



1
00:00:10,070 --> 00:00:07,550
it's about space technology the space

2
00:00:12,860 --> 00:00:10,080
technology Mission Directorate pushes us

3
00:00:15,620 --> 00:00:12,870
to develop technologies that make NASA

4
00:00:19,070 --> 00:00:15,630
missions more affordable more capable

5
00:00:21,429 --> 00:00:19,080
and more reliable this is a critical

6
00:00:24,800 --> 00:00:21,439
milestone for our composite cryotank

7
00:00:26,560 --> 00:00:24,810
project with the arrival of the tank

8
00:00:30,169 --> 00:00:26,570
here at Marshall Space Flight Center

9
00:00:33,459 --> 00:00:30,179
this is a culmination of about two and a

10
00:00:37,880 --> 00:00:33,469
half years of work for the project that

11
00:00:41,440 --> 00:00:37,890
included many many more than three

12
00:00:43,819 --> 00:00:41,450
thousand coupon and subscale

13
00:00:47,420 --> 00:00:43,829

manufacturing demonstration tests as

14

00:00:50,810 --> 00:00:47,430

well as a half scale two point four

15

00:00:52,939 --> 00:00:50,820

meter eight-foot tank that we tested

16

00:00:55,729 --> 00:00:52,949

here last year this is a team that

17

00:00:57,619 --> 00:00:55,739

consisted of NASA and Boeing we wanted

18

00:00:59,869 --> 00:00:57,629

to contract to Boeing to actually

19

00:01:02,360 --> 00:00:59,879

manufacture the tank but it was a team

20

00:01:04,460 --> 00:01:02,370

effort it was a really good team we had

21

00:01:07,609 --> 00:01:04,470

a really good work between the center's

22

00:01:09,710 --> 00:01:07,619

and we actually there was a lot of

23

00:01:11,750 --> 00:01:09,720

interaction between Boeing and NASA one

24

00:01:14,450 --> 00:01:11,760

just an asset I mean a Boeing built tank

25

00:01:16,160 --> 00:01:14,460

it was a collaboration between all

26

00:01:18,109 --> 00:01:16,170

parties well another thing I

27

00:01:20,120 --> 00:01:18,119

particularly enjoyed about this program

28

00:01:22,460 --> 00:01:20,130

was the interaction with the NASA people

29

00:01:24,080 --> 00:01:22,470

we had NASA people down for every

30

00:01:27,260 --> 00:01:24,090

critical critical phase of the

31

00:01:29,420 --> 00:01:27,270

manufacturer and not only giving us

32

00:01:31,219 --> 00:01:29,430

advice in helping to mature the

33

00:01:33,590 --> 00:01:31,229

technology but doing hands-on

34

00:01:36,380 --> 00:01:33,600

fabrication so to design and manufacture

35

00:01:38,929 --> 00:01:36,390

this tank we use new materials we

36

00:01:41,090 --> 00:01:38,939

process the tank by automated fiber

37

00:01:42,830 --> 00:01:41,100

replacement the benefit of that is we

38

00:01:45,830 --> 00:01:42,840

can lay down the material quickly which

39

00:01:48,289 --> 00:01:45,840

provides us a low cost operation and a

40

00:01:50,359 --> 00:01:48,299

very lightweight tank we've worked on

41

00:01:51,889 --> 00:01:50,369

this program for twenty nine months and

42

00:01:55,520 --> 00:01:51,899

when we started we'd never built a tank

43

00:01:58,749 --> 00:01:55,530

of this size by the methods that we did

44

00:02:02,120 --> 00:01:58,759

we did automated fiber placement

45

00:02:04,520 --> 00:02:02,130

included Corps of just developing the

46

00:02:06,200 --> 00:02:04,530

robotic v replacement equipment and way

47

00:02:08,630 --> 00:02:06,210

to make the skirt in one piece was a

48

00:02:11,059 --> 00:02:08,640

large challenge the composite tank that

49

00:02:12,360 --> 00:02:11,069

we have here today is the largest ever

50

00:02:14,820 --> 00:02:12,370

of its kind

51
00:02:17,880 --> 00:02:14,830
it's one of the largest composite tanks

52
00:02:22,680 --> 00:02:17,890
ever manufactured the tank is larger

53
00:02:24,449 --> 00:02:22,690
than most launch vehicle tanks today we

54
00:02:25,290 --> 00:02:24,459
looked at testing the tank elsewhere in

55
00:02:27,300 --> 00:02:25,300
the country

56
00:02:30,930 --> 00:02:27,310
we we surveyed a lot of different places

57
00:02:32,910 --> 00:02:30,940
and Marshall had the best mix of

58
00:02:36,210 --> 00:02:32,920
available capabilities to pull this job

59
00:02:38,130 --> 00:02:36,220
off and so everywhere from moving around

60
00:02:39,750 --> 00:02:38,140
the center to processing it to applying

61
00:02:41,460 --> 00:02:39,760
the structural loads it's not a lot of

62
00:02:43,350 --> 00:02:41,470
places in the US that can test something

63
00:02:46,500 --> 00:02:43,360

of this scale the load is what's

64

00:02:48,390 --> 00:02:46,510

imparted to simulate launch condition so

65

00:02:50,850 --> 00:02:48,400

you've got a rocket and it's it's it's

66

00:02:52,380 --> 00:02:50,860

going up you get a compressive line load

67

00:02:55,050 --> 00:02:52,390

and so that's what we're going to do

68

00:02:58,320 --> 00:02:55,060

with this ground test article is apply a

69

00:02:59,460 --> 00:02:58,330

representative compressive force which

70

00:03:02,009 --> 00:02:59,470

would be similar to what it would see

71

00:03:05,130 --> 00:03:02,019

there during launch our composite tank

72

00:03:07,370 --> 00:03:05,140

it's designed to be 30% lighter than the

73

00:03:10,970 --> 00:03:07,380

state-of-the-art and at the same time

74

00:03:14,699 --> 00:03:10,980

25% less costly we're performing this

75

00:03:17,160 --> 00:03:14,709

composite tank technology development

76

00:03:19,680 --> 00:03:17,170

for a number of stakeholders first to

77

00:03:22,050 --> 00:03:19,690

meet our NASA needs we need to reduce

78

00:03:23,550 --> 00:03:22,060

the weight of our launch vehicles today

79

00:03:25,650 --> 00:03:23,560

but there are many many other

80

00:03:27,599 --> 00:03:25,660

stakeholders the Department of Defense

81

00:03:30,599 --> 00:03:27,609

for example for their launch vehicles

82

00:03:33,270 --> 00:03:30,609

and then other customers in the

83

00:03:35,280 --> 00:03:33,280

commercial arena as well the NASA space

84

00:03:39,479 --> 00:03:35,290

technology Mission Directorate is

85

00:03:42,740 --> 00:03:39,489

setting out to take on high risk high

86

00:03:45,690 --> 00:03:42,750

payoff technologies things that will be

87

00:03:48,509 --> 00:03:45,700

transformative in how vehicle programs

88

00:03:51,860 --> 00:03:48,519

will achieve their future missions being

89

00:03:55,349 --> 00:03:51,870

able to prove out that we can design

90

00:03:57,690 --> 00:03:55,359

build and contain liquid hydrogen with

91

00:03:59,699 --> 00:03:57,700

only using composites would be a

92

00:04:02,940 --> 00:03:59,709

significant breakthrough it's all about

93

00:04:04,770 --> 00:04:02,950

technology if you don't develop

94

00:04:07,020 --> 00:04:04,780

technologies for the future you won't

95

00:04:10,020 --> 00:04:07,030

you won't go where you want to go so so

96

00:04:11,729 --> 00:04:10,030

it composites will decrease the weight

97

00:04:13,440 --> 00:04:11,739

of the tanks it will increase the

98

00:04:15,000 --> 00:04:13,450

payload performance of the launch

99

00:04:17,340 --> 00:04:15,010

vehicle it'll give us