1
00:00:00,000 --> 00:00:05,000
(music)

2
00:00:05,000 --> 00:00:11,000
Deep Space Network is basically required to do the kind of things that we do in space.

3
00:00:11,000 --> 00:00:14,000
Clearly if you can't talk to your spacecraft and they can't talk to you

4
00:00:14,000 --> 00:00:17,000
then there's no point in even sending them out there

5
00:00:17,000 --> 00:00:22,000
DSN makes everything we do possible. Imagine landing night for example for Curiosity.

6
00:00:22,000 --> 00:00:25,000
Without the Deep Space Network, there would be no one in there because there would be nothing to see.

7
00:00:25,000 --> 00:00:29,000
We would hear nothing from the spacecraft. No touchdown confirmed, no cheering, no nothing.

8
00:00:29,000 --> 00:00:33,000
The Deep Space Network is what helps us figure out where the spacecraft is.

9
00:00:33,000 --> 00:00:36,000
We wouldn't even get close to Mars without it.

10
00:00:36,000 --> 00:00:39,000
The Deep Space Network comprises of three complexes

11
00:00:39,000 --> 00:00:40,000
around the world

12
00:00:40,000 --> 00:00:42,000
placed about 120 degrees apart.

13
00:00:42,000 --> 00:00:48,000

This insures that we are constantly in touch with the spacecraft as the Earth rotates.

14
00:00:48,000 --> 00:00:53,000
We're today tracking 33 spacecrafts not only the U.S. spacecrafts,

15
00:00:53,000 --> 00:00:55,000
also the spacecrafts from other countries.

16
00:00:55,000 --> 00:00:58,000
And remember, this is not only talking to the spacecraft.

17
00:00:58,000 --> 00:01:01,000
We have been able to do radar and radio astronomy.

18
00:01:01,000 --> 00:01:09,000
And it was the radar on this antenna that actually was used for even the men landing on the moon

19
00:01:09,000 --> 00:01:16,000
50 years ago, director of JPL, Dr. Pickering, and NASA,

20
00:01:16,000 --> 00:01:21,000
had established the Deep Space Network to provide communications for all the deep space missions.

21
00:01:21,000 --> 00:01:27,000
Rather than having each of the missions build their own ground network.

22
00:01:27,000 --> 00:01:33,000
We used to use big analog recorders for telemetry signals. We used a 2-inch wide tape.

23
00:01:33,000 --> 00:01:38,000
In the beginning the first computers we put in we had 64,000 words maximum

24
00:01:38,000 --> 00:01:44,000
and we had to be able to support every mission, NASA missions, other foreign missions,

25
00:01:44,000 --> 00:01:48,000
and digital technology and computers allowed that to happen.

26
00:01:48,000 --> 00:01:54,000
If you look at the Cassini mission, we've got a transmitter about an average of 800-900 million miles away.

27
00:01:54,000 --> 00:01:59,000
The transmitter is about the power of your refrigerator light bulb

28
00:01:59,000 --> 00:02:03,000
and that is what is bringing all these incredible images and data back.

29
00:02:03,000 --> 00:02:09,000
I think it's a resource to be treasured but it's a resource that also needs to be nourished.

30
00:02:09,000 --> 00:02:14,000
We're looking at missions with higher data rate, more complicated missions with more instruments

31
00:02:14,000 --> 00:02:17,000
on the missions. We are looking at optical comm, and with optical comm,

32
00:02:17,000 --> 00:02:23,000
one day we should have streaming videos. You can see real time rather than a simulation.

33
00:02:23,000 --> 00:02:28,000
We're seeing our success in almost real time and knowing right away,

34
00:02:28,000 --> 00:02:30,000
seeing those pictures, all possible because of the DSN.