
PAO
NASA

1
00:00:00,816 --> 00:00:01,316
>> Hi, everybody.

2
00:00:01,316 --> 00:00:03,306
Josh Byerly here inside
Mission Control, Houston.

3
00:00:03,306 --> 00:00:05,326
I want to welcome Milt
Heflin, former Flight Director,

4
00:00:05,386 --> 00:00:06,866
former Leader of the
Johnson Space Center.

5
00:00:06,866 --> 00:00:08,376
He is coming back
to visit us today.

6
00:00:08,376 --> 00:00:11,326
It's been 20 years since a
pretty important mission,

7
00:00:11,326 --> 00:00:12,296
STS-61.

8
00:00:12,296 --> 00:00:13,756
Which was the first
servicing mission

9
00:00:13,756 --> 00:00:14,916
to the Hubble Space Telescope.

10
00:00:14,916 --> 00:00:16,456
Let's set the stage
here real quick.

11
00:00:16,456 --> 00:00:18,196
Hubble was launched

back in 1990.

12
00:00:18,566 --> 00:00:20,826
And then once the pictures
started coming down they noticed

13
00:00:20,826 --> 00:00:21,616
that there was something wrong.

14
00:00:21,616 --> 00:00:24,096
It was a little bit blurry
and the images were not nearly

15
00:00:24,096 --> 00:00:26,576
as sharp as what they
expected it to be.

16
00:00:26,576 --> 00:00:27,666
There was a problem
with the mirror.

17
00:00:27,726 --> 00:00:28,036
Right?

18
00:00:28,126 --> 00:00:28,566
>> Correct.

19
00:00:28,566 --> 00:00:29,136
Absolutely.

20
00:00:29,256 --> 00:00:30,066
>> So then what happened?

21
00:00:30,706 --> 00:00:32,816
>> Well, how are
we going to fix it?

22
00:00:32,816 --> 00:00:32,886
>> Yeah.

23
00:00:33,046 --> 00:00:34,866
>> You know we got
to figure that out.

24
00:00:35,226 --> 00:00:36,766
Which I think we're
really good at.

25
00:00:37,166 --> 00:00:37,306
>> Yeah.

26
00:00:37,376 --> 00:00:38,016
>> Which we've proved.

27
00:00:38,016 --> 00:00:42,456
If you think back to that
time, we were in a situation

28
00:00:42,456 --> 00:00:44,156
where there were a number
of things going on that kind

29
00:00:44,156 --> 00:00:47,276
of put NASA in a -- kind of
in the doghouse a little bit.

30
00:00:47,336 --> 00:00:47,546
>> Yeah.

31
00:00:47,806 --> 00:00:50,136
>> We had lost Mars
Observer when it got close

32
00:00:50,136 --> 00:00:52,866
to getting in orbit around Mars.

33
00:00:53,096 --> 00:00:54,956
We were going through

it suffering some

34
00:00:54,956 --> 00:00:57,396
of the hydrogen fuel
leaks on shuttle.

35
00:00:57,726 --> 00:00:59,196
Grounding the fleet temporarily.

36
00:00:59,196 --> 00:00:59,316
>> Yeah.

37
00:00:59,316 --> 00:01:06,046
>> And so it was, you know, what
have you done for me lately?

38
00:01:06,046 --> 00:01:08,596
And so from a congressional

39
00:01:08,596 --> 00:01:10,736
and a budget standpoint
there was a lot of pressure.

40
00:01:10,996 --> 00:01:11,226
>> Yeah.

41
00:01:11,336 --> 00:01:13,086
>> And I showed up
in my office one day.

42
00:01:13,636 --> 00:01:15,636
I actually got -- I'm
not going to read this.

43
00:01:15,666 --> 00:01:18,516
But here's the actual piece of
paper that I got which is a page

44
00:01:18,516 --> 00:01:19,826

out of the Congressional Record.

45
00:01:19,826 --> 00:01:20,076
>> Mm-hm.

46
00:01:20,536 --> 00:01:21,816
>> And I don't know
who put it there.

47
00:01:21,946 --> 00:01:23,286
I still don't know
who put it there.

48
00:01:23,486 --> 00:01:24,586
But there's a paragraph in there

49
00:01:24,586 --> 00:01:27,666
that says NASA you've got
basically one more chance.

50
00:01:27,666 --> 00:01:27,876
>> Yeah.

51
00:01:28,066 --> 00:01:29,196
>> With what's been going on.

52
00:01:29,196 --> 00:01:33,586
And so that painted a picture
where we were starting at.

53
00:01:33,706 --> 00:01:35,516
A lot of pressure to
get it done right.

54
00:01:35,756 --> 00:01:37,076
>> So you launch this mission

55
00:01:37,076 --> 00:01:38,866
and there was back-to-back

spacewalks

56
00:01:38,866 --> 00:01:39,806
to go there and fix Hubble.

57
00:01:39,916 --> 00:01:42,226
Talk about, you know, what
was the biggest pressure.

58
00:01:42,226 --> 00:01:45,096
When did you know that, okay,
this is going to be a success.

59
00:01:45,096 --> 00:01:46,156
Or what were you afraid of?

60
00:01:46,156 --> 00:01:48,136
Like, what was the sort of the
thing that kept you up at night?

61
00:01:48,136 --> 00:01:50,336
>> I think where it
hit me was probably

62
00:01:50,856 --> 00:01:52,906
after our 14th independent
review.

63
00:01:52,906 --> 00:01:53,656
>> [laughter]

64
00:01:53,656 --> 00:01:54,456
>> That we had.

65
00:01:54,946 --> 00:01:58,896
Because I was convinced --
good people by the way too --

66
00:01:58,956 --> 00:01:59,876

they wanted to help us.

67
00:01:59,956 --> 00:02:02,646
And towards the end
of this it was

68
00:02:02,646 --> 00:02:05,726
like they can't ask
any more questions.

69
00:02:05,956 --> 00:02:06,746
I mean we're there.

70
00:02:06,746 --> 00:02:07,656
We're prepared.

71
00:02:07,726 --> 00:02:09,376
And in fact, I'll
be honest with you.

72
00:02:09,376 --> 00:02:11,886
I went into the mission
extremely cocky

73
00:02:12,166 --> 00:02:14,146
because I was convinced
this team could do it.

74
00:02:14,146 --> 00:02:14,213
>> Yeah.

75
00:02:14,213 --> 00:02:17,426
>> And to sit in Mission
Control and watch it advance

76
00:02:17,426 --> 00:02:21,846
to where each day more
smiles came up on the faces

77

00:02:21,846 --> 00:02:22,816
of the flight controllers.

78
00:02:22,816 --> 00:02:22,886
>> Yeah.

79
00:02:22,886 --> 00:02:25,186
>> And people involved
including the Goddard team.

80
00:02:25,686 --> 00:02:26,976
And it was just great
to see that.

81
00:02:27,186 --> 00:02:29,096
>> Yeah. And we just saw the
shot of you back, I guess,

82
00:02:29,186 --> 00:02:30,626
20 years ago running
that mission.

83
00:02:30,626 --> 00:02:31,986
That was actually
in this very room.

84
00:02:31,986 --> 00:02:32,116
>> Yes.

85
00:02:32,116 --> 00:02:33,066
>> It looks a little
bit different now.

86
00:02:33,066 --> 00:02:35,316
We kind of modernized it
a little bit, but it's.

87
00:02:35,316 --> 00:02:36,956
>> Yeah. And my hair
is a different color

88
00:02:36,956 --> 00:02:38,296
than it was back
then too [laughter].

89
00:02:38,506 --> 00:02:39,536
>> So when did you know.

90
00:02:39,536 --> 00:02:40,546
Like, during the
mission, you know,

91
00:02:40,546 --> 00:02:41,756
we do these back-to-back
spacewalks.

92
00:02:41,756 --> 00:02:43,316
When did you know,
okay, we've done it?

93
00:02:43,316 --> 00:02:45,316
It's going to be a success.

94
00:02:45,316 --> 00:02:47,126
Was it at the end of it
or was it a [inaudible].

95
00:02:47,126 --> 00:02:49,616
>> Well. Great question
because the very first spacewalk

96
00:02:49,616 --> 00:02:52,516
that we did we had trouble
closing some access doors

97
00:02:52,516 --> 00:02:53,036
on the.

98
00:02:53,836 --> 00:02:54,006

>> Yeah.

99
00:02:54,006 --> 00:02:57,056
>> And I went into this
mission wanting to do one thing

100
00:02:57,056 --> 00:02:59,226
and that was to keep a beat.

101
00:02:59,226 --> 00:03:02,256
I wanted to get things done
when we said we were going

102
00:03:02,256 --> 00:03:04,026
to get them done
and not get behind.

103
00:03:04,696 --> 00:03:06,996
And that very first spacewalk
where we had a problem.

104
00:03:07,786 --> 00:03:09,916
It was, oh boy, I
don't want this.

105
00:03:09,916 --> 00:03:13,076
We got to get that done today
and not worry about it later.

106
00:03:13,076 --> 00:03:13,636
Which we did.

107
00:03:14,376 --> 00:03:16,236
That caused me and the team --

108
00:03:16,236 --> 00:03:17,646
I think when we left
mission control

109

00:03:17,646 --> 00:03:19,066
after that very first spacewalk.

110
00:03:19,066 --> 00:03:21,566
I think that caused us to
think, oh, that's great.

111
00:03:21,656 --> 00:03:24,776
We are only one EVA,
we got four more to do.

112
00:03:25,096 --> 00:03:25,163
>> Yeah.

113
00:03:25,163 --> 00:03:28,696
>> But by golly we solved a
significant problem in time.

114
00:03:29,156 --> 00:03:31,956
And as the next EVA occurred

115
00:03:31,956 --> 00:03:33,566
where we had a solar
ray problem.

116
00:03:33,566 --> 00:03:34,676
And we decided that
we were going

117
00:03:34,676 --> 00:03:36,506
to throw the solar
ray by Mission rules.

118
00:03:36,506 --> 00:03:37,596
Well typically you talk

119
00:03:37,596 --> 00:03:39,466
about that even though
you decided you were going

120
00:03:39,466 --> 00:03:39,796
to do that.

121
00:03:39,796 --> 00:03:39,926
>> Right.

122
00:03:40,146 --> 00:03:41,186
>> We didn't talk about it.

123
00:03:41,416 --> 00:03:42,156
We just did it.

124
00:03:42,156 --> 00:03:42,406
>> You did it.

125
00:03:42,406 --> 00:03:43,966
>> Because we -- and
to stay on schedule.

126
00:03:44,076 --> 00:03:44,856
To get it all done.

127
00:03:45,536 --> 00:03:47,916
>> Talk about just the task of
having to do back-to-back EVAs.

128
00:03:47,916 --> 00:03:49,916
And that we typically don't
do that except for Hubble.

129
00:03:49,916 --> 00:03:51,146
You know, we had
basically -- what was it --

130
00:03:51,146 --> 00:03:51,706
five back-to-back EVAs?

131
00:03:51,706 --> 00:03:52,636

>> We had five back-to-back.

132
00:03:52,636 --> 00:03:52,766
>> Yeah.

133
00:03:52,766 --> 00:03:54,646
>> In fact, when the mission
started I think there were,

134
00:03:54,646 --> 00:03:55,636
like, two on the books.

135
00:03:55,636 --> 00:03:56,936
And then we went to three.

136
00:03:56,936 --> 00:04:00,416
And then we decided we had to do
another and another, so forth.

137
00:04:00,416 --> 00:04:03,046
Well that was pretty
stressful to take the team

138
00:04:03,046 --> 00:04:06,316
and go through and do that.

139
00:04:07,296 --> 00:04:10,546
But you know that -- the
thing that really did looking

140
00:04:10,546 --> 00:04:12,676
at Space Station
was it did prove

141
00:04:13,226 --> 00:04:15,476
that we can do what we
say we're going to do.

142
00:04:15,476 --> 00:04:17,186

We can do these things
back to back.

143
00:04:17,666 --> 00:04:20,106
I like what Covey said at
the end of the mission.

144
00:04:20,106 --> 00:04:20,173
He --

145
00:04:20,173 --> 00:04:20,416
>> Dick Covey.

146
00:04:20,416 --> 00:04:22,506
>> He basically -- Dick
Covey, the commander.

147
00:04:22,506 --> 00:04:24,326
Basically after the landing back

148
00:04:24,326 --> 00:04:26,576
at Ellington he said
we were successful

149
00:04:26,576 --> 00:04:27,846
because we had good equipment.

150
00:04:28,346 --> 00:04:29,086
We had good people.

151
00:04:29,446 --> 00:04:30,456
We had good preparation.

152
00:04:30,616 --> 00:04:32,936
>> Yeah. You mention
Space Station.

153
00:04:32,936 --> 00:04:34,196
Let's talk about some

of the lessons learned.

154
00:04:34,196 --> 00:04:36,236
You know, do you think, and
we talked about this before.

155
00:04:36,236 --> 00:04:39,536
But do you think that,
you know, people looked

156
00:04:39,536 --> 00:04:41,156
at designing Space Station and
building it and they're, like,

157
00:04:41,156 --> 00:04:43,216
wow, this is going to
take so many spacewalks.

158
00:04:43,356 --> 00:04:45,616
And it's going to
take so much time.

159
00:04:45,616 --> 00:04:47,566
Do you think the learning
curve is a little bit less

160
00:04:47,566 --> 00:04:49,616
with Space Station because
of these Hubble missions?

161
00:04:49,616 --> 00:04:50,836
>> Oh absolutely.

162
00:04:51,056 --> 00:04:52,876
Oh no, absolutely.

163
00:04:53,416 --> 00:04:57,136
We were able to -- put
it to you this way --

164
00:04:57,136 --> 00:05:02,626
the things on Hubble that were
built to be spacewalk friendly.

165
00:05:02,626 --> 00:05:02,946
>> Mm-hm.

166
00:05:03,586 --> 00:05:04,516
>> Worked great.

167
00:05:04,946 --> 00:05:08,306
Some of the things that we
added to the mission which due

168
00:05:08,376 --> 00:05:13,306
to budget cuts Hubble folks
weren't able to have them

169
00:05:13,306 --> 00:05:14,566
in a position like that.

170
00:05:14,566 --> 00:05:17,366
So we had to sort of
design it on the fly

171
00:05:17,366 --> 00:05:18,426
or prior to the mission.

172
00:05:19,146 --> 00:05:21,136
We got those done but
they took longer time.

173
00:05:21,316 --> 00:05:21,516
>> Yeah.

174
00:05:21,516 --> 00:05:22,446
>> And so that said,
if you're going

175
00:05:22,446 --> 00:05:24,246
to go build a station build it

176
00:05:24,246 --> 00:05:26,886
so that spacewalkers
can assemble it.

177
00:05:26,916 --> 00:05:27,136
>> Yeah.

178
00:05:27,186 --> 00:05:28,066
>> And that's what we did.

179
00:05:28,066 --> 00:05:29,446
>> Yeah. And it worked out.

180
00:05:29,446 --> 00:05:30,526
>> It worked out great.

181
00:05:30,876 --> 00:05:31,766
>> So last question for you.

182
00:05:31,766 --> 00:05:34,796
Do you-- when you take a look
at just how much Hubble has sort

183
00:05:34,796 --> 00:05:36,486
of become such an iconic thing.

184
00:05:36,486 --> 00:05:38,266
It's in, I mean, people use
the pictures from Hubble

185
00:05:38,266 --> 00:05:39,876
as there wallpapers on
their computers and stuff.

186
00:05:39,876 --> 00:05:40,076

>> Yeah.

187
00:05:40,076 --> 00:05:41,946
>> Do you look back and go wow,
you know, I was a part of that.

188
00:05:41,946 --> 00:05:45,496
I mean, does it still
even 20 years later?

189
00:05:45,496 --> 00:05:47,206
>> Yes. On chances I go out

190
00:05:47,206 --> 00:05:49,966
and speak occasionally people
always ask me well do I think

191
00:05:49,966 --> 00:05:54,226
there's other intelligent life
in the cosmos or whatever.

192
00:05:54,226 --> 00:05:54,336
>> Right.

193
00:05:54,336 --> 00:05:55,556
>> And I tell -- you
gotta be kidding me.

194
00:05:55,556 --> 00:05:58,196
I said that the very first time
we saw this picture from Hubble,

195
00:05:58,236 --> 00:06:01,456
which was a point in
the sky where the handle

196
00:06:01,456 --> 00:06:03,936
and the Big Dipper came
together, you know.

197
00:06:03,936 --> 00:06:07,406
Very very small point and Hubble
showed this deep field view.

198
00:06:07,466 --> 00:06:07,656
>> Yeah.

199
00:06:07,656 --> 00:06:09,576
>> With thousands of galaxies.

200
00:06:09,996 --> 00:06:11,456
And we live in a galaxy.

201
00:06:11,456 --> 00:06:12,846
We are a solar system
in a galaxy.

202
00:06:12,846 --> 00:06:14,296
And you're telling me
that's all that's there.

203
00:06:14,296 --> 00:06:14,386
>> Mm-hm.

204
00:06:14,386 --> 00:06:15,496
>> You've got to be kidding me.

205
00:06:15,496 --> 00:06:15,686
>> Yeah.

206
00:06:16,006 --> 00:06:18,166
>> And that's what I
think about when I think

207
00:06:18,166 --> 00:06:19,136
about what we did to Hubble.

208
00:06:19,506 --> 00:06:21,296

>> Milt Heflin, former Flight Director, former Leader

209
00:06:21,296 --> 00:06:22,236
of the Johnson Space Center,

210
00:06:22,306 --> 00:06:24,836
key part of the STS-61 mission 20 years ago today.

211
00:06:24,836 --> 00:06:24,946
>> Yes.

212
00:06:24,946 --> 00:06:26,696
>> That's when it launched and it went up there

213
00:06:26,696 --> 00:06:27,816
and helped us fix Hubble.

214
00:06:27,816 --> 00:06:29,256
Probably one of the highest profile missions

215
00:06:29,256 --> 00:06:30,936
since the space shuttle ever flew.

216
00:06:31,176 --> 00:06:33,536
>> Well, Josh, I thank you for inviting me back

217
00:06:33,536 --> 00:06:36,296
to my favorite building and all of human spaceflight.

218
00:06:36,296 --> 00:06:37,146
>> Yeah. It never gets old does it?

219
00:06:37,146 --> 00:06:38,126
>> It does not.

220
00:06:38,416 --> 00:06:38,926
>> Thanks a lot, Milt.

221
00:06:38,926 --> 00:06:39,416
I appreciate it.