1
00:00:00,000 --> 00:00:03,771
Designing and building the Heavy

2
00:00:03,806 --> 00:00:05,668
lift Space Launch System is our

3
00:00:05,703 --> 00:00:08,924
focus and top priority. SLS will

4
00:00:08,959 --> 00:00:10,939
expand human presence beyond Low

5
00:00:10,974 --> 00:00:12,460
Earth Orbit and it’s going to

6
00:00:12,495 --> 00:00:13,860
enable us to do new missions of

7
00:00:13,895 --> 00:00:15,341
exploration across the solar

8
00:00:15,376 --> 00:00:17,476
system. This represents to us an

9
00:00:17,511 --> 00:00:19,251
enormous opportunity for the

10
00:00:19,286 --> 00:00:21,796
entire NASA industry team and

11
00:00:21,831 --> 00:00:23,148
we are moving forward in a very

12
00:00:23,183 --> 00:00:24,996
different manner. Understanding

13
00:00:25,031 --> 00:00:26,708

the economic pressures that our

14
00:00:26,743 --> 00:00:28,308
nation is under we set very tight

15
00:00:28,343 --> 00:00:30,132
budget targets and will live

16
00:00:30,167 --> 00:00:31,668
within them. Therefore we have

17
00:00:31,703 --> 00:00:33,435
accepted the reality that we

18
00:00:33,470 --> 00:00:35,003
must embrace change rather than

19
00:00:35,038 --> 00:00:36,604
avoid it. We are embracing

20
00:00:36,639 --> 00:00:38,619
innovation both technically and

21
00:00:38,654 --> 00:00:40,228
in our management processes in

22
00:00:40,263 --> 00:00:41,764
order to be successful in these

23
00:00:41,799 --> 00:00:43,716
constrained budget environments.

24
00:00:43,751 --> 00:00:45,148
Knowing the fiscal realities

25
00:00:45,183 --> 00:00:47,061
NASA engaged our booster prime

26
00:00:47,096 --> 00:00:49,133
contractor ATK to look for ways

27
00:00:49,168 --> 00:00:51,516
to deliver a much more affordable

28
00:00:51,551 --> 00:00:53,595
product. They have embraced a

29
00:00:53,630 --> 00:00:55,132
process called Value Stream

30
00:00:55,167 --> 00:00:56,980
Mapping. Thus far they have

31
00:00:57,015 --> 00:00:59,196
identified over 400 candidate

32
00:00:59,231 --> 00:01:01,340
changes representing millions

33
00:01:01,375 --> 00:01:03,453
of dollars per flight sets in

34
00:01:03,488 --> 00:01:05,891
savings. As a matter of fact

35
00:01:05,926 --> 00:01:07,124
through the use of modern

36
00:01:07,159 --> 00:01:08,436
techniques and technologies

37
00:01:08,471 --> 00:01:09,844
we have been able to streamline

38
00:01:09,879 --> 00:01:11,884

processes and enhance the

39
00:01:11,919 --> 00:01:13,588
reliability and quality of the

40
00:01:13,623 --> 00:01:16,348
product. We are making progress

41
00:01:16,383 --> 00:01:17,877
in driving down costs,

42
00:01:17,912 --> 00:01:19,421
streamlining processes and

43
00:01:19,456 --> 00:01:20,779
managing risk by embracing

44
00:01:20,814 --> 00:01:22,556
innovation and prudent planning.

45
00:01:22,591 --> 00:01:24,732
Our shared goal is to deliver a

46
00:01:24,767 --> 00:01:26,540
safe, affordable and sustainable

47
00:01:26,575 --> 00:01:29,348
launch vehicle. In the next few

48
00:01:29,383 --> 00:01:30,684
moments we would like to share

49
00:01:30,719 --> 00:01:31,916
with you some more of the details

50
00:01:31,951 --> 00:01:33,205
of how we are approaching this

51
00:01:33,240 --> 00:01:34,460
endeavor.

52
00:01:34,495 --> 00:01:36,340
When we started the value stream

53
00:01:36,375 --> 00:01:37,692
mapping initiative, we pulled

54
00:01:37,727 --> 00:01:39,155
together multiple cross functional

55
00:01:39,190 --> 00:01:40,556
teams and challenged them with

56
00:01:40,591 --> 00:01:42,044
very aggressive reduction targets

57
00:01:42,079 --> 00:01:43,156
that forced them to think

58
00:01:43,191 --> 00:01:44,724
differently. We wanted the teams

59
00:01:44,759 --> 00:01:46,381
to use their experience to do a

60
00:01:46,416 --> 00:01:47,660
deep-dive and evaluate the

61
00:01:47,695 --> 00:01:49,180
individual processes end-to-end

62
00:01:49,215 --> 00:01:51,445
with a fresh prospective. We

63
00:01:51,480 --> 00:01:52,476

asked them to identify their

64
00:01:52,511 --> 00:01:53,731
waste in each process and propose

65
00:01:53,766 --> 00:01:55,540
ideas on how we can produce the

66
00:01:55,575 --> 00:01:57,076
same great product yet more

67
00:01:57,111 --> 00:01:58,220
affordably.

68
00:01:58,255 --> 00:01:59,460
The team started by identifying

69
00:01:59,495 --> 00:02:01,196
the current condition. No computers

70
00:02:01,231 --> 00:02:02,707
were used. This was done visually,

71
00:02:02,742 --> 00:02:04,588
with arrows, post-it notes and

72
00:02:04,623 --> 00:02:06,492
hand drawn icons on a wall, to

73
00:02:06,527 --> 00:02:08,092
help in detailing the processes.

74
00:02:08,127 --> 00:02:10,116
The value stream map process has

75
00:02:10,151 --> 00:02:12,268
given me the opportunity to share

76
00:02:12,303 --> 00:02:13,796
my ideas as we've gone through

77
00:02:13,831 --> 00:02:16,692
and put the process up on the wall.

78
00:02:16,727 --> 00:02:18,476
Everybody's been able to give their

79
00:02:18,511 --> 00:02:20,861
input and really show where we can

80
00:02:20,896 --> 00:02:22,541
make an improvement and it's really

81
00:02:22,576 --> 00:02:25,540
exciting to see it move forward.

82
00:02:25,575 --> 00:02:27,076
As the team worked together over

83
00:02:27,111 --> 00:02:28,324
several months they discovered

84
00:02:28,359 --> 00:02:29,716
many opportunities for improvement.

85
00:02:29,751 --> 00:02:31,068
But it grew into something even

86
00:02:31,103 --> 00:02:32,804
bigger. A movement started to grow.

87
00:02:32,839 --> 00:02:34,660
People started to believe that NASA

88
00:02:34,695 --> 00:02:36,396

and leadership were serious about

89
00:02:36,431 --> 00:02:38,788
change this time. Employees at every

90
00:02:38,823 --> 00:02:40,428
level were providing feedback and

91
00:02:40,463 --> 00:02:41,931
ideas they believed could result

92
00:02:41,966 --> 00:02:43,500
in significant improvements.

93
00:02:43,535 --> 00:02:44,940
You could feel a sense of teamwork

94
00:02:44,975 --> 00:02:46,932
and passion as everybody worked

95
00:02:46,967 --> 00:02:48,307
together to make a difference,

96
00:02:48,342 --> 00:02:49,635
that would result in a positive

97
00:02:49,670 --> 00:02:51,899
change. One example is improvements

98
00:02:51,934 --> 00:02:53,524
in handling, where we looked at

99
00:02:53,559 --> 00:02:55,004
product moves on the product floor

100
00:02:55,039 --> 00:02:56,307
and in between buildings.

101
00:02:56,342 --> 00:02:58,036
The fewer times we transport a

102
00:02:58,071 --> 00:02:59,948
segment, the less chance there is

103
00:02:59,983 --> 00:03:02,428
of something going wrong. The less

104
00:03:02,463 --> 00:03:04,403
we move it, the less it costs.

105
00:03:04,438 --> 00:03:06,523
In one area we had to move a

106
00:03:06,558 --> 00:03:09,036
segment 47 times through

107
00:03:09,071 --> 00:03:11,715
processing. The team identified

108
00:03:11,750 --> 00:03:13,348
ways to reduce the number

109
00:03:13,383 --> 00:03:14,948
of moves to seven.

110
00:03:14,983 --> 00:03:16,756
Another improvement is optimizing

111
00:03:16,791 --> 00:03:18,236
inspection plans to use the

112
00:03:18,271 --> 00:03:19,724
inspection method as best suited

113
00:03:19,759 --> 00:03:21,267

to specific hardware features.

114
00:03:21,302 --> 00:03:23,075
With our new Phased-Array

115
00:03:23,110 --> 00:03:24,844
Ultrasonic system we can inspect

116
00:03:24,879 --> 00:03:26,548
a nozzle right here on

117
00:03:26,583 --> 00:03:28,196
the nozzle floor; which will save

118
00:03:28,231 --> 00:03:30,828
us approximately 80% cycle time.

119
00:03:30,863 --> 00:03:32,244
In some areas, we've identified

120
00:03:32,279 --> 00:03:33,684
steps in our processes that are no

121
00:03:33,719 --> 00:03:35,931
longer needed. For example, a Conscan

122
00:03:35,966 --> 00:03:37,579
inspection to check the surface of

123
00:03:37,614 --> 00:03:39,619
each case prior to bonding insulation

124
00:03:39,654 --> 00:03:41,356
to the steel. With the use of new

125
00:03:41,391 --> 00:03:42,812
insulation materials and ultraviolet

126
00:03:42,847 --> 00:03:44,259
inspection we determined this

127
00:03:44,294 --> 00:03:46,100
inspection was not value added.

128
00:03:46,135 --> 00:03:48,132
The value stream change that we made

129
00:03:48,167 --> 00:03:50,172
was to illuminate the Conscan process.

130
00:03:50,207 --> 00:03:52,627
By doing that we reduced the

131
00:03:52,662 --> 00:03:55,428
cycle time by 85 hours for every motor.

132
00:03:55,463 --> 00:03:59,172
And per year we eliminate 640 hours of

133
00:03:59,207 --> 00:04:01,132
maintenance and calibration costs on

134
00:04:01,167 --> 00:04:02,172
the tooling.

135
00:04:02,207 --> 00:04:03,636
One of the things we changed was to

136
00:04:03,671 --> 00:04:05,580
use an improved UT inspection technique.

137
00:04:05,615 --> 00:04:08,019
Using this technique it’s allowed us

138
00:04:08,054 --> 00:04:10,412

to cut our processing times in half

139
00:04:10,447 --> 00:04:12,115
for that same inspection.

140
00:04:12,150 --> 00:04:14,987
The changes that we are proposing do

141
00:04:15,022 --> 00:04:17,028
not increase our technical risk.

142
00:04:17,063 --> 00:04:19,404
If anything they decrease our technical

143
00:04:19,439 --> 00:04:22,459
risk and allow us to find the defects

144
00:04:22,494 --> 00:04:25,228
and remove them from the process and

145
00:04:25,263 --> 00:04:27,460
the design to give a better part and

146
00:04:27,495 --> 00:04:29,275
a more reliable part; something that

147
00:04:29,310 --> 00:04:30,852
we are proud to handoff.

148
00:04:30,887 --> 00:04:32,588
These are just a few of the

149
00:04:32,623 --> 00:04:33,812
improvements we are making as we

150
00:04:33,847 --> 00:04:35,188
transform our business and culture.

151
00:04:35,223 --> 00:04:36,828
We estimate that these improvements

152
00:04:36,863 --> 00:04:38,059
will reduce the total component

153
00:04:38,094 --> 00:04:41,172
processing time by 46% compared to

154
00:04:41,207 --> 00:04:42,444
the Ares and Shuttle program.

155
00:04:42,479 --> 00:04:43,996
I know we can be more affordable

156
00:04:44,031 --> 00:04:45,844
without jeopardizing safety or

157
00:04:45,879 --> 00:04:47,692
reliability. We are committed to

158
00:04:47,727 --> 00:04:49,252
supporting NASA’s vision of a Space