

HUBBLE MEMORABLE MOMENTS



1
00:00:00,010 --> 00:00:04,180
[no sound]

2
00:00:04,200 --> 00:00:08,360
>>KATRINA: NASA Goddard's Space Telescope Operations Control Center

3
00:00:08,380 --> 00:00:12,720
has seen a lot of activity over the past 25 years of the Hubble Space Telescope.

4
00:00:12,740 --> 00:00:16,900
It looks calm now, but 13 years ago, it was a

5
00:00:16,920 --> 00:00:21,010
very different story. [tense music]

6
00:00:21,030 --> 00:00:25,090
[music] >>JOHN: Engineers at the Goddard

7
00:00:25,110 --> 00:00:29,260
Space Flight Center discovered that there was a very small fault

8
00:00:29,280 --> 00:00:33,440
in the Power Control Unit. >>CHRISTINE: You know, it's the heart of Hubble. All the power

9
00:00:33,460 --> 00:00:37,640
runs through that box. >>MIKE: To change out the PCU, you actually have to turn off the

10
00:00:37,660 --> 00:00:41,820
telescope. This is something we've never ever done, is turn the telescope completely

11
00:00:41,840 --> 00:00:45,890
off. >>JOHN: When we turn all the power off of Hubble, it starts

12
00:00:45,910 --> 00:00:50,060
getting cold. >>AL: You know, space is a cruel environment, and so

13
00:00:50,080 --> 00:00:54,240

the temperature control of the telescope is very important. >>MIKE: I was brought on

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00:00:54,260 --> 00:00:58,420

to develop a command procedure which we called the super proc, which would turn the telescope off

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00:00:58,440 --> 00:01:02,610

as quickly as we possibly could. >>CHRISTINE: For months, we analyzed different scenarios.

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00:01:02,630 --> 00:01:06,650

>>ART: We thought through everything that could possibly go wrong.

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00:01:06,670 --> 00:01:10,690

>>CHRISTINE: We felt confident, we had a ream of analysis. [electronic beeps]

18

00:01:10,710 --> 00:01:14,880

>>MIKE: I arrived late at night for the start of the orbit

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00:01:14,900 --> 00:01:19,050

shift. >>AL: So the team was very prepared and very focused on what we had

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00:01:19,070 --> 00:01:23,240

to do that night. >>CHRISTINE: You know everything was pretty calm, everything was,

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00:01:23,260 --> 00:01:27,410

you know, you're nervous, but everything was going according to plan. >>MIKE: John was getting into

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00:01:27,430 --> 00:01:31,600

his suit, he's getting into the airlock, they're going through all their checklists, and we're sending commands

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00:01:31,620 --> 00:01:35,640

and commands. It's like we were starting down a roller coaster ride. >>ART: The goal was

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00:01:35,660 --> 00:01:39,810

always to have the work site ready to go with whatever power needed to be

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00:01:39,830 --> 00:01:44,010

removed for safety considerations, just when the crew got to the work

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00:01:44,030 --> 00:01:48,190

site. [electronic beeps] >>MIKE: All of a sudden, we hear,

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00:01:48,210 --> 00:01:52,360

over the loops we hear John say, "I have a leak." >>CHRISTINE: What does that mean?!

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00:01:52,380 --> 00:01:56,560

A water leak in a suit, you know that's, that's not good.

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00:01:56,580 --> 00:02:00,620

>>MIKE: Then Al comes on the loops and tells us, "Stop doing the commanding.

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00:02:00,640 --> 00:02:04,820

We need to figure out what we're going to do from this point." >>AL: What we immediately did was

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00:02:04,840 --> 00:02:09,020

started to assess what components we had already powered off.

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00:02:09,040 --> 00:02:13,200

>>CHRISTINE: Then I said, "You know, these things don't have a large margin, you know we're

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00:02:13,220 --> 00:02:17,400

up to the line." >>AL: Our thermal engineers would tell us, "Well given the condition

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00:02:17,420 --> 00:02:21,420

and the current temperatures, we've got a certain amount of time."

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00:02:21,440 --> 00:02:25,450

>>CHRISTINE: I said, "Okay, turn on this, turn on these, you know, general bus

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00:02:25,470 --> 00:02:29,630

heaters." >>MIKE: At the same time, the astronauts are frantically working to change out

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00:02:29,650 --> 00:02:33,820

John's suit to get him back ready. >>ART: The next thing we hear is, "Okay,

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00:02:33,840 --> 00:02:37,990

we've got it fixed." >>CHRISTINE: You know, he got into a different suit, and things were

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00:02:38,010 --> 00:02:42,170

working well. We turned right back around and starting shutting things back off. >>ART: And so

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00:02:42,190 --> 00:02:46,280

we were right back on that roller coaster of powering down again. >>CHRISTINE: It was a relief to me, we're

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00:02:46,300 --> 00:02:50,310

back on track, you know we're back to the original plan. >>MIKE: Luckily we had everything

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00:02:50,330 --> 00:02:54,500

reconfigured in time, so that by the time John got to the door

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00:02:54,520 --> 00:02:58,870

and was ready to start working on the PCU, we were able to send the super proc.

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00:02:58,890 --> 00:03:03,050

>>VOICE OVER HEADSET: The telescope is powered down. John, tell those

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00:03:03,070 --> 00:03:07,230

super proc people they're geniuses.

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00:03:07,250 --> 00:03:11,420

>>MIKE: The telescope was completely off.

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00:03:11,440 --> 00:03:15,460

>>CHRISTINE: It's an engineer's life blood to sit there and watch the telemetry, watch the temperatures, watch

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00:03:15,480 --> 00:03:19,630

the voltages, watch the power, make sure everything is safe while they're working on the telescope.

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00:03:19,650 --> 00:03:23,830

But we had none of that. >>MIKE: All we could do was sit back and watch John perform what was

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00:03:23,850 --> 00:03:28,020

one of the most amazing EVAs of all times, it was like watching poetry in motion.

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00:03:36,390 --> 00:03:32,200

[quiet driving music]

52

00:03:36,410 --> 00:03:40,400

[music fades out] [electronic beeps] >>ART: Before we knew it,

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00:03:40,420 --> 00:03:44,590

it was time to power things back on. >>MIKE: They gave us the call

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00:03:44,610 --> 00:03:48,760

down to say, "Go for the PCU aliveness test." This is where we actually

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00:03:48,780 --> 00:03:52,950

can send the commands to turn the telescope back on.

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00:03:52,970 --> 00:03:57,110

>>ART: All of a sudden, this flood of telemetry starts

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00:03:57,130 --> 00:04:01,210

coming in from the telescope. >>CHRISTINE: Power was running through it, the batteries were

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00:04:01,230 --> 00:04:05,400

charging, and for me the temperatures were

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00:04:05,420 --> 00:04:09,580

looking in a safe, you know, range. >>ART: Everyone's looking at their screens and

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00:04:09,600 --> 00:04:13,750

it was pretty much just green across the board. >>MIKE: Hubble was back alive.

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00:04:13,770 --> 00:04:17,930

>>AL: We were very pleased, of course. >>CHRISTINE: It was a lot of work, it was years of work, so

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00:04:17,950 --> 00:04:22,110

it wasn't wasted, everything worked out according to plan. >>MIKE: Hubble

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00:04:22,130 --> 00:04:26,230

is a great project with amazing people, and we were able to prove it that day.

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00:04:26,250 --> 00:04:30,410

[music]

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00:04:30,430 --> 00:04:34,590

>>KATRINA: The Hubble Space Telescope is one of the most important scientific instruments

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00:04:34,610 --> 00:04:38,760

in all of human history, so to think about possibly messing something up

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00:04:38,780 --> 00:04:42,950

on the telescope is terrifying. This was not the first or last time

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00:04:42,970 --> 00:04:47,120

that NASA's Goddard Space Flight Center took action to keep Hubble up and running.

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00:04:47,140 --> 00:04:51,210

So stay tuned for more memorable moments from Hubble's 25 years.