1
00:00:23,729 --> 00:00:21,120
I'm Lori Meggs and I'm bill hubscher

2
00:00:24,960 --> 00:00:23,739
welcome to focus on Marshall today we're

3
00:00:26,700 --> 00:00:24,970
going to visit a couple of lads that

4
00:00:28,139 --> 00:00:26,710
have been pretty busy lately that's why

5
00:00:29,519 --> 00:00:28,149
they've been doing a lot in the support

6
00:00:33,829 --> 00:00:29,529
of the return to flight effort so let's

7
00:00:37,649 --> 00:00:36,060
we're out of the instrument and payload

8
00:00:39,540 --> 00:00:37,659
systems department offices and we're

9
00:00:41,160 --> 00:00:39,550
joined by Patrick McManus Patrick first

10
00:00:42,990 --> 00:00:41,170
of all tell us specifically what branch

11
00:00:45,000 --> 00:00:43,000
remember of where a member of the parts

12
00:00:48,600 --> 00:00:45,010
packaging fabrication branch and

13
00:00:50,580 --> 00:00:48,610

specifically we are in charge of Tripoli

14
00:00:52,410 --> 00:00:50,590
parts engineering and analysis for

15
00:00:54,090 --> 00:00:52,420
Marshall Space Flight Center projects

16
00:00:56,759 --> 00:00:54,100
tell us a little bit more about what

17
00:00:59,970 --> 00:00:56,769
your team does we actually qualified

18
00:01:03,509 --> 00:00:59,980
parts for Space Flight views and we also

19
00:01:05,550 --> 00:01:03,519
be on the analytical side we perform

20
00:01:08,370 --> 00:01:05,560
failure analysis of Tripoli parts and

21
00:01:10,620 --> 00:01:08,380
also touchscreen carts for Space Flight

22
00:01:13,710 --> 00:01:10,630
use any good some labs here as well

23
00:01:15,919 --> 00:01:13,720
right right we do all the tools we need

24
00:01:19,200 --> 00:01:15,929
for failure analysis they include

25
00:01:22,380 --> 00:01:19,210
environmental scanning electron

26
00:01:25,260 --> 00:01:22,390
microscopy we have all like optics

27
00:01:26,850 --> 00:01:25,270
microscopy lavatory we have a cross

28
00:01:32,520 --> 00:01:26,860
section in laboratory for metallography

29
00:01:34,800 --> 00:01:32,530
we also do real-time radiography and we

30
00:01:38,700 --> 00:01:34,810
also do Fourier transform infrared

31
00:01:40,889 --> 00:01:38,710
spectroscopy can we take a look yes are

32
00:01:44,010 --> 00:01:40,899
those two enhanced capabilities that we

33
00:01:47,219 --> 00:01:44,020
recently were able to procure and one of

34
00:01:48,929 --> 00:01:47,229
them's the Phoenix Madame X the

35
00:01:50,700 --> 00:01:48,939
real-time radiography system and the

36
00:01:52,649 --> 00:01:50,710
other is the environmental scanning

37
00:01:53,910 --> 00:01:52,659
electron microscope so which one you're

38
00:01:56,190 --> 00:01:53,920

gonna look at first we're going to look

39
00:01:58,800 --> 00:01:56,200
at the Phoenix nano max radiography

40
00:02:00,630 --> 00:01:58,810
system ok let's it over there how did

41
00:02:02,069 --> 00:02:00,640
the real-time radiography lab with Terry

42
00:02:03,810 --> 00:02:02,079
Roland Terry thanks for being with us to

43
00:02:05,730 --> 00:02:03,820
display Lori tell me about what you're

44
00:02:07,649 --> 00:02:05,740
doing here a whip phone triple-a parts

45
00:02:09,240 --> 00:02:07,659
failure analysis for Marshall Space

46
00:02:10,830 --> 00:02:09,250
Flight Center and this is the latest

47
00:02:13,140 --> 00:02:10,840
piece of equipment that we have to help

48
00:02:15,660 --> 00:02:13,150
us accomplish that it's made by Phoenix

49
00:02:17,400 --> 00:02:15,670
and it's a nano focus x-ray machine this

50
00:02:19,259 --> 00:02:17,410
is a world-class machine there's only a

51
00:02:21,720 --> 00:02:19,269
few of these things located throughout

52
00:02:22,540 --> 00:02:21,730
the world so two unique capability that

53
00:02:24,310 --> 00:02:22,550
we have to help

54
00:02:26,020 --> 00:02:24,320
perform failure analysis some different

55
00:02:28,420 --> 00:02:26,030
types of parts what we have on the

56
00:02:30,700 --> 00:02:28,430
inside here is an engine cutoff sensor

57
00:02:32,020 --> 00:02:30,710
is called an eco sensor and it's one of

58
00:02:34,540 --> 00:02:32,030
the things that's called the shuttle to

59
00:02:36,070 --> 00:02:34,550
be show launched piece crowed and so

60
00:02:37,060 --> 00:02:36,080
what we'd like to do is we'd like to

61
00:02:39,070 --> 00:02:37,070
show you what one of these things looks

62
00:02:40,570 --> 00:02:39,080
like on the inside all right you can do

63
00:02:42,580 --> 00:02:40,580

that with this computer right over here

64
00:02:44,380 --> 00:02:42,590
i can really dissect what you're looking

65
00:02:46,240 --> 00:02:44,390
at is he consents that's correct when he

66
00:02:48,340 --> 00:02:46,250
when he turns it's not like I said this

67
00:02:49,870 --> 00:02:48,350
is an x-ray machine so the x rays pass

68
00:02:51,880 --> 00:02:49,880
completely through the material and

69
00:02:54,400 --> 00:02:51,890
different materials have different types

70
00:02:56,130 --> 00:02:54,410
of x-ray densities and so we can look at

71
00:02:58,600 --> 00:02:56,140
this and determine which parts are

72
00:03:00,340 --> 00:02:58,610
different types of what their makeups on

73
00:03:02,710 --> 00:03:00,350
but we can also look for things like

74
00:03:04,600 --> 00:03:02,720
fractures and broken wires and things

75
00:03:06,940 --> 00:03:04,610
like that you can see him kind of

76
00:03:08,380 --> 00:03:06,950
increasing the magnification here and

77
00:03:11,290 --> 00:03:08,390
what he's looking at is something in

78
00:03:13,420 --> 00:03:11,300
this eco sensor that's called a terminal

79
00:03:15,760 --> 00:03:13,430
Salinas what we believe is causing the

80
00:03:19,090 --> 00:03:15,770
problem with these some of these sensors

81
00:03:20,920 --> 00:03:19,100
this sensor is also sitting on what's

82
00:03:23,200 --> 00:03:20,930
called a CNC table it's the computer

83
00:03:25,660 --> 00:03:23,210
numerically controlled table that allows

84
00:03:27,820 --> 00:03:25,670
us to make very precise measurements and

85
00:03:29,320 --> 00:03:27,830
we're going to use this table and future

86
00:03:32,350 --> 00:03:29,330
screenings for sensors that are going to

87
00:03:33,820 --> 00:03:32,360
be put in external tanks so a lot of

88
00:03:35,590 --> 00:03:33,830

return to flight work going on in this

89
00:03:37,030 --> 00:03:35,600
lab and you also have another lap you

90
00:03:38,770 --> 00:03:37,040
want to sorry we have a scanning

91
00:03:41,440 --> 00:03:38,780
electron microscopy lab I like to show

92
00:03:42,940 --> 00:03:41,450
you all right let's check it out now

93
00:03:44,620 --> 00:03:42,950
we've moved across the hall to another

94
00:03:46,810 --> 00:03:44,630
lab and Terry joins us tell us about

95
00:03:48,520 --> 00:03:46,820
this machine yeah we're in the lot

96
00:03:50,590 --> 00:03:48,530
optics and scanning electron microscopy

97
00:03:52,900 --> 00:03:50,600
lab and this is another piece of

98
00:03:54,760 --> 00:03:52,910
equipment that we have that's new here

99
00:03:56,229 --> 00:03:54,770
to do failure analysis with it's called

100
00:03:58,240 --> 00:03:56,239
an environmental scanning electron

101
00:03:59,320 --> 00:03:58,250
microscope and it's the latest we have

102
00:04:02,260 --> 00:03:59,330
in a non-destructive evaluation

103
00:04:05,050 --> 00:04:02,270
techniques with old electron microscopy

104
00:04:06,790 --> 00:04:05,060
you had to go coke samples and that tend

105
00:04:08,140 --> 00:04:06,800
to change the characteristics of your

106
00:04:10,540 --> 00:04:08,150
sample because you always had to shoot

107
00:04:13,060 --> 00:04:10,550
through the gold now with this new type

108
00:04:14,680 --> 00:04:13,070
of machine we can actually put samples

109
00:04:16,479 --> 00:04:14,690
in there that are even wet without

110
00:04:17,470 --> 00:04:16,489
having any trouble of charging or

111
00:04:19,000 --> 00:04:17,480
anything like that so this is a

112
00:04:21,250 --> 00:04:19,010
non-destructive technique we can put a

113
00:04:22,750 --> 00:04:21,260

sample in there take it out load it back

114
00:04:24,220 --> 00:04:22,760
into whatever it was and they'll behave

115
00:04:25,000 --> 00:04:24,230
just like it did before you put it in

116
00:04:26,380 --> 00:04:25,010
there

117
00:04:28,270 --> 00:04:26,390
great thanks Terry let's take a quick

118
00:04:30,790 --> 00:04:28,280
look now at what's inside what's Abrams

119
00:04:32,110 --> 00:04:30,800
is sitting at the controls Russ tell us

120
00:04:34,600 --> 00:04:32,120
what we've got inside the microscope

121
00:04:36,850 --> 00:04:34,610
this is an eco sensor terminal post

122
00:04:39,280 --> 00:04:36,860
assembly it's at about 65 x

123
00:04:40,900 --> 00:04:39,290
magnification let me take it in about

124
00:04:44,050 --> 00:04:40,910
seven hundred or so we'll see what it

125
00:04:45,660 --> 00:04:44,060
looks like so you can get really tight

126
00:04:47,800 --> 00:04:45,670
with us in there and look at the

127
00:04:49,060 --> 00:04:47,810
markings on the post to see what

128
00:04:51,490 --> 00:04:49,070
happened to it when it was being

129
00:04:53,230 --> 00:04:51,500
assembled so here we can see that the

130
00:04:55,330 --> 00:04:53,240
tight picture of the sensor what's our

131
00:04:57,430 --> 00:04:55,340
on this side it's an elemental analysis

132
00:05:00,070 --> 00:04:57,440
that can tell us exactly what materials

133
00:05:01,630 --> 00:05:00,080
this the sensor is made from so not only

134
00:05:04,600 --> 00:05:01,640
you get an up-close picture but you can

135
00:05:06,330 --> 00:05:04,610
actually tell what metals etc the actual