1
00:00:06,550 --> 00:00:04,630
hi welcome to the neutral buoyancy

2
00:00:08,390 --> 00:00:06,560
laboratory at johnson space center or

3
00:00:10,709 --> 00:00:08,400
really close to it where we are doing

4
00:00:12,070 --> 00:00:10,719
some work today with the orion program

5
00:00:14,870 --> 00:00:12,080
that's our new spaceship that's going to

6
00:00:16,310 --> 00:00:14,880
take humans into space next um and

7
00:00:18,790 --> 00:00:16,320
we're actually working on rescue and

8
00:00:20,710 --> 00:00:18,800
recovery operations this is tom walker

9
00:00:22,150 --> 00:00:20,720
who is the lead for what rescue and

10
00:00:23,429 --> 00:00:22,160
recovery for ryan he's gonna tell us a

11
00:00:24,870 --> 00:00:23,439
little bit about that thanks so much for

12
00:00:27,349 --> 00:00:24,880
joining us sure thanks thank you very

13
00:00:29,830 --> 00:00:27,359

much okay so rescue and recovery why do

14
00:00:32,389 --> 00:00:29,840
what do we need that for orion for orion

15
00:00:34,790 --> 00:00:32,399
um we're gonna do a mission in 2014

16
00:00:36,229 --> 00:00:34,800
called exploration flight test one where

17
00:00:39,190 --> 00:00:36,239
our capsule is going to land off the

18
00:00:40,790 --> 00:00:39,200
coast of uh baja out in the water

19
00:00:41,830 --> 00:00:40,800
so what we need to do is pick the

20
00:00:44,150 --> 00:00:41,840
capsule

21
00:00:45,750 --> 00:00:44,160
out of the water put it on a ship and

22
00:00:47,270 --> 00:00:45,760
bring it back to port

23
00:00:48,790 --> 00:00:47,280
okay and that sounds pretty

24
00:00:51,189 --> 00:00:48,800
straightforward but i guess that's the

25
00:00:53,270 --> 00:00:51,199
recovery operations yeah because that's

26
00:00:56,549 --> 00:00:53,280
an uncrewed flight when we have a crude

27
00:00:58,229 --> 00:00:56,559
mission in 2021 we'll also be looking at

28
00:01:00,389 --> 00:00:58,239
doing uh setting up for rescue

29
00:01:01,990 --> 00:01:00,399
operations so if there's ever a problem

30
00:01:03,590 --> 00:01:02,000
getting to orbit and we landed out in

31
00:01:05,270 --> 00:01:03,600
the atlantic ocean

32
00:01:07,270 --> 00:01:05,280
we'd send rescue forces out to get the

33
00:01:08,950 --> 00:01:07,280
crew out of the vehicle as well okay so

34
00:01:10,789 --> 00:01:08,960
right now we're getting ready for

35
00:01:12,310 --> 00:01:10,799
exploration flight test one that's

36
00:01:14,950 --> 00:01:12,320
coming up in a little over two little

37
00:01:16,789 --> 00:01:14,960
less than two years now that's right so

38
00:01:18,550 --> 00:01:16,799

you know it's two years away what is it

39
00:01:19,910 --> 00:01:18,560
is it hard why are you why are you

40
00:01:23,990 --> 00:01:19,920
starting this now

41
00:01:25,830 --> 00:01:24,000
the way we're going to do recovery on

42
00:01:27,270 --> 00:01:25,840
exploration flight test one is we're

43
00:01:29,670 --> 00:01:27,280
going to have a well-decked ship from

44
00:01:31,990 --> 00:01:29,680
the navy go out to collect this

45
00:01:35,030 --> 00:01:32,000
that ship goes out in the water

46
00:01:37,030 --> 00:01:35,040
it actually lowers a a hatch in the back

47
00:01:39,109 --> 00:01:37,040
and we pull the crew module into that

48
00:01:41,590 --> 00:01:39,119
hatch into a cradle kind of like a boat

49
00:01:44,069 --> 00:01:41,600
trailer that's right so what we're doing

50
00:01:45,910 --> 00:01:44,079
now is we're bringing the navy experts

51
00:01:47,749 --> 00:01:45,920
out and teaching them all the hazards of

52
00:01:50,550 --> 00:01:47,759
the capsule how to interface with the

53
00:01:52,789 --> 00:01:50,560
capsule so we can not only learn how to

54
00:01:53,990 --> 00:01:52,799
recover it teach them how to do it

55
00:01:56,149 --> 00:01:54,000
but also we're building all our

56
00:01:58,310 --> 00:01:56,159
equipment so we're testing out hardware

57
00:02:00,389 --> 00:01:58,320
and stuff to interface with the vehicle

58
00:02:01,670 --> 00:02:00,399
we need time to develop that okay what

59
00:02:02,870 --> 00:02:01,680
kind of things what kind of questions

60
00:02:03,830 --> 00:02:02,880
are you asking what do you have to

61
00:02:07,910 --> 00:02:03,840
consider

62
00:02:09,830 --> 00:02:07,920
ammonia on the vehicle that vents it

63
00:02:11,750 --> 00:02:09,840

landing so we have to teach them where

64
00:02:13,510 --> 00:02:11,760
that danger is and how to stay away from

65
00:02:15,990 --> 00:02:13,520
it there's several areas of the vehicle

66
00:02:17,430 --> 00:02:16,000
that are really really hot at landing so

67
00:02:19,270 --> 00:02:17,440
those are keep out zones that we don't

68
00:02:21,350 --> 00:02:19,280
want them

69
00:02:23,350 --> 00:02:21,360
getting around

70
00:02:24,949 --> 00:02:23,360
there's also to get the

71
00:02:26,470 --> 00:02:24,959
crew module into the vehicle there's

72
00:02:27,910 --> 00:02:26,480
attach points on the vehicle three of

73
00:02:29,750 --> 00:02:27,920
them so we're teaching them how to hook

74
00:02:32,309 --> 00:02:29,760
into that those attach points so we can

75
00:02:33,670 --> 00:02:32,319
pull the capsule into the vehicle okay

76
00:02:35,430 --> 00:02:33,680
so we're also developing what's the best

77
00:02:37,030 --> 00:02:35,440
hardware to do that

78
00:02:39,750 --> 00:02:37,040
and this training development that we're

79
00:02:41,509 --> 00:02:39,760
doing now is all set up for next summer

80
00:02:43,030 --> 00:02:41,519
we're going to go to norfolk we're going

81
00:02:45,110 --> 00:02:43,040
to get together with the ship's crew and

82
00:02:46,790 --> 00:02:45,120
a ship out in the heart in the port out

83
00:02:48,949 --> 00:02:46,800
there and we're going to take a capsule

84
00:02:50,550 --> 00:02:48,959
like we have back there out into the

85
00:02:52,470 --> 00:02:50,560
chesapeake bay and we're actually going

86
00:02:53,830 --> 00:02:52,480
to do a practice recovery of it okay so

87
00:02:55,350 --> 00:02:53,840
that's what all this today is leading

88
00:02:57,110 --> 00:02:55,360

towards this is almost the practice for

89
00:02:59,589 --> 00:02:57,120
the practice this is a practice in a

90
00:03:01,110 --> 00:02:59,599
nice calm environment before we go out

91
00:03:03,509 --> 00:03:01,120
and do it in a bay

92
00:03:06,869 --> 00:03:03,519
and then in january of

93
00:03:08,470 --> 00:03:06,879
2014 we're gonna go off san diego we're

94
00:03:10,309 --> 00:03:08,480
gonna take a capsule just like that

95
00:03:12,390 --> 00:03:10,319
we're gonna take it out into the ocean

96
00:03:13,990 --> 00:03:12,400
and do a practice recovery so we can do

97
00:03:16,070 --> 00:03:14,000
it in a real environment just like we'd

98
00:03:18,869 --> 00:03:16,080
see for uh exploration flight just one

99
00:03:20,470 --> 00:03:18,879
okay um so i guess

100
00:03:21,910 --> 00:03:20,480
orion's landing in water that's why

101
00:03:24,070 --> 00:03:21,920
we're doing all this and that saves us

102
00:03:25,990 --> 00:03:24,080
some weight right that's right we back

103
00:03:28,149 --> 00:03:26,000
in the design phase that saves us about

104
00:03:29,430 --> 00:03:28,159
1500 pounds of mass that's very

105
00:03:31,589 --> 00:03:29,440
important to get that off there because

106
00:03:32,710 --> 00:03:31,599
we need to be as light as possible since

107
00:03:35,030 --> 00:03:32,720
we're going to go all the way out to the

108
00:03:37,750 --> 00:03:35,040
moon and beyond okay and does it make it

109
00:03:39,670 --> 00:03:37,760
easier or harder to to recover it in in

110
00:03:41,509 --> 00:03:39,680
the water it's actually just a little

111
00:03:42,630 --> 00:03:41,519
bit harder to recover in the water on

112
00:03:43,830 --> 00:03:42,640
the land it's something you can just

113
00:03:45,270 --> 00:03:43,840

walk up to

114
00:03:47,910 --> 00:03:45,280
and it's you don't have to have like a

115
00:03:49,990 --> 00:03:47,920
ship out there and stuff so it is it is

116
00:03:50,630 --> 00:03:50,000
a little bit easier on land to recover

117
00:03:53,110 --> 00:03:50,640
it

118
00:03:55,030 --> 00:03:53,120
there's advantages to water

119
00:03:57,270 --> 00:03:55,040
most all the chemicals that we have on

120
00:03:58,869 --> 00:03:57,280
board they're water soluble so the water

121
00:04:00,869 --> 00:03:58,879
actually helps with the

122
00:04:02,869 --> 00:04:00,879
the chemicals we have onboard that okay

123
00:04:05,270 --> 00:04:02,879
that's interesting i guess we see we see

124
00:04:07,110 --> 00:04:05,280
landing land landings with the soyuz a

125
00:04:08,630 --> 00:04:07,120
lot so we're kind of used to that but of

126
00:04:11,030 --> 00:04:08,640
course we've seen water landings too

127
00:04:12,789 --> 00:04:11,040
that's how apollo landed and so we have

128
00:04:13,750 --> 00:04:12,799
experience there but and take it this is

129
00:04:15,750 --> 00:04:13,760
a little different than what we've done

130
00:04:17,349 --> 00:04:15,760
in the past yes this is this capsule

131
00:04:19,110 --> 00:04:17,359
here is a lot bigger than the soyuz it's

132
00:04:20,310 --> 00:04:19,120
a lot bigger than the apollo right so

133
00:04:22,629 --> 00:04:20,320
the landing systems were going to be

134
00:04:24,469 --> 00:04:22,639
really heavy to get it to land on land

135
00:04:26,230 --> 00:04:24,479
and since we always protect for aborts

136
00:04:27,670 --> 00:04:26,240
with the crew on board we're always

137
00:04:28,790 --> 00:04:27,680
going to have to land in the water so no

138
00:04:30,629 --> 00:04:28,800

matter what we're going to have to

139
00:04:32,710 --> 00:04:30,639
design a system that worked in the water

140
00:04:34,230 --> 00:04:32,720
okay that makes sense well thanks so

141
00:04:35,670 --> 00:04:34,240
much for talking with us and how's the

142
00:04:37,030 --> 00:04:35,680
testing going so far it's going very

143
00:04:39,110 --> 00:04:37,040
well we're learning a whole lot this

144
00:04:40,710 --> 00:04:39,120
week all right we'll be back

145
00:04:42,870 --> 00:04:40,720
at the end of january to go through some

146
00:04:44,550 --> 00:04:42,880
other techniques some contingency

147
00:04:45,670 --> 00:04:44,560
operations as well okay and we're going

148
00:04:47,110 --> 00:04:45,680
to talk with somebody else who's working

149
00:04:49,110 --> 00:04:47,120
on the test a little later in the hour