1
00:00:15,410 --> 00:00:12,950
mars phoenix lander is headed for the

2
00:00:18,099 --> 00:00:15,420
north polar region of mars and its goal

3
00:00:20,870 --> 00:00:18,109
will be to search for habitable regions

4
00:00:23,630 --> 00:00:20,880
places where life may have existed in

5
00:00:26,330 --> 00:00:23,640
the past the phase that we're in now is

6
00:00:28,429 --> 00:00:26,340
called cruise which sounds really easy

7
00:00:30,830 --> 00:00:28,439
and laid-back although it's actually a

8
00:00:33,920 --> 00:00:30,840
very busy time for the spacecraft teams

9
00:00:36,110 --> 00:00:33,930
we're busy making sure the systems of

10
00:00:39,069 --> 00:00:36,120
the spacecraft are are working as they

11
00:00:42,590 --> 00:00:39,079
should the teams are busily preparing

12
00:00:45,110 --> 00:00:42,600
for the science is going to occur after

13
00:00:47,000 --> 00:00:45,120

landing the navigation team is getting

14
00:00:50,510 --> 00:00:47,010
ready to make sure that the spacecraft

15
00:00:53,840 --> 00:00:50,520
actually gets to its target on Mars it's

16
00:00:56,510 --> 00:00:53,850
very similar to the sport of archery in

17
00:00:58,189 --> 00:00:56,520
archery you have archer who's standing

18
00:01:00,250 --> 00:00:58,199
some distance away from the target and

19
00:01:04,399 --> 00:01:00,260
and that person's job is to make sure

20
00:01:07,490 --> 00:01:04,409
that the arrow hits the target an archer

21
00:01:10,190 --> 00:01:07,500
will have to draw back the bow with a

22
00:01:13,340 --> 00:01:10,200
certain amount of force secondly the

23
00:01:15,890 --> 00:01:13,350
Archer has to make sure that he aims the

24
00:01:18,620 --> 00:01:15,900
arrow at a certain angle and then that

25
00:01:20,390 --> 00:01:18,630
arrow actually has to to traverse the

26
00:01:23,090 --> 00:01:20,400
correct amount of distance so that it

27
00:01:26,120 --> 00:01:23,100
hits the target these three things have

28
00:01:29,300 --> 00:01:26,130
to come together just right we're

29
00:01:31,999 --> 00:01:29,310
watching a spacecraft to Mars it's a

30
00:01:36,649 --> 00:01:32,009
little different the bow in this case is

31
00:01:39,710 --> 00:01:36,659
a 250 ton rocket our arrow is the

32
00:01:43,310 --> 00:01:39,720
Phoenix spacecraft it has to travel over

33
00:01:46,910 --> 00:01:43,320
420 million miles to its target that's

34
00:01:50,810 --> 00:01:46,920
70 miles long by 15 miles wide this is

35
00:01:55,039 --> 00:01:50,820
like trying to shoot your arrow from

36
00:01:58,560 --> 00:01:55,049
Dodger Stadium and hitting home plate at

37
00:02:05,380 --> 00:02:01,029
this seems almost like an impossible

38
00:02:07,599 --> 00:02:05,390

shot to take just in one single shot so

39
00:02:11,020 --> 00:02:07,609
we actually make it a little more fair

40
00:02:18,910 --> 00:02:11,030
by having six opportunities to correct

41
00:02:26,080 --> 00:02:18,920
that trajectory along the way imagine if

42
00:02:34,339 --> 00:02:31,309
stop it in its path check to make sure

43
00:02:37,130 --> 00:02:34,349
it's on course for the target and if not

44
00:02:41,440 --> 00:02:37,140
be able to nudge it back to its target

45
00:02:45,140 --> 00:02:41,450
so that it's headed for the right place

46
00:02:48,290 --> 00:02:45,150
now of course our spacecraft is moving

47
00:02:52,130 --> 00:02:48,300
at about 60,000 miles per hour it never

48
00:02:54,020 --> 00:02:52,140
stops so the corrections have to be

49
00:02:57,080 --> 00:02:54,030
performed along the way while the

50
00:02:58,970 --> 00:02:57,090
spacecraft is still in motion we track

51
00:03:01,430 --> 00:02:58,980
the spacecraft using the deep space

52
00:03:04,520 --> 00:03:01,440
network of antennas and we figure out

53
00:03:07,460 --> 00:03:04,530
exactly where the spacecraft is where

54
00:03:10,309 --> 00:03:07,470
it's heading and then compute where it

55
00:03:13,729 --> 00:03:10,319
actually needs to be we develop commands

56
00:03:15,259 --> 00:03:13,739
to fire the thrusters on board the

57
00:03:18,650 --> 00:03:15,269
spacecraft to make any corrections that

58
00:03:21,140 --> 00:03:18,660
when you can make 22 hours prior to

59
00:03:23,860 --> 00:03:21,150
entry we have one last chance to make a

60
00:03:27,320 --> 00:03:23,870
fine tuning of where we're going to land

61
00:03:29,569 --> 00:03:27,330
the arrow hitting a target is a decent

62
00:03:33,229 --> 00:03:29,579
analogy for what the navigation team

63
00:03:35,569 --> 00:03:33,239

does but in reality it's a lot more

64
00:03:38,270 --> 00:03:35,579
complicated than that Earth and Mars are

65
00:03:41,539 --> 00:03:38,280
rotating around the Sun at at various

66
00:03:43,819 --> 00:03:41,549
speeds and constant motion the

67
00:03:46,099 --> 00:03:43,829
spacecraft itself is moving very fast

68
00:03:48,949 --> 00:03:46,109
across the solar system it's trying to

69
00:03:51,380 --> 00:03:48,959
hit a moving target and that target is

70
00:03:54,410 --> 00:03:51,390
also spinning on its axis and we have to

71
00:03:56,630 --> 00:03:54,420
keep all of these things in mind while

72
00:03:58,610 --> 00:03:56,640
we're attempting to hit this target it's

73
00:04:00,890 --> 00:03:58,620
pretty challenging all these things that

74
00:04:04,130 --> 00:04:00,900
you have to take into account and

75
00:04:07,009 --> 00:04:04,140
actually get get done during this