

## NASA Begins Building its Next Mars Rover Mission

03:13

### **Transcript:**

Narrator: NASA's next Mars rover is in development — and has an ambitious mission. Decades of Mars research from previous spacecraft have shown the planet not only had water in the ancient past, but had environments that could have supported life.

Thomas Zurbuchen: Mars is our neighboring planet and in many ways the most similar to us — and certainly in its history. And the question of whether ancient life was there is still the question that keeps us up at night.

Ken Farley: Mars 2020 has two new objectives: to specifically seek the signs of life, and then sample materials and prepare a cache that could be returned to Earth by a future mission.

Thomas Zurbuchen: Mars 2020 is really the essential first part of a sample return mission. So it actually looks at the environment of these samples and then collects them and stores them. Afterwards we will of course go and bring these samples back. So Mars 2020 is the first half of a return trip.

Farley: The Mars 2020 mission, to the maximum extent possible, follows the Mars Science Laboratory (Curiosity) Mission. We're gonna use a very similar rocket; a very similar cruise stage; a very similar Entry, Descent and Landing; and the rover — when you step back — will look almost identical.

Erika K Hines Stilley: Not only were a lot of designs already developed for the most part, but we're also using a lot of spare hardware that we had from MSL (or "Curiosity") for Mars 2020. If you know where to look on Lab, you can walk around and see a lot of the EDL hardware and the cruise stage hardware that's already been built.

Farley: And this is really important for understanding why this mission makes sense. We have to do relatively little in the way of new development. This saves money; it saves risk; it saves time — it's the right way to pursue this kind of mission.

Narrator: Mars 2020 also features new technologies for Entry, Descent and Landing — allowing it to target a smaller landing zone, and even divert from known risks in the area.

Hines Stilley: It means that we can both go to places that are maybe more interesting to the scientists because we're able to handle places with more hazards;

as well as land closer to the things they're interested in off the bat — so we get to the science they care about, and more quickly.

Farley: The three key sites that we are considering right now share one thing in common: they are all environments that might have been habitable in the very distant past. One of them is the floor of an ancient lake; another is a hot spring; and the third one is a site where hot water interacted with rocks in the shallow subsurface. We have instruments on board which are expressly designed to seek evidence of ancient life — what we call “biosignatures” — and we have the capability to prepare samples, drill them out of a rock, seal them in a tube, so that a future mission could go and bring them up — we call that “caching.”

Zurbuchen: So it is a first of a new type of mission, which is to bring samples back to the best labs we have, which are here on Earth. Mars 2020 is a pivotal mission in our search for life that could finally answer the age-old question: “Are we alone?”