



1  
00:00:14,549 --> 00:00:11,430  
halfway through one of the most

2  
00:00:16,950 --> 00:00:14,559  
productive years in recent space history

3  
00:00:19,910 --> 00:00:16,960  
nasa's exploration systems development

4  
00:00:25,109 --> 00:00:19,920  
division is moving humans ever closer to

5  
00:00:30,550 --> 00:00:27,670  
the space launch system nasa's next

6  
00:00:32,790 --> 00:00:30,560  
generation deep space launch vehicle had

7  
00:00:36,150 --> 00:00:32,800  
an intense spring full of development

8  
00:00:40,310 --> 00:00:38,229  
testing on the avionics system

9  
00:00:42,790 --> 00:00:40,320  
responsible for controlling the space

10  
00:00:45,029 --> 00:00:42,800  
launch system's solid rocket boosters

11  
00:00:48,069 --> 00:00:45,039  
began in april

12  
00:00:50,150 --> 00:00:48,079  
the avionics system will ignite steer

13  
00:00:52,709 --> 00:00:50,160

and jettison the two solid rocket

14

00:00:56,630 --> 00:00:52,719

boosters and will continue to undergo an

15

00:00:59,349 --> 00:00:56,640

extensive series of tests this summer

16

00:01:01,750 --> 00:00:59,359

in may structural tests on the sls

17

00:01:03,910 --> 00:01:01,760

booster forward skirt proved it could

18

00:01:08,310 --> 00:01:03,920

withstand millions of pounds of launch

19

00:01:14,230 --> 00:01:11,429

the sls core stage will be powered by

20

00:01:16,630 --> 00:01:14,240

four rs-25 engines that are now

21

00:01:18,070 --> 00:01:16,640

undergoing preparation for test firing

22

00:01:19,749 --> 00:01:18,080

at the stennis space center in

23

00:01:21,830 --> 00:01:19,759

mississippi

24

00:01:24,149 --> 00:01:21,840

following initial testing the engines

25

00:01:26,469 --> 00:01:24,159

will be integrated with the core stage

26  
00:01:30,310 --> 00:01:26,479  
and the entire assembly will be tested

27  
00:01:35,350 --> 00:01:33,510  
because the sls core stage is 50

28  
00:01:38,550 --> 00:01:35,360  
longer than the saturn moon rocket

29  
00:01:40,630 --> 00:01:38,560  
stages the mothballed b2 test stand and

30  
00:01:42,710 --> 00:01:40,640  
the main derrick crane are currently

31  
00:01:44,870 --> 00:01:42,720  
being modified and upgraded to

32  
00:01:49,030 --> 00:01:44,880  
accommodate this enormous structural

33  
00:01:53,030 --> 00:01:51,109  
production on the core stage structure

34  
00:01:56,469 --> 00:01:53,040  
and propellant tanks continues at the

35  
00:01:59,590 --> 00:01:56,479  
michoud assembly facility in louisiana

36  
00:02:01,990 --> 00:01:59,600  
34 primary structure components and 20

37  
00:02:04,550 --> 00:02:02,000  
rings have been welded to build the core

38  
00:02:06,950 --> 00:02:04,560

stage propellant tanks including nine

39

00:02:09,830 --> 00:02:06,960

barrels and all the rings needed for

40

00:02:13,430 --> 00:02:09,840

sls's first flight

41

00:02:16,390 --> 00:02:13,440

a 5 scale model of the sls was ignited

42

00:02:18,949 --> 00:02:16,400

to test how both low and high frequency

43

00:02:21,270 --> 00:02:18,959

sound waves will affect the rocket as it

44

00:02:23,190 --> 00:02:21,280

fires in solid rocket boosters and main

45

00:02:24,869 --> 00:02:23,200

engines on the launch pad prior to

46

00:02:27,350 --> 00:02:24,879

liftoff

47

00:02:30,070 --> 00:02:27,360

these ongoing tests are collecting data

48

00:02:32,470 --> 00:02:30,080

from over 200 sensors to study the

49

00:02:34,710 --> 00:02:32,480

acoustic impact on the spacecraft and

50

00:02:42,229 --> 00:02:34,720

verify the design of its water-based

51  
00:02:46,869 --> 00:02:44,470  
a major milestone in the effort to

52  
00:02:50,070 --> 00:02:46,879  
transform kennedy space center into a

53  
00:02:52,229 --> 00:02:50,080  
multi-user spaceport was met when ground

54  
00:02:54,070 --> 00:02:52,239  
systems development and operations

55  
00:02:56,229 --> 00:02:54,080  
completed the initial design and

56  
00:02:59,589 --> 00:02:56,239  
technology phase of the preliminary

57  
00:03:04,309 --> 00:03:02,309  
gsdo is modifying the spaceport's

58  
00:03:06,390 --> 00:03:04,319  
infrastructure to support several

59  
00:03:08,070 --> 00:03:06,400  
different spacecraft and rocket launch

60  
00:03:10,229 --> 00:03:08,080  
needs

61  
00:03:11,830 --> 00:03:10,239  
firing room four at the launch control

62  
00:03:14,630 --> 00:03:11,840  
center at kennedy space center in

63  
00:03:17,350 --> 00:03:14,640

florida is being renovated into four

64

00:03:19,830 --> 00:03:17,360

separate launch areas to serve nasa and

65

00:03:22,229 --> 00:03:19,840

commercial users needs

66

00:03:25,030 --> 00:03:22,239

designed to accommodate a multi-user

67

00:03:27,670 --> 00:03:25,040

spaceport the new adaptable rooms can

68

00:03:30,949 --> 00:03:27,680

open up to give more space as needed by

69

00:03:32,949 --> 00:03:30,959

a customer's launch room parameters

70

00:03:35,670 --> 00:03:32,959

upgrades to the mobile launcher at

71

00:03:37,750 --> 00:03:35,680

launch complex 39 are underway with

72

00:03:39,190 --> 00:03:37,760

significant progress toward advanced

73

00:03:41,990 --> 00:03:39,200

usability

74

00:03:44,390 --> 00:03:42,000

gsdo is systematically modernizing the

75

00:03:47,830 --> 00:03:44,400

launcher to meet the increased needs of

76  
00:03:50,390 --> 00:03:47,840  
the more substantial space launch system

77  
00:03:52,309 --> 00:03:50,400  
upgrades include structural work

78  
00:03:55,350 --> 00:03:52,319  
an improved sound suppression water

79  
00:03:57,270 --> 00:03:55,360  
system a redesigned exhaust opening

80  
00:04:00,149 --> 00:03:57,280  
new data connectivity to the launch

81  
00:04:04,550 --> 00:04:00,159  
control center and updates to the power

82  
00:04:08,390 --> 00:04:06,630  
after the exploration flight test 1

83  
00:04:10,710 --> 00:04:08,400  
mission is complete and the capsule

84  
00:04:12,869 --> 00:04:10,720  
lands in the pacific ocean the ground

85  
00:04:15,910 --> 00:04:12,879  
systems development and operations and

86  
00:04:18,069 --> 00:04:15,920  
orion programs and the u.s navy will

87  
00:04:20,550 --> 00:04:18,079  
retrieve the capsule and ship it back to

88  
00:04:23,230 --> 00:04:20,560

florida for reuse

89

00:04:25,510 --> 00:04:23,240

the return process requires a series of

90

00:04:28,790 --> 00:04:25,520

pre-transportation operations which were

91

00:04:30,469 --> 00:04:28,800

successfully tested in may

92

00:04:32,790 --> 00:04:30,479

workers practiced assembling a

93

00:04:35,510 --> 00:04:32,800

transportation fixture that will be used

94

00:04:41,270 --> 00:04:35,520

to move future orion crew modules across

95

00:04:45,909 --> 00:04:43,670

the newly renovated flight control room

96

00:04:48,070 --> 00:04:45,919

at the johnson space center in houston

97

00:04:50,950 --> 00:04:48,080

played host to members of the media and

98

00:04:52,629 --> 00:04:50,960

top nasa officials in april

99

00:04:54,870 --> 00:04:52,639

the white flight control room will

100

00:04:57,990 --> 00:04:54,880

support the orion spacecraft during

101  
00:04:59,990 --> 00:04:58,000  
nasa's deep space exploration missions

102  
00:05:02,469 --> 00:05:00,000  
in may the room was used in a joint

103  
00:05:05,510 --> 00:05:02,479  
integration simulation along with a team

104  
00:05:08,070 --> 00:05:05,520  
at the kennedy space center in florida

105  
00:05:10,710 --> 00:05:08,080  
the two teams simulated the pre-launch

106  
00:05:13,189 --> 00:05:10,720  
and in orbit phases of orion's mission

107  
00:05:15,270 --> 00:05:13,199  
and solved real-time problems acting as

108  
00:05:17,270 --> 00:05:15,280  
the eyes and ears of the uncrewed

109  
00:05:19,189 --> 00:05:17,280  
spacecraft

110  
00:05:21,670 --> 00:05:19,199  
the rigorous testing on orion's

111  
00:05:24,150 --> 00:05:21,680  
parachute system continued in april and

112  
00:05:26,629 --> 00:05:24,160  
june proving the parachutes are capable

113  
00:05:30,469 --> 00:05:26,639

of surviving potential failures during

114

00:05:32,550 --> 00:05:30,479

both re-entry and launch abort scenarios

115

00:05:34,870 --> 00:05:32,560

the first test simulated an abort

116

00:05:37,670 --> 00:05:34,880

scenario by dropping the capsule from a

117

00:05:39,749 --> 00:05:37,680

height of 13 000 feet and releasing the

118

00:05:42,070 --> 00:05:39,759

main parachutes before the drogue

119

00:05:45,029 --> 00:05:42,080

parachute could deploy or the vehicle

120

00:05:47,270 --> 00:05:45,039

could straighten itself out

121

00:05:50,550 --> 00:05:47,280

the second test pulled the capsule from

122

00:05:53,350 --> 00:05:50,560

the c-17 airplane at an altitude of 35

123

00:05:55,749 --> 00:05:53,360

000 feet with one of the main parachutes

124

00:05:59,990 --> 00:05:55,759

intentionally rigged to skip a crucial

125

00:06:05,029 --> 00:06:01,990

both tests demonstrated the parachute

126  
00:06:07,350 --> 00:06:05,039  
system can tolerate unexpected failures

127  
00:06:09,909 --> 00:06:07,360  
and still carry the capsule safely to

128  
00:06:14,870 --> 00:06:12,150  
after two years of intense production

129  
00:06:16,710 --> 00:06:14,880  
and testing orion's massive heat shield

130  
00:06:18,790 --> 00:06:16,720  
was successfully attached to the crew

131  
00:06:21,510 --> 00:06:18,800  
module in kennedy space center's

132  
00:06:23,990 --> 00:06:21,520  
operations and checkout facility

133  
00:06:26,070 --> 00:06:24,000  
the 16 and a half foot wide ablative

134  
00:06:28,870 --> 00:06:26,080  
shield will protect the capsule from

135  
00:06:31,510 --> 00:06:28,880  
re-entry temperatures of up to 4 000

136  
00:06:33,990 --> 00:06:31,520  
degrees fahrenheit

137  
00:06:35,590 --> 00:06:34,000  
a center of gravity test confirmed that

138  
00:06:38,150 --> 00:06:35,600

all of the ballast was properly

139

00:06:40,309 --> 00:06:38,160

installed in the crew module

140

00:06:42,870 --> 00:06:40,319

the test validated the orion team's

141

00:06:45,830 --> 00:06:42,880

computer models used to calculate the

142

00:06:48,390 --> 00:06:45,840

amount and location of ballast needed to

143

00:06:50,469 --> 00:06:48,400

properly balance the crew module

144

00:06:52,950 --> 00:06:50,479

with the heat shield securely attached

145

00:06:55,350 --> 00:06:52,960

to the capsule the crew module was then

146

00:06:56,629 --> 00:06:55,360

stacked on top of the service module in

147

00:06:58,550 --> 00:06:56,639

june

148

00:07:01,350 --> 00:06:58,560

the stacked modules will undergo

149

00:07:03,589 --> 00:07:01,360

electrical avionic and radio frequency

150

00:07:06,550 --> 00:07:03,599

test to prepare for the exploration

151

00:07:08,469 --> 00:07:06,560

flight test 1 in december

152

00:07:10,950 --> 00:07:08,479

in may astronauts at the neutral

153

00:07:13,749 --> 00:07:10,960

buoyancy laboratory in houston trained

154

00:07:16,150 --> 00:07:13,759

underwater in newly modified spacesuits

155

00:07:19,110 --> 00:07:16,160

to work through simulated operations for

156

00:07:21,510 --> 00:07:19,120

nasa's asteroid retrieval mission

157

00:07:24,150 --> 00:07:21,520

a month later a naval team worked with

158

00:07:26,309 --> 00:07:24,160

orion recovery specialists to train for

159

00:07:28,830 --> 00:07:26,319

a set of procedures to safely retrieve

160

00:07:32,150 --> 00:07:28,840

the capsule and forward bay

161

00:07:34,550 --> 00:07:32,160

cover as exploration systems development

162

00:07:36,790 --> 00:07:34,560

closes in on december's launch of

163

00:07:39,670 --> 00:07:36,800

exploration flight test 1