
PAO
POSN 4732

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00:00:01,396 --> 00:00:03,456
>> Pat Ryan: Joining me this
morning is Angela Bauer,

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00:00:03,716 --> 00:00:07,376
who is the lead of the Facilities
Operations and Maintenance Group

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00:00:07,376 --> 00:00:09,126
in the Missions Operation Directorate.

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00:00:09,426 --> 00:00:12,746
Angela, when you tell somebody what
it is that you do for a living,

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00:00:12,746 --> 00:00:14,796
how do you explain what that job is?

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00:00:15,256 --> 00:00:18,716
>> Angela Bauer: Well, if that person doesn't
work here at NASA, the way I explain it is

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00:00:18,716 --> 00:00:21,596
that everything that you see
when you look at this room

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00:00:21,596 --> 00:00:23,886
on television is something
that my group controls.

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00:00:24,016 --> 00:00:29,436
So we control, or we take things as mundane
as the carpet and the pink color on the walls,

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00:00:29,536 --> 00:00:33,336
but we also take care of the very
important things, such as the workstations

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00:00:33,336 --> 00:00:35,606

and the consoles that the
flight controllers sit at.

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00:00:36,126 --> 00:00:40,496
We control the data that flows here from
spacecraft through ground station to here.

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00:00:40,986 --> 00:00:43,136
We take care of the processing
that happens to that data.

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00:00:43,306 --> 00:00:46,766
We make sure that that data gets down to the
flight controller so that they can see it

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00:00:47,156 --> 00:00:49,656
and view it and look for
troubleshooting and do their jobs.

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00:00:50,866 --> 00:00:55,076
>> Pat Ryan: And yet your work is not
restricted to just this room in this building?

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00:00:55,506 --> 00:00:58,516
>> Angela Bauer: No, we take care of this
entire building, which includes this room.

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00:00:58,516 --> 00:01:02,246
We actually right now have four flight
control rooms, so we have this room,

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00:01:02,246 --> 00:01:06,616
we still have the White Flight Control
room, which was used for the Shuttle,

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00:01:07,146 --> 00:01:11,086
and now it is sitting waiting
for the next opportunity

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00:01:11,086 --> 00:01:14,286

which will be actually the
Orion Exploration Flight 1,

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00:01:14,286 --> 00:01:16,796
which will happen in 2014,
we're going to use that room.

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00:01:17,286 --> 00:01:20,446
We also have a Blue Flight Control
Room and a Red flight control room.

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00:01:20,556 --> 00:01:23,116
Those are mainly used for tests
and simulations right now.

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00:01:23,776 --> 00:01:26,646
And in addition to that we also have
server rooms throughout the building.

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00:01:26,646 --> 00:01:29,696
We have rooms where the data comes in.

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00:01:29,696 --> 00:01:35,556
We have a lot of equipment that handles all
of the voice, all of the key sets and headsets

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00:01:35,556 --> 00:01:38,456
that the flight controllers use
to communicate back and forth.

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00:01:38,506 --> 00:01:41,696
We also have a lot of equipment
that does the video,

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00:01:41,696 --> 00:01:45,806
such as the video you're watching right now, the
video that you can see on the screens behind us.

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00:01:46,196 --> 00:01:48,616
>> Pat Ryan: On a day-to-day

basis, on a routine basis,

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00:01:48,666 --> 00:01:52,496
what sort of support are your
folks called upon to provide?

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00:01:53,116 --> 00:01:54,226
>> Angela Bauer: Oh, we do everything.

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00:01:55,226 --> 00:01:58,116
Daily we take care of a lot
of things called anomalies

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00:01:58,206 --> 00:02:00,536
that the flight controllers
and other people report.

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00:02:00,536 --> 00:02:01,286
>> Pat Ryan: They don't sound good.

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00:02:02,356 --> 00:02:04,146
>> Angela Bauer: No, but
sometimes they're not bad.

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00:02:04,536 --> 00:02:09,936
Sometimes they're anomalies that a workstation
monitor isn't working or a unit that we use

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00:02:09,936 --> 00:02:13,766
to communicate for the voice isn't
working, and those are pretty easy to fix.

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00:02:13,816 --> 00:02:15,526
Sometimes they're a little bit more complicated.

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00:02:15,526 --> 00:02:18,386
When you have a flight controller
attempt to send a command

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00:02:18,386 --> 00:02:22,506
and the command doesn't leave the building,
then that takes a lot more trouble-shooting,

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00:02:22,506 --> 00:02:25,976
to go figure out you've got to get into
the computer code and start to find

44
00:02:25,976 --> 00:02:27,226
out what happened and what went wrong.

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00:02:28,046 --> 00:02:31,656
>> Pat Ryan: Those sorts of things, are
those routine, those kind of problems?

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00:02:32,326 --> 00:02:34,716
>> Angela Bauer: Problems with the
Command system are not very routine.

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00:02:34,716 --> 00:02:39,426
The Command system has been in place for
-- it was initiated about 15 years ago,

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00:02:39,516 --> 00:02:43,696
so our homegrown Command system
is actually pretty robust,

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00:02:43,696 --> 00:02:45,576
and we don't have a lot of
problems with it these days.

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00:02:46,406 --> 00:02:51,346
>> Pat Ryan: In a dynamic environment like
that, where you've got a spaceship in orbit

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00:02:51,376 --> 00:02:56,226
with a crew, those kind of things,
there must be some more unusual calls

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00:02:56,226 --> 00:02:58,566

for support that your folks get.

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00:02:58,626 --> 00:03:03,256
Can you give us a couple of examples
of the non-routine things that happen?

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00:03:03,816 --> 00:03:06,476
>> Angela Bauer: Well, on a
large scale I'd say probably some

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00:03:06,476 --> 00:03:12,596
of the most unusual requests we've gotten in the
past couple of years have had to do with the way

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00:03:12,596 --> 00:03:14,146
that technology has changed so much.

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00:03:14,566 --> 00:03:18,496
And so we've had to figure out ways that we
could have the astronauts do things such as post

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00:03:18,496 --> 00:03:22,646
to Twitter, and surf the Internet and get
their e-mail while they're up on orbit.

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00:03:23,076 --> 00:03:26,726
And those are things that were never really
considered when the Control Center was built

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00:03:26,726 --> 00:03:30,986
in the first place, so we've had to come up with
some innovative ideas and ways to allow them

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00:03:30,986 --> 00:03:34,496
to do that but still have it be safe so
that we can't compromise the Space Station.

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00:03:34,496 --> 00:03:37,196
>> Pat Ryan: So that the
commanding and the other things

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00:03:37,196 --> 00:03:40,316
that it was built to do, will still do.

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00:03:40,466 --> 00:03:40,716
>> Angela Bauer: Right.

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00:03:41,306 --> 00:03:47,146
>> Pat Ryan: We're referred to the fact over
the years that this room is in the same building

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00:03:47,146 --> 00:03:51,116
as the Space Shuttle Flight Control
Room, and you pointed out that of course,

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00:03:51,116 --> 00:03:53,546
that's not used for Space
Shuttle commanding anymore.

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00:03:53,856 --> 00:03:56,756
Talk more about what it is
being used for right now.

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00:03:56,756 --> 00:04:01,826
What have your folks had to do in that
room to get it ready for its next act?

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00:04:02,476 --> 00:04:06,566
>> Angela Bauer: Well, actually, the Orion
Exploration Flight Test 1, which is scheduled

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00:04:06,566 --> 00:04:11,086
for '14, is planning to use a lot of the
same equipment that we have in here today,

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00:04:11,086 --> 00:04:13,796
so there's not a whole lot of
extra effort that we have to do

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00:04:13,796 --> 00:04:15,656
to make it capable supporting that flight.

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00:04:15,766 --> 00:04:26,206
So that test is actually going to use the
same workstations that we've installed.

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00:04:26,206 --> 00:04:27,506
Our workstations are very flexible.

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00:04:27,506 --> 00:04:31,366
We try to make sure that everything that we
do is something that we can use in the future,

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00:04:31,486 --> 00:04:36,036
so our workstations can be loaded with
whatever operating system we need.

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00:04:36,346 --> 00:04:41,356
So it's going to be used for tests
and observations for that Mission.

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00:04:41,356 --> 00:04:43,206
Until then we also use it to support some

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00:04:43,206 --> 00:04:45,696
of the other activities we
have going on in the building.

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00:04:46,006 --> 00:04:48,776
>> Pat Ryan: Such as training
of flight controllers?

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00:04:48,846 --> 00:04:52,316
>> Angela Bauer: Training and tests
that we do with collaboration with some

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00:04:52,316 --> 00:04:54,286
of the other centers and international partners.

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00:04:54,286 --> 00:04:58,656
We support all of those kind of activities in
this building daily, and so we're always looking

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00:04:58,656 --> 00:05:02,206
for extra seats, because this room
obviously is used full-time for ISS.

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00:05:02,516 --> 00:05:05,716
>> Pat Ryan: Occasionally, the folks
in here do get moved to other rooms.

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00:05:05,716 --> 00:05:09,686
Are the other control rooms capable
of commanding the Space Station?

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00:05:09,686 --> 00:05:11,266
Can people work in there?

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00:05:11,266 --> 00:05:11,576
>> Angela Bauer: Yes.

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00:05:11,576 --> 00:05:15,666
You are able to send a command to the Space
Station from any workstation in this building.

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00:05:16,196 --> 00:05:21,736
That was one of the foundations that we had when
we designed the new building back in the '90s,

92
00:05:21,806 --> 00:05:24,086
was that we wanted the concept
of a roving flight controller,

93
00:05:24,156 --> 00:05:27,706
which means that we can put our flight
control team anywhere within this building

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00:05:27,706 --> 00:05:31,716

and they can get the same tools and have the
same capabilities that they would in this room.

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00:05:33,486 --> 00:05:37,786
>> Pat Ryan: Your group is responsible for
all of the control rooms and everything

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00:05:37,786 --> 00:05:42,556
in this building, as well as another
building, that is elsewhere at JSE --

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00:05:42,556 --> 00:05:47,036
the Jake Garn Simulator and
Training Facility, Building 5.

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00:05:47,316 --> 00:05:50,616
What sorts of things are you
folks supporting over there?

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00:05:50,616 --> 00:05:51,086
>> Angela Bauer: That's right.

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00:05:51,086 --> 00:05:55,136
A couple of years ago, we found some
efficiencies in combining the operations

101
00:05:55,136 --> 00:05:59,086
of this facility and the training
facility, and so our main capability

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00:05:59,086 --> 00:06:02,436
over there right now is the Space Station
Training Facility, where we have a mockup

103
00:06:02,436 --> 00:06:05,436
of the modules of the Space Station,
and all of them are functional.

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00:06:05,436 --> 00:06:08,526
We have computer models in there that

aren't exactly what you have on board,

105
00:06:08,936 --> 00:06:13,726
but are close enough that we can train
our flight controllers and our astronauts

106
00:06:13,796 --> 00:06:15,956
to identify and troubleshoot problems.

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00:06:15,956 --> 00:06:20,276
It also allows them to go through their standard
procedures and get adept at that as well.

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00:06:21,346 --> 00:06:23,586
And the other thing that we
have coming into Building 5 is

109
00:06:23,636 --> 00:06:25,596
that we're constantly looking forward.

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00:06:25,596 --> 00:06:30,406
We're trying to find the next innovative way
to make what we do here more cost effective.

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00:06:30,466 --> 00:06:37,116
And we have a project called Training Systems
21, TS-21, and they are looking at ways to have

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00:06:37,116 --> 00:06:39,456
that capability, not only for
the Space Station but also

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00:06:39,456 --> 00:06:41,286
for any other visiting vehicles
that we would have.

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00:06:41,286 --> 00:06:44,056
And so we have a lot of work
going on in that facility,

115
00:06:44,376 --> 00:06:48,246
building up for that future
implementation out in 2015.

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00:06:48,246 --> 00:06:51,836
>> Pat Ryan: I assume that you've also
been involved with the changeover,

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00:06:51,836 --> 00:06:54,716
because there were a lot of Space
Shuttle training facilities that were

118
00:06:54,716 --> 00:06:56,686
in that building until recently, too.

119
00:06:57,066 --> 00:06:57,426
>> Angela Bauer: That's right.

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00:06:57,426 --> 00:07:00,896
We call that Shuttle Transition
in Retirement, so Shuttle TNR,

121
00:07:00,946 --> 00:07:03,176
because we have to make everything
an acronym here.

122
00:07:03,176 --> 00:07:05,466
And we have a lot of work
going on in that building.

123
00:07:05,646 --> 00:07:11,606
The building at one time housed our motion
case, which is the simulator that actually moves

124
00:07:11,606 --> 00:07:15,616
and allows the flight controllers -- allows
the astronauts to get their training,

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00:07:15,616 --> 00:07:20,176

how to control the spacecraft, and we also
had a fixed based that was stationary,

126
00:07:20,586 --> 00:07:22,426
that allowed them to go and
work through their procedures.

127
00:07:22,836 --> 00:07:26,946
And so both of those are currently being
dismantled and prepared for shipment.

128
00:07:27,596 --> 00:07:31,246
>> Pat Ryan: It's building up new,
taking down old, all at the same time.

129
00:07:31,246 --> 00:07:32,226
>> Angela Bauer: That's right.

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00:07:32,306 --> 00:07:34,376
>> Pat Ryan: Tell me about
how you came into this job.

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00:07:34,376 --> 00:07:38,676
Have you been working NASA long,
or in Facilities Management?

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00:07:39,456 --> 00:07:42,016
>> Angela Bauer: Well, actually
I came to NASA in the year 2000,

133
00:07:42,016 --> 00:07:44,156
so I came from the petro chemical industry.

134
00:07:44,256 --> 00:07:47,866
That's not a standard career
path that most people take.

135
00:07:47,866 --> 00:07:49,296
A lot of people come straight out of college.

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00:07:49,296 --> 00:07:53,346
So I came here in 2000 and
I went into flight control.

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00:07:53,346 --> 00:07:56,216
I was a Shuttle electrical
power systems flight controller.

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00:07:56,286 --> 00:08:01,166
And then in 2003 I was given the opportunity
to move over to the Facilities Division,

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00:08:01,166 --> 00:08:06,006
which handles all of the infrastructure that you
see here, and I was actually the project manager

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00:08:06,266 --> 00:08:09,746
for the last update that we
do to all of the workstations.

141
00:08:09,746 --> 00:08:12,596
So I've been in Facilities since 2003.

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00:08:12,656 --> 00:08:14,926
>> Pat Ryan: Did you enjoy
being a flight controller?

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00:08:15,946 --> 00:08:17,196
>> Angela Bauer: It has its moments.

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00:08:18,926 --> 00:08:23,886
My husband is also a flight controller,
and at home we say flight control is hours

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00:08:23,886 --> 00:08:27,126
of sheer boredom followed
by moments of sheer terror.

146
00:08:27,656 --> 00:08:31,676

So there were some very exciting times
when I was a flight controller where we had

147
00:08:31,676 --> 00:08:35,546
to do trouble-shooting on the
station that I'll never forget.

148
00:08:35,736 --> 00:08:40,826
>> Pat Ryan: Yeah, things that specifically
you'd never train for, but that's the job.

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00:08:41,026 --> 00:08:41,256
>> Angela Bauer: Right.

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00:08:41,316 --> 00:08:46,096
>> Pat Ryan: Coming out of the petrochemical
industry, what was your education background?

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00:08:46,096 --> 00:08:49,616
what education gets you ready
for that job and this one, too?

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00:08:49,946 --> 00:08:54,206
>> Angela Bauer: Well, I'm actually a mechanical
engineer, so I did mechanical engineering

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00:08:54,206 --> 00:08:57,506
when I was in petrochem, and when I
came here I switched over to electrical,

154
00:08:57,786 --> 00:08:59,746
and then I've been doing computers ever since.

155
00:08:59,826 --> 00:09:03,146
So I think for flight control really
the important thing is that you have

156
00:09:03,146 --> 00:09:06,496
to have a degree in science and math, so
it doesn't matter what your degree is.

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00:09:06,726 --> 00:09:12,156
My fellow co-workers had physics degrees,
math degrees, all of the engineering degrees.

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00:09:12,666 --> 00:09:16,526
So it really just matters that you're into
science and you're a critical thinker.

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00:09:17,376 --> 00:09:20,016
>> Pat Ryan: Do you have the
excitement of space flight,

160
00:09:20,446 --> 00:09:23,326
being in charge of keeping the building running?

161
00:09:24,356 --> 00:09:26,136
>> Angela Bauer: It's very exciting.

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00:09:27,406 --> 00:09:30,826
You would thing that you'd be a bit removed
since we're not always sitting in this room,

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00:09:30,826 --> 00:09:35,466
except that within our group we do actually
have the ground controllers who sit in this room

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00:09:35,466 --> 00:09:39,746
in the back of the room, and they control all of
the ground assets, all of the communication gear

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00:09:39,746 --> 00:09:41,216
and they make sure that everything is working.

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00:09:41,726 --> 00:09:45,676
And so not only do we have their
involvement and their excitement, but also,

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00:09:45,886 --> 00:09:49,256

we have to work around the Mission whenever
we're making changes in the facility,

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00:09:49,256 --> 00:09:53,556
so we're constantly aware of what's going on
on orbit to make sure that we don't do anything

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00:09:53,556 --> 00:09:55,456
that could compromise any
sort of critical phase.

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00:09:56,216 --> 00:10:00,926
>> Pat Ryan: I appreciate the fact that all
this stuff works, and everyone else does, too.

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00:10:01,016 --> 00:10:01,366
Thank you.

172
00:10:01,676 --> 00:10:06,116
Angela Bauer is the lead of the
Facility Operations and Maintenance Group