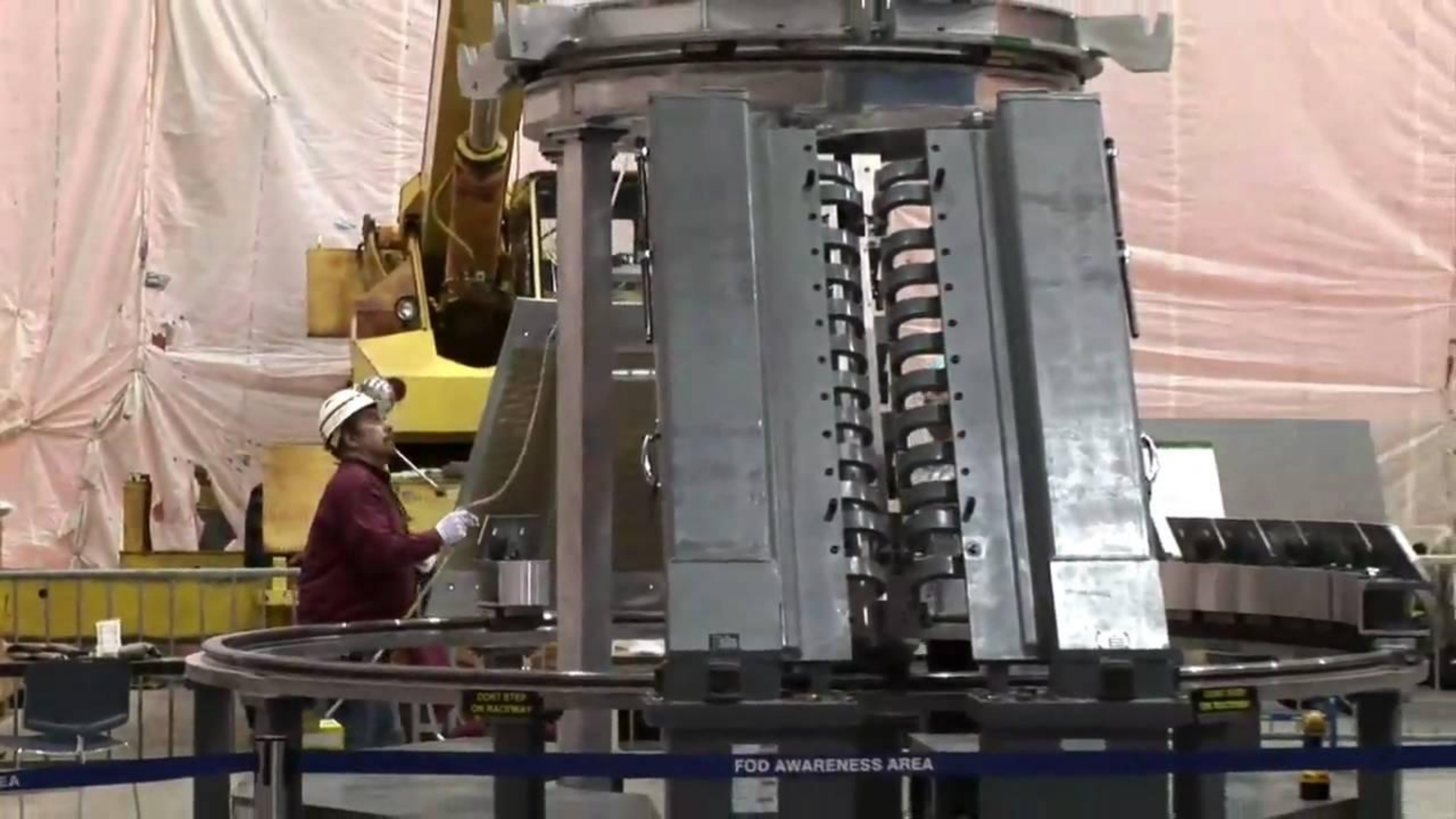
FOD AWARENESS AREA

1
00:00:02,834 --> 00:00:04,133
This is the Constellation

2
00:00:04,133 --> 00:00:08,834
Quarterly Report for June 2009.

3
00:00:08,834 --> 00:00:09,968
Constellation is America's

4
00:00:09,968 --> 00:00:11,300
new space program which

5
00:00:11,300 --> 00:00:12,701
will take crews to the

6
00:00:12,701 --> 00:00:13,934
International Space

7
00:00:13,934 --> 00:00:15,501
Station, return humans to

8
00:00:15,501 --> 00:00:17,100
the Moon and even extend

9
00:00:17,100 --> 00:00:20,801
human presence beyond.

10
00:00:20,801 --> 00:00:21,400
NASA centers around the

11
00:00:21,400 --> 00:00:22,634
country are working

12
00:00:22,634 --> 00:00:24,267
together to design, test

13
00:00:24,267 --> 00:00:26,033

and manufacture hardware

14
00:00:26,033 --> 00:00:27,968
for this new era in human

15
00:00:27,968 --> 00:00:29,467
space exploration.

16
00:00:29,467 --> 00:00:30,968
The Constellation program

17
00:00:30,968 --> 00:00:32,267
has reached a major

18
00:00:32,267 --> 00:00:33,567
turning point as it

19
00:00:33,567 --> 00:00:35,334
prepares to conduct its

20
00:00:35,334 --> 00:00:37,968
first test flights.

21
00:00:37,968 --> 00:00:38,934
The rocket that will launch the

22
00:00:38,934 --> 00:00:40,734
crew into orbit is called

23
00:00:40,734 --> 00:00:43,067
Ares I.

24
00:00:43,067 --> 00:00:44,901
The vehicle is composed of a

25
00:00:44,901 --> 00:00:46,067
five- segment solid rocket

26
00:00:46,067 --> 00:00:47,701
booster for a lower stageà and a

27
00:00:47,701 --> 00:00:50,234
liquid fuel rocket for an upper

28
00:00:50,234 --> 00:00:52,400
stage.

29
00:00:52,400 --> 00:00:53,534
The first test article of

30
00:00:53,534 --> 00:00:55,267
the Ares I is called

31
00:00:55,267 --> 00:00:57,200
Ares I-X.

32
00:00:57,200 --> 00:00:59,167
This major developmental

33
00:00:59,167 --> 00:01:00,501
test flight of full-scale

34
00:01:00,501 --> 00:01:02,100
hardware brings together

35
00:01:02,100 --> 00:01:03,334
the talents of several

36
00:01:03,334 --> 00:01:05,801
NASA centers.

37
00:01:05,801 --> 00:01:08,033
Sections of Ares 1-X were

38
00:01:08,033 --> 00:01:09,133

manufactured at the Glenn

39
00:01:09,133 --> 00:01:11,801
Research Center in Cleveland,

40
00:01:11,801 --> 00:01:13,434
Ohio and the Langley Research

41
00:01:13,434 --> 00:01:15,968
Center in Hampton, Virginia.

42
00:01:19,167 --> 00:01:19,901
At the Kennedy Space

43
00:01:19,901 --> 00:01:21,501
Center in Florida, rocket

44
00:01:21,501 --> 00:01:24,701
parts arrive by rail

45
00:01:24,701 --> 00:01:26,367
and by air.

46
00:01:31,567 --> 00:01:32,534
In Kennedy's Vehicle Assembly

47
00:01:32,534 --> 00:01:34,334
Building, workers carefully

48
00:01:34,334 --> 00:01:36,133
stack the giant components as

49
00:01:36,133 --> 00:01:39,968
the test vehicle takes shape.

50
00:01:39,968 --> 00:01:41,467
The Ares 1-X test flight

51
00:01:41,467 --> 00:01:43,033
is a sub-orbital flight

52
00:01:43,033 --> 00:01:45,734
and will have no crew.

53
00:01:45,734 --> 00:01:46,267
It will ignite a

54
00:01:46,267 --> 00:01:47,834
four-segment solid rocket

55
00:01:47,834 --> 00:01:49,234
booster with a mockup

56
00:01:49,234 --> 00:01:50,634
sitting in for what would

57
00:01:50,634 --> 00:01:52,367
normally be a fifth solid

58
00:01:52,367 --> 00:01:54,400
rocket segment.

59
00:01:54,400 --> 00:01:55,801
The upper stage and crew

60
00:01:55,801 --> 00:01:58,133
vehicle are also mockups,

61
00:01:58,133 --> 00:01:59,267
carefully weighted to

62
00:01:59,267 --> 00:02:00,801
simulate a fully- fueled,

63
00:02:00,801 --> 00:02:03,334

manned Ares I mission.

64
00:02:05,767 --> 00:02:07,467
Loaded with 700 sensors,

65
00:02:07,467 --> 00:02:10,033
the Ares 1-X test flight

66
00:02:10,033 --> 00:02:11,234
will validate computer

67
00:02:11,234 --> 00:02:13,067
modeling methods.

68
00:02:13,067 --> 00:02:13,968
Engineers will get

69
00:02:13,968 --> 00:02:16,000
valuable data on liftoff,

70
00:02:16,000 --> 00:02:17,634
stage separation,

71
00:02:17,634 --> 00:02:19,434
aero-acoustic loads,

72
00:02:19,434 --> 00:02:20,701
thrust oscillation and

73
00:02:20,701 --> 00:02:24,334
other flight dynamics.

74
00:02:24,334 --> 00:02:26,234
In preparation for Ares I-X,

75
00:02:26,234 --> 00:02:29,801
NASA transferred Launch Pad 39B

76
00:02:29,801 --> 00:02:31,133
from the Space Shuttle Program

77
00:02:31,133 --> 00:02:35,000
to the Constellation Program.

78
00:02:35,000 --> 00:02:36,200
Pad B originally was built for

79
00:02:36,200 --> 00:02:38,067
the Saturn V rockets that

80
00:02:38,067 --> 00:02:39,634
launched the Apollo capsules to

81
00:02:39,634 --> 00:02:41,267
the moon.

82
00:02:41,267 --> 00:02:42,067
It was later adapted to

83
00:02:42,067 --> 00:02:43,934
support Skylab and space

84
00:02:43,934 --> 00:02:46,434
shuttle operations.

85
00:02:46,434 --> 00:02:47,267
Now the Kennedy ground

86
00:02:47,267 --> 00:02:48,834
operations team will finish

87
00:02:48,834 --> 00:02:50,667
modifying pad B for the

88
00:02:50,667 --> 00:02:54,167

Ares I-X launch, ushering in

89
00:02:54,167 --> 00:02:55,067
a new generation of

90
00:02:55,067 --> 00:02:57,267
spaceflight hardware.

91
00:02:58,801 --> 00:02:59,567
Surrounding that launch

92
00:02:59,567 --> 00:03:00,801
pad is a highly

93
00:03:00,801 --> 00:03:02,534
sophisticated Lightning

94
00:03:02,534 --> 00:03:04,067
Protection System.

95
00:03:04,067 --> 00:03:05,167
Each of three new

96
00:03:05,167 --> 00:03:06,801
lightning towers reach 500

97
00:03:06,801 --> 00:03:08,801
feet into the air, with an

98
00:03:08,801 --> 00:03:10,801
additional 100-foot

99
00:03:10,801 --> 00:03:13,868
fiberglass mast atop.

100
00:03:13,868 --> 00:03:14,734
This improved lightning

101
00:03:14,734 --> 00:03:16,033
protection system allows

102
00:03:16,033 --> 00:03:17,667
for the taller height of

103
00:03:17,667 --> 00:03:19,100
the Ares I rocket compared

104
00:03:19,100 --> 00:03:20,534
to the space

105
00:03:20,534 --> 00:03:21,667
shuttle.

106
00:03:21,667 --> 00:03:24,100
The Crew Exploration Vehicle for

107
00:03:24,100 --> 00:03:26,834
Constellation is called Orion.

108
00:03:26,834 --> 00:03:28,300
Orion borrows its shape and

109
00:03:28,300 --> 00:03:30,467
aerodynamic performance

110
00:03:30,467 --> 00:03:32,033
from Apollo.

111
00:03:32,033 --> 00:03:33,167
However, the new spacecraft is

112
00:03:33,167 --> 00:03:36,167
greater in size than Apollo,

113
00:03:36,167 --> 00:03:37,634

featuring updated computers,

114
00:03:37,634 --> 00:03:40,767
life support, electronics, heat

115
00:03:40,767 --> 00:03:42,367
protection and other systems.

116
00:03:43,934 --> 00:03:44,801
At the NASA Michoud

117
00:03:44,801 --> 00:03:46,167
Assembly Facility in New

118
00:03:46,167 --> 00:03:47,567
Orleans, Louisiana,

119
00:03:47,567 --> 00:03:49,267
construction has begun on

120
00:03:49,267 --> 00:03:50,567
the Orion crew module

121
00:03:50,567 --> 00:03:52,167
Ground Test Article, with

122
00:03:52,167 --> 00:03:53,667
Lockheed Martin's first

123
00:03:53,667 --> 00:03:55,267
friction stir weld process

124
00:03:55,267 --> 00:03:57,667
on Orion hardware.

125
00:03:57,667 --> 00:03:58,767
When completed, the full-sized,

126
00:03:58,767 --> 00:04:00,133
flight-like

127
00:04:00,133 --> 00:04:01,367
module will be tested in a

128
00:04:01,367 --> 00:04:02,834
variety of ground based

129
00:04:02,834 --> 00:04:04,567
simulations, designed to

130
00:04:04,567 --> 00:04:06,834
recreate the Orion flight

131
00:04:06,834 --> 00:04:08,801
environment.

132
00:04:08,801 --> 00:04:09,434
The structure will

133
00:04:09,434 --> 00:04:10,634
then undergo mechanical

134
00:04:10,634 --> 00:04:12,400
assembly, integration and

135
00:04:12,400 --> 00:04:14,434
testing in New Orleans and

136
00:04:14,434 --> 00:04:17,734
Denver, Colorado.

137
00:04:17,734 --> 00:04:18,868
The Orion spacecraft will

138
00:04:18,868 --> 00:04:19,934

have to endure extreme

139
00:04:19,934 --> 00:04:21,567
temperatures; traveling

140
00:04:21,567 --> 00:04:23,067
from the Earth, to Low

141
00:04:23,067 --> 00:04:25,000
Earth Orbit, to the Moon

142
00:04:25,000 --> 00:04:27,434
and back again.

143
00:04:27,434 --> 00:04:28,567
The blistering return

144
00:04:28,567 --> 00:04:29,467
through Earth's atmosphere

145
00:04:29,467 --> 00:04:30,467
can produce temperatures

146
00:04:30,467 --> 00:04:32,067
roughly five-thousand

147
00:04:32,067 --> 00:04:34,100
degrees Fahrenheit.

148
00:04:34,100 --> 00:04:35,400
NASA studied several

149
00:04:35,400 --> 00:04:36,701
materials for Orion's

150
00:04:36,701 --> 00:04:39,234
Thermal Protection System,

151
00:04:39,234 --> 00:04:40,701
or heat shield, which will

152
00:04:40,701 --> 00:04:41,834
protect the craft during

153
00:04:41,834 --> 00:04:44,234
that reentry process.

154
00:04:44,234 --> 00:04:45,200
That research led to the

155
00:04:45,200 --> 00:04:46,734
choice of a material called

156
00:04:46,734 --> 00:04:48,334
Avcoat which has

157
00:04:48,334 --> 00:04:49,567
a proven history with the

158
00:04:49,567 --> 00:04:51,133
Apollo and Space Shuttle

159
00:04:51,133 --> 00:04:53,133
programs.

160
00:04:53,133 --> 00:04:54,133
After reentering Earth's

161
00:04:54,133 --> 00:04:56,400
atmosphere, Orion will splash

162
00:04:56,400 --> 00:04:58,133
down in the water, where the

163
00:04:58,133 --> 00:04:59,467

spacecraft and its crew will be

164
00:04:59,467 --> 00:05:01,501
recovered.

165
00:05:01,501 --> 00:05:02,434
to rehearse this scenario.

166
00:05:02,434 --> 00:05:03,968
a full size replica of

167
00:05:03,968 --> 00:05:05,701
the Orion spacecraft has been

168
00:05:05,701 --> 00:05:07,100
tested for its performance in

169
00:05:07,100 --> 00:05:08,767
open water

170
00:05:08,767 --> 00:05:09,934
near the Kennedy Space Center

171
00:05:09,934 --> 00:05:11,334
in Florida,

172
00:05:11,334 --> 00:05:12,167
A collaborative effort between

173
00:05:12,167 --> 00:05:14,200
NASA and the Department of

174
00:05:14,200 --> 00:05:16,300
Defense, the test is called the

175
00:05:16,300 --> 00:05:18,934
Post-landing Orion Recovery

176
00:05:18,934 --> 00:05:21,567
Tests, or PORT.

177
00:05:21,567 --> 00:05:22,634
PORT not only reveals to

178
00:05:22,634 --> 00:05:24,267
engineers how the spacecraft

179
00:05:24,267 --> 00:05:25,767
will behave under these

180
00:05:25,767 --> 00:05:27,901
conditions, but also gives

181
00:05:27,901 --> 00:05:29,300
recovery teams their first

182
00:05:29,300 --> 00:05:32,601
experience working with Orion.

183
00:05:32,601 --> 00:05:33,834
In addition, NASA will have a

184
00:05:33,834 --> 00:05:35,601
better understanding of the

185
00:05:35,601 --> 00:05:36,968
motions astronauts will

186
00:05:36,968 --> 00:05:39,834
experience within the craft.

187
00:05:40,467 --> 00:05:41,300
Other water based tests

188
00:05:41,300 --> 00:05:43,133

took place in Maryland,

189
00:05:43,133 --> 00:05:44,400
where a smaller Orion

190
00:05:44,400 --> 00:05:45,567
mockup was placed in more

191
00:05:45,567 --> 00:05:46,667
controlled water

192
00:05:46,667 --> 00:05:48,000
conditions for further

193
00:05:48,000 --> 00:05:49,601
gathering of data.

194
00:05:53,701 --> 00:05:54,534
is the Launch Abort

195
00:05:54,534 --> 00:05:56,167
System, designed to pull the

196
00:05:56,167 --> 00:05:57,834
crew to safety in the event of

197
00:05:57,834 --> 00:05:59,667
an emergency on the launch pad,

198
00:05:59,667 --> 00:06:01,601
or in the early stage of the

199
00:06:01,601 --> 00:06:04,267
climb to orbit.

200
00:06:04,267 --> 00:06:05,167
Preparations are in full

201
00:06:05,167 --> 00:06:06,767
swing for the first test

202
00:06:06,767 --> 00:06:08,133
of the multi-faceted

203
00:06:08,133 --> 00:06:10,801
Launch Abort System.

204
00:06:10,801 --> 00:06:12,501
Called Pad Abort 1, the

205
00:06:12,501 --> 00:06:13,868
test will include the

206
00:06:13,868 --> 00:06:15,501
firing of the Abort Motor,

207
00:06:15,501 --> 00:06:16,767
which pulls the Orion

208
00:06:16,767 --> 00:06:18,133
spacecraft from danger, an

209
00:06:18,133 --> 00:06:19,968
Attitude Control Motor

210
00:06:19,968 --> 00:06:21,400
which provides directional

211
00:06:21,400 --> 00:06:23,367
control, and a Jettison

212
00:06:23,367 --> 00:06:25,501
Motor that separates the

213
00:06:25,501 --> 00:06:26,801

system from the crew

214
00:06:26,801 --> 00:06:28,701
module.

215
00:06:28,701 --> 00:06:29,467
Components of the Launch

216
00:06:29,467 --> 00:06:30,934
Abort System have already

217
00:06:30,934 --> 00:06:32,234
been tested individually,

218
00:06:32,234 --> 00:06:34,000
but the full flight test

219
00:06:34,000 --> 00:06:35,067
will help gather

220
00:06:35,067 --> 00:06:36,234
information about how the

221
00:06:36,234 --> 00:06:37,567
newly-developed system

222
00:06:37,567 --> 00:06:39,801
works together in a real

223
00:06:39,801 --> 00:06:41,334
flight situation.

224
00:06:44,133 --> 00:06:45,133
The Abort Motor, Jettison Motor

225
00:06:45,133 --> 00:06:46,534
and other important components

226
00:06:46,534 --> 00:06:47,434
for Pad Abort 1

227
00:06:47,434 --> 00:06:49,434
have already arrived at

228
00:06:49,434 --> 00:06:50,334
the White Sands

229
00:06:50,334 --> 00:06:52,334
Missile Range near Las Cruces,

230
00:06:52,334 --> 00:06:53,601
New Mexico

231
00:06:53,601 --> 00:06:54,801
where NASA has

232
00:06:54,801 --> 00:06:56,434
completed work on a 92-acre

233
00:06:56,434 --> 00:06:58,968
launch complex.

234
00:06:58,968 --> 00:06:59,634
Included in the

235
00:06:59,634 --> 00:07:00,801
construction is a Gantry

236
00:07:00,801 --> 00:07:01,968
Steel structure which

237
00:07:01,968 --> 00:07:03,100
serves as a combined

238
00:07:03,100 --> 00:07:05,167

launch pad and simulated

239
00:07:05,167 --> 00:07:07,567
launch vehicle.

240
00:07:07,567 --> 00:07:08,601
The Gantry stands one

241
00:07:08,601 --> 00:07:10,067
hundred and thirty feet

242
00:07:10,067 --> 00:07:11,834
tall and will be used in

243
00:07:11,834 --> 00:07:13,267
future test flights for

244
00:07:13,267 --> 00:07:13,968
the Constellation

245
00:07:13,968 --> 00:07:14,434
program.

246
00:07:22,434 --> 00:07:23,367
Other tests this quarter

247
00:07:23,367 --> 00:07:25,133
include a parachute test

248
00:07:25,133 --> 00:07:27,734
for the Ares I first stage.

249
00:07:27,734 --> 00:07:28,501
Managed by the

250
00:07:28,501 --> 00:07:29,767
Marshall Space Flight Center

251
00:07:29,767 --> 00:07:31,434
in Huntsville, Alabamaà

252
00:07:31,434 --> 00:07:32,501
and taking place at

253
00:07:32,501 --> 00:07:33,634
the U.S. Army's Yuma

254
00:07:33,634 --> 00:07:35,067
Proving Grounds in Yuma,

255
00:07:35,067 --> 00:07:36,300
Arizona,

256
00:07:36,300 --> 00:07:37,334
the test featured the

257
00:07:37,334 --> 00:07:39,234
largest rocket parachutes

258
00:07:39,234 --> 00:07:40,934
ever manufactured.

259
00:07:41,467 --> 00:07:42,567
The three main parachutes

260
00:07:42,567 --> 00:07:43,901
measure one-hundred-fifty

261
00:07:43,901 --> 00:07:45,634
feet in diameter and weigh

262
00:07:45,634 --> 00:07:47,767
two-thousand pounds each.

263
00:07:47,767 --> 00:07:48,934

They are designed to

264
00:07:48,934 --> 00:07:50,300
slow the descent of

265
00:07:50,300 --> 00:07:52,067
the huge Ares I solid rocket

266
00:07:52,067 --> 00:07:53,934
motor and provide

267
00:07:53,934 --> 00:07:54,901
a soft landing

268
00:07:54,901 --> 00:07:56,033
in the ocean,

269
00:07:56,033 --> 00:07:56,934
allowing crews to recover

270
00:07:56,934 --> 00:07:58,400
and recycle the stage

271
00:07:58,400 --> 00:08:00,501
for a later launch.

272
00:08:03,934 --> 00:08:05,234
Constellation is engaging

273
00:08:05,234 --> 00:08:06,701
the talents of engineers,

274
00:08:06,701 --> 00:08:07,834
scientists, and

275
00:08:07,834 --> 00:08:09,167
manufacturers across the

276
00:08:09,167 --> 00:08:10,801
country, with every NASA

277
00:08:10,801 --> 00:08:12,300
center involved with its

278
00:08:12,300 --> 00:08:14,400
development.

279
00:08:14,400 --> 00:08:15,534
From wind tunnel testing,

280
00:08:15,534 --> 00:08:17,334
to computer modeling,

281
00:08:17,334 --> 00:08:18,567
to parachute testing,

282
00:08:18,567 --> 00:08:20,167
to rocket firings,

283
00:08:20,167 --> 00:08:21,968
to manufacturing

284
00:08:21,968 --> 00:08:23,567
Constellation is trailblazing

285
00:08:23,567 --> 00:08:25,400
relationships between NASA

286
00:08:25,400 --> 00:08:26,467
centers and

287
00:08:26,467 --> 00:08:29,100
commercial industry.

288
00:08:29,100 --> 00:08:29,734

The hardware is moving

289
00:08:29,734 --> 00:08:31,100
from the factory floor to

290
00:08:31,100 --> 00:08:32,000
the launch pad