1
00:00:01,650 --> 00:00:07,680
Music

2
00:00:07,680 --> 00:00:12,260
President Barack Obama: We'll start by sending astronauts to an asteroid for the first time in history.

3
00:00:12,260 --> 00:00:20,670
Music

4
00:00:20,670 --> 00:00:26,200
NARRATOR: Capturing and repositioning an asteroid in space and then sending a crew of astronauts up to

5
00:00:26,200 --> 00:00:37,880
it to collect samples will test NASA on levels of innovation and ability unmatched since the 1960s.

6
00:00:37,880 --> 00:00:44,150
Back then, America's space agency invented launch vehicles, spacecraft and numerous technologies

7
00:00:44,150 --> 00:00:49,720
needed to make their cutting edge exploration missions possible.

8
00:00:49,720 --> 00:00:54,840
Today, engineers, designers and technicians are re-inventing what it takes to operate a

9
00:00:54,840 --> 00:01:02,440
space program with multiple goals and many new machines capable of carrying them out.

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00:01:02,440 --> 00:01:08,290
At Kennedy Space Center, an effort called the Ground Systems Development and Operations Program

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00:01:08,290 --> 00:01:16,560
focuses on updating the agency's infrastructure to host the future of rocketry and spaceflight.

12
00:01:16,560 --> 00:01:23,140
Every day, engineers and designers who specialize in aerospace are creating, testing and putting

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00:01:23,140 --> 00:01:26,070

into place the hardware necessary to assemble,

14
00:01:26,070 --> 00:01:32,670
transport and launch the next generation of rockets and spacecraft.

15
00:01:32,670 --> 00:01:36,060
TOM HOFFMANN, Vehicle Integration and Launch Team: This is a very busy time for NASA.

16
00:01:36,060 --> 00:01:39,290
I came from shuttle and most of the people in my group came from shuttle and

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00:01:39,290 --> 00:01:42,490
we're busier now than we were with shuttle.

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00:01:42,490 --> 00:01:47,920
NARRATOR: Based at Kennedy Space Center in Florida, GSDO is primarily focused on the ground support

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00:01:47,920 --> 00:01:55,270
structure that will be needed by rockets as large and powerful as the Space Launch System.

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00:01:55,270 --> 00:02:00,190
The structures, ranging from the iconic Vehicle Assembly Building, or VAB,

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00:02:00,190 --> 00:02:05,560
to the historic Launch Complex 39 could also be used by much smaller launchers,

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00:02:05,560 --> 00:02:10,280
including those under development by private space companies.

23
00:02:10,280 --> 00:02:14,970
Mobile launch platforms that will move between the VAB and launch pads are expected to

24
00:02:14,970 --> 00:02:20,310
get facelifts, too, to meet a variety of new demands. Even the crawler-transporters that

25
00:02:20,310 --> 00:02:27,570
rolled the Saturn V and space shuttle to the launchpads are getting additional changes for new roles.

26
00:02:27,570 --> 00:02:34,580
HOFFMAN: It's very difficult to design facilities for multi-users. This is new to NASA and

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00:02:34,580 --> 00:02:40,100
in fact new to the space business. Traditionally, all of these facilities are

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00:02:40,100 --> 00:02:45,760
built with one vehicle in mind and they interface to that vehicle very specifically.

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00:02:45,760 --> 00:02:51,200
NARRATOR: Launch Pad 39B, the starting point for many missions during Apollo and the shuttle era,

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00:02:51,200 --> 00:02:57,650
already proved its flexibility in launching the Ares I-X Flight Test in 2009.

31
00:02:57,650 --> 00:03:02,530
Since then, the dominant features of the pad were removed to make way for the centerpiece of the

32
00:03:02,530 --> 00:03:07,460
21st century launch concept: a clean pad.

33
00:03:07,460 --> 00:03:14,000
HOFFMAN: To get pad B ready for the multi-user, what we're doing is we're going with the clean pad concept.

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00:03:14,000 --> 00:03:19,890
The vehicle will come out with all of its support structure. It's not unique to one vehicle.

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00:03:19,890 --> 00:03:26,080
NARRATOR: In the VAB, work platforms several stories tall have been removed to make way for a new systen

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00:03:26,080 --> 00:03:32,810
platforms that adjust to different dimensions - again a new development modeled to

37
00:03:32,810 --> 00:03:35,820
accommodate different kinds of rockets. A full-size replica of the Orion spacecraft that is being

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00:03:35,820 --> 00:03:44,440

developed to take astronauts into deep space is already aiding designers in the VAB.

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00:03:44,440 --> 00:03:50,540
HOFFMAN: It helps us because we have to be able to figure out how to process these vehicles.

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00:03:50,540 --> 00:03:56,700
We have mockups like this vehicle here, this mockup here, that we can use to practice lifting,

41
00:03:56,700 --> 00:04:01,360
for sizing, put scaffolding up to them and all the processing that we need to do,

42
00:04:01,360 --> 00:04:04,100
all the handling and access.

43
00:04:04,100 --> 00:04:08,360
NARRATOR: Changes are taking place at Kennedy's runway, too, where facilities are being

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00:04:08,360 --> 00:04:14,010
established to host high-flying air and spaceships that can take off like an airplane and

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00:04:14,010 --> 00:04:18,890
soar to the edge of space before returning to a safe landing.

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00:04:18,890 --> 00:04:24,150
HOFFMAN: So out at the runway, what we're doing is we're changing the infrastructure there to support

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00:04:24,150 --> 00:04:30,240
a whole lot more customers. Right now, we have a lot of customers that are using the runway

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00:04:30,240 --> 00:04:35,260
for aircraft, for race cars, all kinds of things.

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00:04:35,260 --> 00:04:42,670
NARRATOR: While the task is new to the engineers, the solutions can often be found in NASA's heralded past

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00:04:42,670 --> 00:04:47,570
HOFFMAN: We have a lot of issues where we're trying to figure out a way of doing things

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00:04:47,570 --> 00:04:52,310
and we say, well how did the old guys do it in Apollo? And we'll look up how they did it

52
00:04:52,310 --> 00:04:58,710
and those guys were pretty smart. A lot of times we'll end up doing things similar to the

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00:04:58,710 --> 00:05:00,470
way they did them in the old days.

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00:05:00,470 --> 00:05:04,210
NARRATOR: With an eye toward using concepts that worked in the past,

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00:05:04,210 --> 00:05:09,640
the Vehicle Integration and Launch team is blending in new and unique elements of spaceflight

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00:05:09,640 --> 00:05:13,860
to bring to reality a future of success and innovation.

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00:05:13,860 --> 00:05:17,440
HOFFMAN: By this retooling effort, we're going to have the infrastructure we need to

58
00:05:17,440 --> 00:05:23,100
take us through many years into the future. We're going to be much more efficient,