53:51,560
they're just not -- I mean, they're around,
but it's not like -- It took some effort to

793
00:53:51,560 --> 00:53:52,570
pull that together.

794
00:53:52,570 --> 00:54:01,190
Well, the very first flight director, Chris
Kraft, was the lead flight director back in

795
00:54:01,190 --> 00:54:10,780
those days, and NASA Headquarters wanted him
to go out to Pearl Harbor and meet with Admiral

796
00:54:10,780 --> 00:54:14,210
John McCain from that family.

797
00:54:14,210 --> 00:54:21,040

So he was the Commander in Chief of the Pacific
at that time, and he was to go out there -- Kraft

798
00:54:21,040 --> 00:54:31,020
was to go out there and brief him and his
team about what's needed for Apollo 8, and

799
00:54:31,020 --> 00:54:39,340
so Chris Kraft went out there and gave the
briefing, and this is an example of how -- This

800
00:54:39,340 --> 00:54:45,520
is something that happened back then that
I'm not sure happens today collectively in

801
00:54:45,520 --> 00:54:48,869
our country to do some great things.

802
00:54:48,869 --> 00:54:53,880
What happened back then was when Kraft got
through giving a briefing to an audience of

803
00:54:53,880 --> 00:55:03,500
admirals and generals out there at Pearl Harbor,
Admiral McCain looked at Kraft and looked

804
00:55:03,500 --> 00:55:08,430
at the audience, and he said, "Great briefing.

805
00:55:08,430 --> 00:55:12,210
Give this man what he wants."

806
00:55:12,210 --> 00:55:18,910
And I don't see a lot of that today where
we're trying to do great things, and that's

807
00:55:18,910 --> 00:55:22,200
the big difference to me.

808

00:55:22,200 --> 00:55:26,820
Is it just this kind of authority to say like,
"This is the right thing"...

809
00:55:26,820 --> 00:55:27,820
You betcha.

810
00:55:27,820 --> 00:55:28,820
..."whatever it takes, go do it."

811
00:55:28,820 --> 00:55:29,820
You betcha.

812
00:55:29,820 --> 00:55:35,740
I mean, that was a good example of it -- "Give
this man what he wants" -- back in that timeframe.

813
00:55:35,740 --> 00:55:37,080
Awesome.

814
00:55:37,080 --> 00:55:40,220
And I was on the "Yorktown," which was the
Apollo 8 recovery.

815
00:55:40,220 --> 00:55:46,180
That was my first time to be on a splashdown
of Apollo -- Apollo 8.

816
00:55:46,180 --> 00:55:47,220
What's that feeling like?

817
00:55:47,220 --> 00:55:52,030
You got guys that literally just saw the Moon
from up close -- the first guys ever, right?

818
00:55:52,030 --> 00:55:53,030
[ Chuckling ] Yes.

819
00:55:53,030 --> 00:55:54,030

Yes.

820
00:55:54,030 --> 00:55:55,030
Absolutely.

821
00:55:55,030 --> 00:55:56,030
They come back, and you're getting to pull
them out of the water.

822
00:55:56,030 --> 00:55:57,030
Yes.

823
00:55:57,030 --> 00:55:58,160
What's that feel like?

824
00:55:58,160 --> 00:55:59,349
Well...

825
00:55:59,349 --> 00:56:03,079
[ Laughs ] When they're safely on board the
ship, it really feels good.

826
00:56:03,079 --> 00:56:06,080
[ Laughter ] It really feels good.

827
00:56:06,080 --> 00:56:08,359
And I think Borman was on that crew, if I
recall.

828
00:56:08,359 --> 00:56:10,860
I hope that's right.

829
00:56:10,860 --> 00:56:15,960
So once the crew is on board -- Actually,
the crew got picked up by helicopter.

830
00:56:15,960 --> 00:56:17,940
That's how we did it back in those days.

831
00:56:17,940 --> 00:56:19,740
Then we got the Command Module on board.

832
00:56:19,740 --> 00:56:24,109
It was several hours after the crew had been
on board, I'm down there at the Command Module

833
00:56:24,109 --> 00:56:28,640
with the team, and we're safing it and going
through and de-stowing stuff and packaging

834
00:56:28,640 --> 00:56:29,760
things up, or whatever.

835
00:56:29,760 --> 00:56:35,160
The next thing I know is there's two hands
on my shoulder, shaking me, and it was Frank

836
00:56:35,160 --> 00:56:38,740
Borman just saying, "Looks good, buddy.

837
00:56:38,740 --> 00:56:39,740
How we doing?”

838
00:56:39,740 --> 00:56:40,740
You know?

839
00:56:40,740 --> 00:56:41,740
And that was cool.

840
00:56:41,740 --> 00:56:42,740
Oh, man.

841
00:56:42,740 --> 00:56:44,140
That's got to feel special.

842
00:56:44,140 --> 00:56:45,140
You bet.

843
00:56:47,140 --> 00:56:46,140
Absolutely.

844
00:56:47,140 --> 00:56:50,480
Well, Milt, we're appreciative of your efforts
in the '60s to help us be successful, and

845
00:56:50,480 --> 00:56:54,270
even today, helping us prepare to be successful
once again on our Moon missions.

846
00:56:54,270 --> 00:56:57,661
Melissa, obviously you guys have a big, big
task ahead of you.

847
00:56:57,661 --> 00:56:59,350
I know that you are all up to the challenge...

848
00:56:59,350 --> 00:57:00,350
We are.

849
00:57:00,350 --> 00:57:01,780
...and we're excited for everything that is
to come.

850
00:57:01,780 --> 00:57:03,180
So thank you all, both, for being here.

851
00:57:03,180 --> 00:57:08,030
This team can recover this spacecraft, I guarantee
you, and they're gonna be able to recover

852
00:57:08,030 --> 00:57:09,190
the crew, too.

853
00:57:09,190 --> 00:57:10,190
Thank you.

854
00:57:10,190 --> 00:57:11,340
Thank you, Milt.

855
00:57:11,340 --> 00:57:13,070
Thanks for having us.

856
00:57:13,070 --> 00:57:14,340
You heard it here first.

857
00:57:14,340 --> 00:57:15,840
The team is ready.

858
00:57:15,840 --> 00:57:19,460
They're pumped and getting excited for the
Moon missions coming up in the next few years.

859
00:57:19,460 --> 00:57:22,740
I'm Joshua Santora, and that's our show.

860
00:57:22,740 --> 00:57:24,560
Thanks for stopping by the "Rocket Ranch."

861
00:57:24,560 --> 00:57:29,210
And special thanks to our guests, Bob Sieck,
Melissa Jones, and Milt Heflin.

862
00:57:29,210 --> 00:57:34,040
To learn more about the Apollo 50th Anniversary
activities, visit nasa.gov.

863
00:57:34,040 --> 00:57:39,260
For more on Orion Underway Recovery, visit
nasa.gov/egs.

864
00:57:39,260 --> 00:57:43,830
For all things Orion, visit nasa.gov/orion.

865
00:57:43,830 --> 00:57:50,070

And to learn more about everything going on
at the Kennedy Space Center, go to nasa.gov/kennedy.

866
00:57:50,070 --> 00:57:54,480
Special shout-out to our producer, John Sackman,
our soundmen, Lorne Mathre and Michelle Stone,

867
00:57:54,480 --> 00:57:58,810
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