



1
00:00:01,570 --> 00:00:03,140
>> There is another first

2
00:00:03,140 --> 00:00:05,880
for the International Space
Station coming up today.

3
00:00:05,880 --> 00:00:09,520
The next Progress vehicle
is due to not only launch

4
00:00:09,520 --> 00:00:12,490
from the Baikonur Cosmodrome
this afternoon but to dock

5
00:00:12,490 --> 00:00:14,600
to the International
Space Station tonight.

6
00:00:14,600 --> 00:00:18,140
It will be the first time that a
vehicle has launched and docked

7
00:00:18,140 --> 00:00:19,880
to the station at the same time.

8
00:00:19,880 --> 00:00:21,480
We're going to get
an update on --

9
00:00:21,480 --> 00:00:24,380
all of the preparations for
that and the reasons behind it

10
00:00:24,380 --> 00:00:27,810
on the Expedition 32 Lead
Flight Director Dina Contella.

11
00:00:27,810 --> 00:00:29,700

Dina, thanks for
taking a few minutes.

12

00:00:29,700 --> 00:00:33,750

Set the stage for us.

13

00:00:33,750 --> 00:00:37,500

All previous progresses in
Soyuz have taken about two days

14

00:00:37,500 --> 00:00:40,400

to get to the station.

15

00:00:40,400 --> 00:00:43,590

Presumably there's a very good
reason that they've done so.

16

00:00:43,590 --> 00:00:44,530

What is it?

17

00:00:44,530 --> 00:00:48,000

>> Well, there's
several good reasons.

18

00:00:48,000 --> 00:00:49,700

So the first is, it takes a --

19

00:00:49,700 --> 00:00:53,200

you have a lot longer time
between the launch and the time

20

00:00:53,200 --> 00:00:57,060

that you dock and so that adds a
lot of flexibility to the plan.

21

00:00:57,060 --> 00:01:02,930

For example if you had a booster
dispersion or you had some need

22

00:01:02,930 --> 00:01:05,970
to do more ground tracking
to narrow in on the Nav state

23

00:01:05,970 --> 00:01:08,870
or if you had a failure that
you wanted to analyze prior

24

00:01:08,870 --> 00:01:10,930
to the plan docking time.

25

00:01:10,930 --> 00:01:12,990
Then you would have
more time to do so.

26

00:01:12,990 --> 00:01:19,160
One of the major reasons
has to do with the location

27

00:01:19,160 --> 00:01:21,550
of ISS relative to
the launch site.

28

00:01:21,550 --> 00:01:24,740
In the case of a two day
rendezvous you have a lot longer

29

00:01:24,740 --> 00:01:28,360
time to basically
allow the vehicle --

30

00:01:28,360 --> 00:01:31,240
the two vehicles to meet up so
for the launch vehicle to catch

31

00:01:31,240 --> 00:01:34,510
up to the Space Station.

32

00:01:34,510 --> 00:01:39,730
If you try to hurry that scheme

then as ISS flies over it has

33

00:01:39,730 --> 00:01:42,940

to be in a very more
specific location relative

34

00:01:42,940 --> 00:01:46,400

to the launch location
and so that can help --

35

00:01:46,400 --> 00:01:49,410

that tends to narrow your
launch opportunity capability.

36

00:01:49,410 --> 00:01:54,000

So that's another reason why
four orbit scheme is a little

37

00:01:54,000 --> 00:01:55,600

bit more difficult.

38

00:01:55,600 --> 00:01:57,060

Four orbit being this you know,

39

00:01:57,060 --> 00:01:58,680

flight day one tend
to rendezvous.

40

00:01:58,680 --> 00:02:00,480

So and then, you know,

41

00:02:00,480 --> 00:02:04,270

additionally what
this does associated

42

00:02:04,270 --> 00:02:07,390

with the launch window
is it gives us fewer days

43

00:02:07,390 --> 00:02:11,650
that we can actually meet our
launch window, our opportunity.

44

00:02:11,650 --> 00:02:15,030
We try to make sure that
the orbital plane is aligned

45

00:02:15,030 --> 00:02:18,810
with the launch site and so we
already have that constraint

46

00:02:18,810 --> 00:02:22,720
and when you narrow this window
of opportunity where ISS is,

47

00:02:22,720 --> 00:02:26,100
you know, more directly above
the launch site then you end

48

00:02:26,100 --> 00:02:27,710
up with fewer days
that you can launch.

49

00:02:27,710 --> 00:02:30,990
So for example with the
34 Orbit longer scheme,

50

00:02:30,990 --> 00:02:33,600
this two day scheme you
can launch about two

51

00:02:33,600 --> 00:02:36,160
out of every three days
on a Soyuz, you know,

52

00:02:36,160 --> 00:02:38,230
that's when all the
parameters all line up.

53

00:02:38,230 --> 00:02:40,490

>> As you say, you had
more time after launch then

54

00:02:40,490 --> 00:02:44,150

to refine the approach to
make adjustments in order

55

00:02:44,150 --> 00:02:45,470

to bring the two
vehicles together.

56

00:02:45,470 --> 00:02:46,340

>> Well, that's true.

57

00:02:46,340 --> 00:02:48,490

That's true and also of
course, that, you know,

58

00:02:48,490 --> 00:02:50,930

it affects your opportunity
for launch.

59

00:02:50,930 --> 00:02:52,470

So you know, you can't
launch when ISS is

60

00:02:52,470 --> 00:02:53,910

on the other side of the world.

61

00:02:53,910 --> 00:02:54,960

They get more flexibility

62

00:02:54,960 --> 00:02:57,310

if you have a lot
longer rendezvous scheme

63

00:02:57,310 --> 00:02:58,670

versus if you have
a much shorter one.

64

00:02:58,670 --> 00:02:59,880

>> More time to make
up the difference.

65

00:02:59,880 --> 00:03:00,300

>> That's right.

66

00:03:00,300 --> 00:03:01,280

Exactly.

67

00:03:01,280 --> 00:03:04,280

>> What advantages then are --

68

00:03:04,280 --> 00:03:06,380

could be gained from
doing it this way

69

00:03:06,380 --> 00:03:07,990

and doing it on the same day?

70

00:03:07,990 --> 00:03:10,450

>> Well, so this is the
intended applicability for this.

71

00:03:10,450 --> 00:03:12,350

It's actually for the Soyuz
which is what, you know,

72

00:03:12,350 --> 00:03:15,150

we use to carry the --
to carry our crew members

73

00:03:15,150 --> 00:03:16,400

to the space station.

74

00:03:16,400 --> 00:03:19,240

And so there is a few advantages
from a human perspective.

75

00:03:19,240 --> 00:03:23,260

First of all, the Soyuz
vehicle, you know,

76

00:03:23,260 --> 00:03:25,900

if you get there faster, you
can imagine the crew discomfort

77

00:03:25,900 --> 00:03:28,940

being in a cramped vehicle,
and would be reduced.

78

00:03:28,940 --> 00:03:31,790

And also the vehicle
itself, it does a solar --

79

00:03:31,790 --> 00:03:34,550

it doesn't do a solar
spin attitude for part

80

00:03:34,550 --> 00:03:36,840

of it's trajectory on the
way to the Space Station

81

00:03:36,840 --> 00:03:41,740

so it has a very -- it has a
spin associated with it which,

82

00:03:41,740 --> 00:03:43,740

you know, is not
necessarily always noticeable

83

00:03:43,740 --> 00:03:46,610

but it could be, it could cause
more discomfort for the crew.

84

00:03:46,610 --> 00:03:48,520

>> I don't think most
people are aware of that.

85

00:03:48,520 --> 00:03:50,810

This is not a fast spin.

86

00:03:50,810 --> 00:03:51,720

>> No, no, it's not.

87

00:03:51,720 --> 00:03:54,600

It's just something that allows
for better pointing to the sun

88

00:03:54,600 --> 00:03:59,180

for power generation but it's
not like an extremely fast spin.

89

00:03:59,180 --> 00:04:02,140

It's just something that some
crew members have noticed

90

00:04:02,140 --> 00:04:04,520

in the past as something
that in this period

91

00:04:04,520 --> 00:04:07,420

of space adaptation right
after launch it would be better

92

00:04:07,420 --> 00:04:09,050

if they were in more
stable environment.

93

00:04:09,050 --> 00:04:11,660

So trying to get to the
amenities of ISS, you know,

94

00:04:11,660 --> 00:04:14,710

with the full toilet and a sleep
station and all those things,

95

00:04:14,710 --> 00:04:16,360

you know, trying to get there
in a hurry, you could see

96

00:04:16,360 --> 00:04:17,650

that there would be
an advantage to that.

97

00:04:17,650 --> 00:04:21,000

And from a vehicle perspective
you have a limited number

98

00:04:21,000 --> 00:04:26,000

of consumables on board the
Soyuz so if you save some

99

00:04:26,000 --> 00:04:27,950

of those type of
life support type

100

00:04:27,950 --> 00:04:31,220

of consumables then you would
have that on the back end.

101

00:04:31,220 --> 00:04:33,560

So after Soyuz docks
now you have some margin

102

00:04:33,560 --> 00:04:35,850

in case you need
it for, you know,

103

00:04:35,850 --> 00:04:37,700

after undocking then
you would have more life

104

00:04:37,700 --> 00:04:38,580

support capability.

105

00:04:38,580 --> 00:04:41,030

So there are a few advantages to doing this

106
00:04:41,030 --> 00:04:43,170
with the four orbit scheme as well.

107
00:04:43,170 --> 00:04:45,130
>> I think that we've heard in the past that one

108
00:04:45,130 --> 00:04:48,180
of the advantages of the longer trip of two days was

109
00:04:48,180 --> 00:04:49,790
to give crew members an opportunity

110
00:04:49,790 --> 00:04:52,390
to become adapted to the environment.

111
00:04:52,390 --> 00:04:57,740
I suppose they can do that adaptation in a larger area.

112
00:04:57,740 --> 00:04:59,010
>> Well, that's true.

113
00:04:59,010 --> 00:05:01,560
And so we still have kind of a lot of work

114
00:05:01,560 --> 00:05:03,490
to make sure we understand exactly the space adaptation

115
00:05:03,490 --> 00:05:04,970
piece of it.

116

00:05:04,970 --> 00:05:07,090

You know, I think
getting there sooner

117

00:05:07,090 --> 00:05:09,590

in this particular case
it's much, much sooner

118

00:05:09,590 --> 00:05:11,940

and we were talking we launch
and then six hours later you're

119

00:05:11,940 --> 00:05:13,250

at the Space Station
so it could be

120

00:05:13,250 --> 00:05:14,750

that you actually arrive
before you are really

121

00:05:14,750 --> 00:05:17,550

into a space adaptation
situation, you know,

122

00:05:17,550 --> 00:05:19,550

as opposed to something
in between.

123

00:05:19,550 --> 00:05:23,100

So anyway, but our astronaut
core will be looking at this

124

00:05:23,100 --> 00:05:24,710

from a Soyuz perspective
pretty carefully

125

00:05:24,710 --> 00:05:26,770

to make sure we understand,
you know, are we going

126

00:05:26,770 --> 00:05:28,170
to get an opportunity
to have the comers get

127

00:05:28,170 --> 00:05:31,390
out of their SoCal suits, their
space suits, in this time frame

128

00:05:31,390 --> 00:05:33,430
and we have a few
questions associated with it

129

00:05:33,430 --> 00:05:34,950
but probability all in all

130

00:05:34,950 --> 00:05:38,720
from a crew comfort standpoint
there could be some advantages.

131

00:05:38,720 --> 00:05:42,010
>> And as you say, the ultimate
design here is to use this

132

00:05:42,010 --> 00:05:43,930
for Soyuz is not
to necessarily use

133

00:05:43,930 --> 00:05:45,360
if for progresses all the time.

134

00:05:45,360 --> 00:05:46,480
This is a test.

135

00:05:46,480 --> 00:05:47,720
>> That's exactly right.

136

00:05:47,720 --> 00:05:50,510
Its intended applicability

like I said, is for the Soyuz.

137

00:05:50,510 --> 00:05:53,620

They have done -- they have done some testing on Progresses

138

00:05:53,620 --> 00:05:54,740

and their going to do more testing

139

00:05:54,740 --> 00:05:56,960

on Progresses before we try it on the Soyuz.

140

00:05:56,960 --> 00:05:59,560

So it will be closer to more than a year

141

00:05:59,560 --> 00:06:02,910

out before we would even attempt it with the Soyuz.

142

00:06:02,910 --> 00:06:05,660

>> From the point of you and your team in this room,

143

00:06:05,660 --> 00:06:09,530

how does it change your preparations in getting ready

144

00:06:09,530 --> 00:06:12,200

and executing what's going to happen today?

145

00:06:12,200 --> 00:06:14,800

>> Well, from the mission control standpoint, you know,

146

00:06:14,800 --> 00:06:16,640

we've had a trajectory

off a Soyuz

147

00:06:16,640 --> 00:06:19,270
and visiting officers have
been studying the situation

148

00:06:19,270 --> 00:06:21,340
and working with the Russian
colleagues for quite some time.

149

00:06:21,340 --> 00:06:23,260
So the sort of preparation
leading

150

00:06:23,260 --> 00:06:26,180
up to today has been
pretty extensive.

151

00:06:26,180 --> 00:06:29,290
But, you know, we're ready
and our, both our trajectory

152

00:06:29,290 --> 00:06:30,450
and our visiting
vehicle folks are going

153

00:06:30,450 --> 00:06:34,480
to be carefully monitoring the
progress of the Progress today.

154

00:06:34,480 --> 00:06:38,100
And from this standpoint,
you know,

155

00:06:38,100 --> 00:06:40,160
if anything it's a much
shorter shift, you know,

156

00:06:40,160 --> 00:06:42,120
instead of two days it's a day.

157

00:06:42,120 --> 00:06:45,740

So it's going to be interesting
to see it all happen in one day.

158

00:06:45,740 --> 00:06:50,800

Also from a planning perspective
with our crew members

159

00:06:50,800 --> 00:06:53,870

for a docking, we typically
would have our crew awake

160

00:06:53,870 --> 00:06:56,200

and so we have six
crew members on board.

161

00:06:56,200 --> 00:06:57,570

Three of them are Russian

162

00:06:57,570 --> 00:07:00,330

and those three Russians
are sleep-shifting

163

00:07:00,330 --> 00:07:02,170

and so they're going
to go to bed

164

00:07:02,170 --> 00:07:04,470

at a different time than
our US crew members.

165

00:07:04,470 --> 00:07:06,900

This is kind of a new
way to do business.

166

00:07:06,900 --> 00:07:10,420

And then our US crew members
are going to have a sleep period

167

00:07:10,420 --> 00:07:12,700
through the docking time frame
that are going to get up just

168

00:07:12,700 --> 00:07:15,630
to see the docking just in
case some contingency happens

169

00:07:15,630 --> 00:07:18,280
and that sort of thing and
just to monitor the docking.

170

00:07:18,280 --> 00:07:20,720
So we are doing what's
called a split shift

171

00:07:20,720 --> 00:07:22,400
and so it's a little bit
different and stuff but,

172

00:07:22,400 --> 00:07:24,690
you know, our planners have
been working very closely

173

00:07:24,690 --> 00:07:26,200
with the Russian planners
and trying to make sure

174

00:07:26,200 --> 00:07:29,520
that we don't accidentally
wake up the Russian crew

175

00:07:29,520 --> 00:07:31,720
when they're asleep, when
we're done docking the US crew

176

00:07:31,720 --> 00:07:35,540
and trying to make sure that
the activities and, you know,

177

00:07:35,540 --> 00:07:37,570

we have a Russian crew member
that sleeps in the US segment

178

00:07:37,570 --> 00:07:39,590

and try to make sure that we
don't do any activities right

179

00:07:39,590 --> 00:07:41,110

in his module and
that sort of thing.

180

00:07:41,110 --> 00:07:42,960

So there have been a
few other preparations

181

00:07:42,960 --> 00:07:44,950

that I would consider
non-standard.

182

00:07:44,950 --> 00:07:46,920

But we're actually learning
there is some advantages

183

00:07:46,920 --> 00:07:49,420

to doing this and it really
helps our US crew members

184

00:07:49,420 --> 00:07:51,180

to not have to sleep-shift
and sleep-shift back

185

00:07:51,180 --> 00:07:51,940

and that sort of thing.

186

00:07:51,940 --> 00:07:55,040

So we are seeing, we're finding
a lot out that actually we

187

00:07:55,040 --> 00:07:56,650
like about this scheme.

188
00:07:56,650 --> 00:07:58,460
>> Would you imagine
then that this afternoon

189
00:07:58,460 --> 00:08:00,560
and this evening what
actually gets done

190
00:08:00,560 --> 00:08:03,950
in this room is the same as what
was done before just shorter?

191
00:08:03,950 --> 00:08:05,010
>> That's exactly right.

192
00:08:05,010 --> 00:08:08,520
So the change here is really
in the first two orbits,

193
00:08:08,520 --> 00:08:11,450
the first two orbits of the
Progress and then around two

194
00:08:11,450 --> 00:08:12,760
and a half hours or so prior

195
00:08:12,760 --> 00:08:15,300
to the docking everything
becomes standard.

196
00:08:15,300 --> 00:08:17,440
So it's exactly the
same rendezvous

197
00:08:17,440 --> 00:08:20,130
that we've always done and
it's the same for the crew,

198

00:08:20,130 --> 00:08:22,100
there are no new procedures,
no training differences

199

00:08:22,100 --> 00:08:22,890
or anything like that.

200

00:08:22,890 --> 00:08:25,590
So really what's changed
is the first two orbits.

201

00:08:25,590 --> 00:08:27,820
We're getting there faster and
we're getting up to the point

202

00:08:27,820 --> 00:08:31,290
of the automated rendezvous
docking sequence a lot faster.

203

00:08:31,290 --> 00:08:33,190
And nothing after
that has changed.

204

00:08:33,190 --> 00:08:35,340
So I anticipate that watching
the rendezvous docking will be

205

00:08:35,340 --> 00:08:38,230
just like any other rendezvous
docking case that we've had

206

00:08:38,230 --> 00:08:40,140
and we're just extremely
interested

207

00:08:40,140 --> 00:08:41,520
in seeing this first
couple orbits

208

00:08:41,520 --> 00:08:43,750

and making sure that
that goes well.

209

00:08:43,750 --> 00:08:44,900

I do want to mention this.

210

00:08:44,900 --> 00:08:48,370

Those first two orbits that
at the 47 Progress launch,

211

00:08:48,370 --> 00:08:53,200

they did try a scheme like this
with a similar ground targeting

212

00:08:53,200 --> 00:08:55,470

but of course they took the full
amount of time to get there,

213

00:08:55,470 --> 00:08:57,740

the full 34 orbits
to get to station.

214

00:08:57,740 --> 00:09:00,590

But they did do some testing
on the 47 Progress launch.

215

00:09:00,590 --> 00:09:04,780

So I'm feeling like this
should probably go well today.

216

00:09:04,780 --> 00:09:07,890

>> I assume that at some
point, or up to some point

217

00:09:07,890 --> 00:09:10,560

that you could change
your mind and go back

218

00:09:10,560 --> 00:09:13,160
to the regular two day approach.

219

00:09:13,160 --> 00:09:15,890
Yeah, so we have had a lot
of discussions about that

220

00:09:15,890 --> 00:09:19,200
and we are absolutely ready to
download to a 34 orbit scheme.

221

00:09:19,200 --> 00:09:22,510
We have all of our analysis in
place for all of our solar rays

222

00:09:22,510 --> 00:09:25,230
and we are definitely
good to go.

223

00:09:25,230 --> 00:09:27,790
That would put it on Friday,
that would put our docking

224

00:09:27,790 --> 00:09:29,810
on Friday and our
team is prepared to go

225

00:09:29,810 --> 00:09:31,240
and execute that plan as well.

226

00:09:31,240 --> 00:09:34,130
So if our Russian colleagues
get uncomfortable or they find

227

00:09:34,130 --> 00:09:35,270
that they can't do the scheme

228

00:09:35,270 --> 00:09:38,520
that they had planned then
our plan is just to download

229

00:09:38,520 --> 00:09:40,760
to a nominal standard
docking timeframe.

230

00:09:40,760 --> 00:09:43,450
>> Is there some
deadline by which you have

231

00:09:43,450 --> 00:09:44,870
to make that decision?

232

00:09:44,870 --> 00:09:47,620
>> Well, you know, I talked
about two and a half hours prior

233

00:09:47,620 --> 00:09:50,000
to the start of docking
is when they kick

234

00:09:50,000 --> 00:09:52,580
of the automated rendezvous
and docking sequence.

235

00:09:52,580 --> 00:09:56,590
And so really, any time up to
then we could make that call.

236

00:09:56,590 --> 00:09:58,370
It could be that right
away that aside, you know,

237

00:09:58,370 --> 00:10:00,200
they have some sort of issue
with the ground targeting

238

00:10:00,200 --> 00:10:02,380
or something like that and
then we all know in advance.

239

00:10:02,380 --> 00:10:04,730

And then it could be that you're leading right up to the event

240

00:10:04,730 --> 00:10:07,440

and you realize that, you know, maybe you're not in the spot

241

00:10:07,440 --> 00:10:08,830

that you had anticipated that you would be

242

00:10:08,830 --> 00:10:10,070

and so it's time to call it off.

243

00:10:10,070 --> 00:10:12,080

And then once you get into the automated rendezvous

244

00:10:12,080 --> 00:10:13,820

and docking sequence you can always call it off

245

00:10:13,820 --> 00:10:17,210

at that point just as we always can with standard aborts.

246

00:10:17,210 --> 00:10:18,210

>> As we learned last week.

247

00:10:18,210 --> 00:10:20,120

>> That's right, exactly.

248

00:10:20,120 --> 00:10:21,850

>> So everything -- at this point everything is still

249

00:10:21,850 --> 00:10:23,350

on schedule and ready to go?

250

00:10:23,350 --> 00:10:26,580

>> Yes. So this morning we did what's called a optimal

251

00:10:26,580 --> 00:10:28,710

propellant maneuver which is a new maneuver

252

00:10:28,710 --> 00:10:30,950

that we just happened to have a new maneuver associated

253

00:10:30,950 --> 00:10:35,880

with the same Progress vehicle where we flew a trajectory

254

00:10:35,880 --> 00:10:40,230

which is a very propellant smart trajectory which helps us save

255

00:10:40,230 --> 00:10:42,470

on our propellant and --

256

00:10:42,470 --> 00:10:44,790

>> You're talking about the station's trajectory?

257

00:10:44,790 --> 00:10:45,800

>> The station, that right.

258

00:10:45,800 --> 00:10:47,590

So the Space Station and it had to go

259

00:10:47,590 --> 00:10:49,410

through a very large maneuver.

260

00:10:49,410 --> 00:10:52,760

It's pretty unusual for us but
because of the way the vehicle,

261

00:10:52,760 --> 00:10:54,300

the drag on the vehicle
it's very,

262

00:10:54,300 --> 00:10:57,900

very limited atmosphere that's
up there, we are able to send --

263

00:10:57,900 --> 00:10:59,780

we did send a bunch
of series of commands

264

00:10:59,780 --> 00:11:03,620

to maneuver the station's very
propellant optimal trajectory

265

00:11:03,620 --> 00:11:05,500

and it was the first
time we had done that.

266

00:11:05,500 --> 00:11:07,540

We did it this morning
with no issues at all.

267

00:11:07,540 --> 00:11:10,120

So we're very excited,
we're in -- we're basically,

268

00:11:10,120 --> 00:11:12,770

mostly in the -- in our
attitude that is needed

269

00:11:12,770 --> 00:11:16,040

for the docking tonight and
all the other preparations are

270

00:11:16,040 --> 00:11:17,250

going fine.

271

00:11:17,250 --> 00:11:19,840

>> Great. Dina, thanks for
the -- thanks for the update.

272

00:11:19,840 --> 00:11:20,710

I appreciate it.