



Presentation by
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LENGTH: 25 minutes
FILM: "Moon Mission"
SLIDES: 17
MODELS: Saturn I
(Blocks I & II)
Saturn IB
Saturn V

VII, 1

SATURN AND ITS MISSION

Thank you, Mr. _____

It is a pleasure for me to be here this evening to discuss the SATURN program. In the next few minutes, I hope to give you SATURN's background, SATURN's present status, and some of our future plans.

The roots of our present launch vehicle programs go back many hundreds of years. The SATURN program was preceded by generations of planning and experimentation by hundreds of investigators -- some known, the majority unknown. Their contributions are basic to development of space technology as we know it today.

Flight vehicles followed technological development. But not until the 1950's did we develop the capability to launch satellites and manned space capsules. Logically, the next step is to launch multi-manned spacecraft for explorations beyond the earth.

The vehicle being developed for these multi-manned explorations is Saturn. In March of this year, we had our fourth successful Saturn flight. Four successes out of four attempts. I know some of you have seen the flight on TV, but I daresay few, if any, have seen it in color. If we may have the lights off please, I would like to show you a short color film of the latest flight.

FILM -- SA-4 Flight

altitude of Igor - 40 mi.
altitude - 90 miles
range - 100 miles

DURING FILM TOWARD END.....

The vehicle at liftoff weighed about 1 million pounds.

It reached a maximum velocity of approximately 3500 miles per hour.

Toward the end of the flight we purposely cutoff one of the eight engines to check the vehicle's engine-out capability. The vehicle compensated for the loss, and the test continued without failure.

SLIDE -- SA-4 on Pad

This is the vehicle you just saw in the movie prior to launch. Only the first stage was live -- the upper stages -- painted all-white as your see on the slide -- were water filled to simulate full propellant weight. We had originally designed this three-stage Saturn to orbit heavy satellites. Then in May of 1961 President Kennedy proposed manned lunar landings within this decade.

SLIDE -- Apollo ?

A spacecraft to reach the lunar surface was needed immediately. The Manned Spacecraft Center, Houston, Texas, was assigned responsibility for spacecraft development. This is the lunar landing craft -- the only part of the Apollo spacecraft which will reach the Moon.

SLIDE -- Block II SATURN

We at Marshall began Saturn design modifications to accommodate the spacecraft. Eventually, the third stage of the Saturn was replaced with the Apollo spacecraft. The result is this two-stage Saturn.

SLIDE -- Block II Booster

Some vehicle changes were necessary. We lengthened the tanks to increase propellant

capacity. Fins were added to stabilize the vehicle during a manned flight.

The first stage, or booster, will be built in New Orleans by the Chrysler Corporation.

SLIDE --- Block II Second Stage

The two-stage SATURN has a dual objective. First, it will flight test a live second stage. This stage is being built by Douglas Aircraft Corporation at Santa Monica, California.

SLIDE -- Instrument Unit

Here is the instrument unit which houses all guidance equipment -- the mechanical brain of the vehicle.

SLIDE - APOLLO

Our second objective for this SATURN is to place early test models of the APOLLO spacecraft into low earth orbit. I will discuss

APOLLO in a minute

SLIDE -- Saturn IB

The two-stage SATURN is powerful enough to place portions of the spacecraft into low earth orbit -- it is not powerful enough to lift the complete lunar exploration spacecraft.

This gap was filled last summer, when NASA approved the SATURN IB. Actually the IB is not a new vehicle requiring a full research and development program.

SLIDE -- S-IB

But is a combination of the booster from the two-stage SATURN

.... And the third stage from the SATURN V.

SLIDE -- S-IVB

The IB will be able to place about 16 tons into earth orbit. This weight is, roughly, equal to about 11 Chevrolets.

SLIDE -- IB/APOLLO

The IB will test the complete APOLLO spacecraft which will eventually perform the lunar flight and landing. During early flight tests, we will concentrate on spacecraft qualification, crew training, and maneuvering in orbit. All in preparation for the actual lunar flight with the SATURN V.

SLIDE -- SATURN V

NASA approved development of the SATURN V in January of 1962. Its mission is to support circumlunar flight and manned lunar landings.

SLIDE -- V Booster

The first stage, which you see here, has five engines. Each of these engines produces thrust equal to our present SATURN booster. We are producing the first of these boosters at Marshall. Later, the Boeing Company will assume responsibility for production as it begins at New Orleans.

SLIDE -- Saturn V - SII

This is the second stage. Like the first,

it is 33 feet in diameter -- about the same diameter as this room at its widest point.[?] The stage has five engines which burn a high impulse fuel -- liquid hydrogen. I might add, all SATURN upper stages burn this propellant. Here is another example of where we have used technological developments from early programs in our advanced programs.

SLIDE -- SATURN V/S-IVB

This is the third stage of SATURN V.

It is propelled by a single engine. You will recall I referred to this stage a few minutes ago in connection with the Saturn IB.

SLIDE -- APOLLO Cutaway

Once the Saturn V has placed the spacecraft into flight toward the moon, its mission is complete. The lunar journey is completed by the APOLLO spacecraft.

The spacecraft is composed of three sections.

The first -- at the top -- is the 3-man crew compartment.

Next, is the propulsion and power unit.

The third is the landing module or "bug" for reaching the moon's surface.

Of all the vehicle and spacecraft segments, the Command Module - at the top - is the only portion to return to earth.

SLIDE -- Vehicle Comparisons

Here are the SATURNs in review. Quickly, the one on your right will proof-test the live second stage, then test model spacecraft in low earth orbit. The one in the middle will place complete manned lunar spacecraft into earth orbit for training purposes. The one to your left, the Saturn V, will drive the APOLLO on circumlunar flights and space exploration.

I should now like to show you one of the missions planned for the SATURN V. This is

a typical lunar exploration flight -- planned by scientist and engineers, and envisioned by artists.

FILM -- Moon Mission

May we have the lights off please, and the film.

LIGHTS OFF

LIGHTS UP

I hope you enjoyed the trip. Of course, some details may be changed later, as the lunar mission is still being planned out. There is still much concentrated and continuous effort to be expended. Stages must be perfected, mated, and flight tested. Compatibility of the vehicle and the spacecraft must be proven.

Crew capability must be perfected. Reliability of all systems must be proven beyond a doubt.

Meanwhile, other projects and applications for SATURN are under consideration. However, all other plans are of secondary importance until SATURN has fulfilled its role in the lunar program.