



1
00:00:05,150 --> 00:00:03,139
when NASA Space Shuttle was designed as

2
00:00:08,089 --> 00:00:05,160
a reusable vehicle more than 30 years

3
00:00:10,910 --> 00:00:08,099
ago the spacecraft was not the only part

4
00:00:12,860 --> 00:00:10,920
of the high-tech recyclable system the

5
00:00:14,539 --> 00:00:12,870
twin solid rocket boosters that helped

6
00:00:16,910 --> 00:00:14,549
power the shuttles have sent to space

7
00:00:20,090 --> 00:00:16,920
have been refurbished and used multiple

8
00:00:22,160 --> 00:00:20,100
times during the shuttle program but to

9
00:00:23,990 --> 00:00:22,170
do that they had to be retrieved from

10
00:00:27,740 --> 00:00:24,000
the Atlantic Ocean after each launch

11
00:00:30,349 --> 00:00:27,750
after burnout the spent boosters tumble

12
00:00:32,889 --> 00:00:30,359
earthwork for about 45 miles before

13
00:00:36,740 --> 00:00:32,899

parachuting final few miles to the water

14

00:00:39,110 --> 00:00:36,750

the job of retrieving these 149 footlong

15

00:00:41,840 --> 00:00:39,120

boosters has fallen to an elite team of

16

00:00:45,080 --> 00:00:41,850

divers aboard the NASA vessels Liberty

17

00:00:47,090 --> 00:00:45,090

star and freedom star these ships were

18

00:00:49,940 --> 00:00:47,100

designed specifically for the test of

19

00:00:52,580 --> 00:00:49,950

booster recovery each ship carries a

20

00:00:56,029 --> 00:00:52,590

crew of 10 and an additional 10 member

21

00:00:58,490 --> 00:00:56,039

dive team about 24 hours before each

22

00:01:00,290 --> 00:00:58,500

launch the two ships set out to sea from

23

00:01:02,630 --> 00:01:00,300

Port Canaveral on Florida's east coast

24

00:01:05,960 --> 00:01:02,640

to be stationed near the zone where the

25

00:01:09,560 --> 00:01:05,970

Boosters will fall we will plan to

26
00:01:12,260 --> 00:01:09,570
arrive on station about four hours

27
00:01:14,840 --> 00:01:12,270
before launch and we have to get there

28
00:01:18,469 --> 00:01:14,850
before that so that we can clear the

29
00:01:21,800 --> 00:01:18,479
area there's a box that we have to keep

30
00:01:24,890 --> 00:01:21,810
clear of ships that's close to the

31
00:01:27,109 --> 00:01:24,900
impact area but the divers go to work

32
00:01:30,109 --> 00:01:27,119
long before the retrieval even begins

33
00:01:32,870 --> 00:01:30,119
prior to launch we will have all of the

34
00:01:35,030 --> 00:01:32,880
dive gear ready all of our camera gear

35
00:01:38,420 --> 00:01:35,040
ready all the retrieval equipment ready

36
00:01:41,450 --> 00:01:38,430
to go the booster recovery is unlike any

37
00:01:44,120 --> 00:01:41,460
other diving job the divers operate the

38
00:01:46,910 --> 00:01:44,130

cranes they operate the small boats they

39

00:01:48,710 --> 00:01:46,920

operate the reels they're the diver

40

00:01:49,910 --> 00:01:48,720

medics that operate the recompression

41

00:01:52,249 --> 00:01:49,920

chamber

42

00:01:54,109 --> 00:01:52,259

you know they fill the tanks leave the

43

00:01:56,230 --> 00:01:54,119

dives they do the diving I mean it's

44

00:01:58,420 --> 00:01:56,240

everybody is doing everything

45

00:02:00,490 --> 00:01:58,430

from their vantage point in the Atlantic

46

00:02:02,469 --> 00:02:00,500

the team is able to spot the Boosters

47

00:02:04,719 --> 00:02:02,479

after they fall away from the ascending

48

00:02:07,960 --> 00:02:04,729

shuttle and that's when they spring into

49

00:02:11,290 --> 00:02:07,970

action we are not allowed in until after

50

00:02:13,809 --> 00:02:11,300

it's cleared so the Boosters land and we

51
00:02:15,790 --> 00:02:13,819
could be anywhere from 10 to 20 miles

52
00:02:18,400 --> 00:02:15,800
away from the boosters it can take us

53
00:02:20,830 --> 00:02:18,410
about an hour to get to the boosters and

54
00:02:23,199 --> 00:02:20,840
where we are before beginning the

55
00:02:26,199 --> 00:02:23,209
retrieval process the team conducts a

56
00:02:28,930 --> 00:02:26,209
complete visual inspection using still

57
00:02:31,060 --> 00:02:28,940
and video photography imagery of any

58
00:02:34,060 --> 00:02:31,070
areas of concern can be sent back to

59
00:02:36,400 --> 00:02:34,070
shore for analysis once the inspection

60
00:02:39,100 --> 00:02:36,410
is complete the divers begin the

61
00:02:41,500 --> 00:02:39,110
recovery first recovered are the

62
00:02:44,259 --> 00:02:41,510
parachutes which are also recycled for

63
00:02:46,330 --> 00:02:44,269

future flights then the frustum and

64

00:02:49,120 --> 00:02:46,340

drogue chutes are recovered and brought

65

00:02:52,000 --> 00:02:49,130

on board the ship's the next operation

66

00:02:56,020 --> 00:02:52,010

would be to launch the diver operated

67

00:02:58,900 --> 00:02:56,030

plug which is about 1,400 pounds so it's

68

00:03:01,930 --> 00:02:58,910

not unusual for us to have seven divers

69

00:03:05,470 --> 00:03:01,940

on that dive to put the plug in so we

70

00:03:08,710 --> 00:03:05,480

dive it down attach inch-and-a-half

71

00:03:10,479 --> 00:03:08,720

air line to that and start blowing air

72

00:03:13,600 --> 00:03:10,489

into the booster that forces the water

73

00:03:15,370 --> 00:03:13,610

out of the booster and the booster rises

74

00:03:19,420 --> 00:03:15,380

up out of the water and falls over on

75

00:03:23,819 --> 00:03:19,430

its side we attach an inch and a half

76

00:03:26,860 --> 00:03:23,829

steel cable once it's in the water and

77

00:03:28,569 --> 00:03:26,870

proceed to tow it back to port the

78

00:03:30,910 --> 00:03:28,579

highly practiced procedure doesn't

79

00:03:32,710 --> 00:03:30,920

always go as planned with the ships and

80

00:03:36,699 --> 00:03:32,720

divers up against weather and sea

81

00:03:40,150 --> 00:03:36,709

conditions the roughest mission was

82

00:03:42,640 --> 00:03:40,160

probably SPF 63 the conditions were so

83

00:03:47,160 --> 00:03:42,650

bad that the boosters were badly damaged

84

00:03:50,170 --> 00:03:47,170

the nozzles were broken loose the

85

00:03:52,390 --> 00:03:50,180

forward skirts were damaged and in fact

86

00:03:54,910 --> 00:03:52,400

one of them fell off on the way back in

87

00:03:56,920 --> 00:03:54,920

the conditions were so bad that for many

88

00:03:59,560 --> 00:03:56,930

many days we couldn't even attempt the

89

00:04:01,890 --> 00:03:59,570

recovery these skilled teams of divers

90

00:04:04,420 --> 00:04:01,900

aboard the freedom star and Liberty star

91

00:04:06,800 --> 00:04:04,430

completed their last booster recovery

92

00:04:09,589 --> 00:04:06,810

following the launch of atlantis on the

93

00:04:12,949 --> 00:04:09,599

ts 1:35 mission as the space shuttle

94

00:04:14,059 --> 00:04:12,959

program draws to a close what might have

95

00:04:17,270 --> 00:04:14,069

been on their minds

96

00:04:21,020 --> 00:04:17,280

during that final dive in York so busy

97

00:04:23,300 --> 00:04:21,030

doing the job and you know trying to

98

00:04:25,310 --> 00:04:23,310

make sure that the job is done correctly

99

00:04:27,800 --> 00:04:25,320

and that everybody gets home safely that

100

00:04:30,260 --> 00:04:27,810

you don't really have time to think

