



1  
00:00:08,310 --> 00:00:06,150  
to t minus one minute and counting

2  
00:00:17,510 --> 00:00:08,320  
the vehicle is now on internal power and

3  
00:00:17,520 --> 00:00:30,710  
everything is fine we're ready for lunch

4  
00:00:35,590 --> 00:00:33,990  
t-minus 30 seconds and counting the

5  
00:00:40,150 --> 00:00:35,600  
ground surface structures and umbilicals

6  
00:00:43,590 --> 00:00:41,270  
t-minus

7  
00:00:45,270 --> 00:00:43,600  
20 seconds and counting the launch

8  
00:00:50,310 --> 00:00:45,280  
command has now been issued to the

9  
00:00:50,320 --> 00:00:54,229  
t-minus 15 and counting

10  
00:00:56,389 --> 00:00:55,590  
t-minus 10

11  
00:00:57,270 --> 00:00:56,399  
9

12  
00:00:58,069 --> 00:00:57,280  
8

13  
00:00:59,110 --> 00:00:58,079

seven

14

00:01:00,069 --> 00:00:59,120

six

15

00:01:00,950 --> 00:01:00,079

five

16

00:01:02,069 --> 00:01:00,960

four

17

00:01:03,029 --> 00:01:02,079

three

18

00:01:05,350 --> 00:01:03,039

two

19

00:01:05,350 --> 00:01:05,360

one

20

00:01:11,510 --> 00:01:08,070

and ignition

21

00:01:14,230 --> 00:01:11,520

liftoff liftoff of kevin ford evgeny

22

00:01:16,070 --> 00:01:14,240

tarakin and oleg novitskiy as they head

23

00:01:33,030 --> 00:01:16,080

on a two-day trip to the international

24

00:01:36,550 --> 00:01:34,870

30 seconds into the flight good first

25

00:01:38,710 --> 00:01:36,560

stage performance the soyuz delivering

26

00:01:41,030 --> 00:01:38,720

102 tons of thrust from its four

27

00:01:43,429 --> 00:01:41,040

boosters and single engine the first

28

00:01:45,990 --> 00:01:43,439

stage of the soyuz measures 68 feet in

29

00:01:47,670 --> 00:01:46,000

length and 24 feet in diameter it is

30

00:02:03,109 --> 00:01:47,680

burning liquid fuel for the first two

31

00:02:03,119 --> 00:02:14,550

on board

32

00:02:18,309 --> 00:02:16,470

one minute ten seconds into the flight

33

00:02:32,550 --> 00:02:18,319

velocity is one thousand one hundred

34

00:02:36,550 --> 00:02:34,630

everything's fine on board

35

00:02:38,229 --> 00:02:36,560

one minute 30 seconds into the flight

36

00:02:43,830 --> 00:02:38,239

everything looking green the crew is

37

00:02:43,840 --> 00:02:50,790

we heard alarms

38

00:02:50,800 --> 00:03:01,110

but everything is okay on board

39

00:03:05,589 --> 00:03:02,790

one minute 54 seconds into the flight

40

00:03:09,670 --> 00:03:05,599

the escape tower has been jettisoned 120

41

00:03:12,149 --> 00:03:10,710

everything

42

00:03:13,350 --> 00:03:12,159

four strap-on boosters have now been

43

00:03:14,949 --> 00:03:13,360

jettisoned these have completed their

44

00:03:17,030 --> 00:03:14,959

job and have dropped away at an altitude

45

00:03:43,430 --> 00:03:17,040

of 28 statute miles the soyuz is now

46

00:03:46,710 --> 00:03:45,190

two minutes 38 seconds the launch route

47

00:03:50,789 --> 00:03:46,720

has now been jettisoned the rocket's

48

00:03:54,149 --> 00:03:52,710

there's a view inside the hippopotamus

49

00:03:55,750 --> 00:03:54,159

they're up above the crew that is of

50

00:03:57,350 --> 00:03:55,760

guinea tarelkin there on the far right

51  
00:03:59,110 --> 00:03:57,360  
hand side oleg novitskiy who is the

52  
00:04:00,789 --> 00:03:59,120  
commander there at the bottom left-hand

53  
00:04:04,550 --> 00:04:00,799  
side just out of you as nasa astronaut

54  
00:04:08,229 --> 00:04:06,470  
remembers feel good three minutes three

55  
00:04:10,949 --> 00:04:08,239  
seconds into the flight the spacecraft

56  
00:04:17,749 --> 00:04:10,959  
now traveling at a speed of 4700 miles

57  
00:04:21,590 --> 00:04:19,030  
the core stage of the vehicle is

58  
00:04:23,830 --> 00:04:21,600  
performing as expected

59  
00:04:25,510 --> 00:04:23,840  
it is 56 feet in length 13 and a half

60  
00:04:28,150 --> 00:04:25,520  
feet in diameter it has a single engine

61  
00:04:29,670 --> 00:04:28,160  
with four fuel chambers providing 96

62  
00:04:31,590 --> 00:04:29,680  
tons of thrust for its three minutes and

63  
00:04:33,189 --> 00:04:31,600

28 seconds of operation

64

00:04:36,710 --> 00:04:33,199

this stage will continue to burn until

65

00:04:38,629 --> 00:04:36,720

the four minute 43 second mark

66

00:04:40,230 --> 00:04:38,639

the soyuz uses what's called a hot stage

67

00:04:41,990 --> 00:04:40,240

technique coming up the third stage will

68

00:04:44,070 --> 00:04:42,000

ignite while the second stage is still

69

00:04:45,350 --> 00:04:44,080

burning this is why the soyuz has an

70

00:04:50,469 --> 00:04:45,360

open area in between the second and

71

00:04:55,670 --> 00:04:52,310

three minutes 45 seconds into the flight

72

00:05:03,909 --> 00:04:57,030

the crew and the ground teams reporting

73

00:05:03,919 --> 00:05:07,670

now crossing the four minute mark

74

00:05:12,230 --> 00:05:10,870

240 seconds all parameters are nominal

75

00:05:18,230 --> 00:05:12,240

whatever

76

00:05:21,029 --> 00:05:19,749

200

77

00:05:24,390 --> 00:05:21,039

50 seconds

78

00:05:33,189 --> 00:05:24,400

pitch your rotation nominal for members

79

00:05:33,199 --> 00:05:39,469

four minutes 30 seconds into the flight

80

00:05:44,870 --> 00:05:42,870

270 seconds control system parameters

81

00:05:55,909 --> 00:05:44,880

are nominal

82

00:06:00,790 --> 00:05:57,350

the third stage has ignited that the

83

00:06:00,800 --> 00:06:05,110

everything's fine on board

84

00:06:09,510 --> 00:06:07,430

and we have second stage

85

00:06:11,270 --> 00:06:09,520

separation confirmed now five minutes

86

00:06:13,189 --> 00:06:11,280

and seven seconds into the flight 100

87

00:06:14,469 --> 00:06:13,199

seconds mission there's about four

88

00:06:16,309 --> 00:06:14,479

minutes of powered flight remaining the

89

00:06:18,230 --> 00:06:16,319

soyuz now being propelled by the single

90

00:06:20,629 --> 00:06:18,240

engine of its third stage this engine is

91

00:06:21,749 --> 00:06:20,639

providing 30 tons of thrust

92

00:06:28,590 --> 00:06:21,759

and will burn for a little more than

93

00:06:28,600 --> 00:06:34,230

320 seconds all parameters are nominal

94

00:06:34,240 --> 00:06:39,390

is fine on board

95

00:06:47,029 --> 00:06:42,070

330 seconds

96

00:06:51,510 --> 00:06:49,110

five minutes 45 seconds into the flight

97

00:06:53,909 --> 00:06:51,520

of novitskiy tarelkin and for the third

98

00:06:55,589 --> 00:06:53,919

stage is performing as expected as we

99

00:07:02,390 --> 00:06:55,599

look live inside the mission control

100

00:07:02,400 --> 00:07:09,670

now crossing the six minute mark

101  
00:07:09,680 --> 00:07:13,029  
360.

102  
00:07:13,039 --> 00:07:28,110  
it's your rotation nominal everything's

103  
00:07:33,830 --> 00:07:30,629  
380 seconds

104  
00:07:35,510 --> 00:07:33,840  
stage three thrusters are nominal

105  
00:07:37,110 --> 00:07:35,520  
six minutes and 30 seconds these

106  
00:07:39,189 --> 00:07:37,120  
performance calls continue from the team

107  
00:07:40,790 --> 00:07:39,199  
watching over the soyuz as it launches

108  
00:07:42,230 --> 00:07:40,800  
this crew into orbit

109  
00:07:46,070 --> 00:07:42,240  
everything is working as expected

110  
00:07:49,270 --> 00:07:47,830  
again that is

111  
00:07:51,029 --> 00:07:49,280  
evgeny tarelkin there on the far

112  
00:07:52,230 --> 00:07:51,039  
right-hand side oleg novitskiy there at

113  
00:07:56,230 --> 00:07:52,240

the bottom left-hand side just out of

114

00:08:00,070 --> 00:07:58,150

the hippopotamus again that is uh there

115

00:08:02,230 --> 00:08:00,080

was given to the crew by navitsky's

116

00:08:04,869 --> 00:08:02,240

daughter

117

00:08:06,230 --> 00:08:04,879

that is the first test to find out once

118

00:08:09,909 --> 00:08:06,240

the crew has reached orbit whenever that

119

00:08:12,390 --> 00:08:10,830

20

120

00:08:37,269 --> 00:08:12,400

seconds

121

00:08:40,230 --> 00:08:37,279

the vehicle now traveling 13 500 miles

122

00:08:42,469 --> 00:08:40,240

per hour 150 seconds mission nominal

123

00:08:44,149 --> 00:08:42,479

everything is final board once the third

124

00:08:45,750 --> 00:08:44,159

stage delivers the soyuz to orbit and

125

00:08:47,590 --> 00:08:45,760

the module is separated a series of

126

00:08:49,190 --> 00:08:47,600

pre-programmed commands will be executed

127

00:08:50,550 --> 00:08:49,200

to prepare the soyuz for orbital

128

00:08:53,430 --> 00:08:50,560

operations

129

00:08:55,190 --> 00:08:53,440

these stored commands called time tagged

130

00:08:57,590 --> 00:08:55,200

command to allow many of the soyuz's

131

00:09:00,150 --> 00:08:57,600

systems to be automatically activated by

132

00:09:04,470 --> 00:09:00,160

onboard computers at precise times

133

00:09:04,480 --> 00:09:12,389

under a minute to go

134

00:09:12,399 --> 00:09:31,990

everything's fine on board

135

00:09:32,000 --> 00:09:43,670

same on board

136

00:09:49,670 --> 00:09:46,150

everything is nominal

137

00:09:49,680 --> 00:09:59,509

620

138

00:09:59,519 --> 00:10:05,030

inaudible

139

00:10:07,590 --> 00:10:06,150  
we have third stage cut off and

140

00:10:09,190 --> 00:10:07,600  
separation confirmed the single

141

00:10:10,550 --> 00:10:09,200  
liquid-fueled engine has shut down and

142

00:10:13,509 --> 00:10:10,560  
has dropped away at an altitude of about

143

00:10:14,790 --> 00:10:13,519  
125 statute miles

144

00:10:16,230 --> 00:10:14,800  
congratulations third stage is

145

00:10:17,670 --> 00:10:16,240  
performing an avoidance maneuver by

146

00:10:18,870 --> 00:10:17,680  
opening a valve and it's liquid oxygen

147

00:10:22,550 --> 00:10:18,880  
tank

148

00:10:24,550 --> 00:10:22,560  
we are happy that the launch is okay

149

00:10:26,949 --> 00:10:24,560  
and we have confirmation of spacecraft

150

00:10:27,990 --> 00:10:26,959  
separation and solar array deployment

151

00:10:29,829 --> 00:10:28,000

station

152

00:10:32,069 --> 00:10:29,839

congratulations the soyuz capsule and