

Mars Rover Update Preparing For Another Winter

March 2 2006

In a race to collect as much scientific data as possible before the onset of the Martian winter, Spirit climbed to the top of the formation in Gusev Crater called Home Plate and acquired images of the surrounding terrain. Each day, Spirit's instruments log a reduction in solar energy collected as the Sun sinks lower on the planet's northern horizon.

The rover science team's objective is to complete as much science as possible while concentrating on a drive campaign that will move the rover to the north-facing slopes of McCool Hill. The team already has begun mapping routes to McCool, where Spirit will attempt to survive its second Martian winter with its solar panels tilted toward the Sun.

Meanwhile, after completing work at the outcrop called Olympia, Opportunity proceeded around the western edge of Erebus Crater at Meridiani Planum toward a formation dubbed Payson. After performing diagnostic tests on its Martian sol 735 (Feb. 17), the rover team decided to increase rotor resistance from 65 ohms to 80 ohms for stowing and unstowing the robotic arm.

Opportunity successfully stowed and unstowed the arm on sols 740 and 741. As long as the robotic arm remains in calibration, the team said, the higher resistance value provides no additional risk.

Spirit sol-by-sol summaries:

Sol 758 (Feb. 19): Spirit conducted targeted remote sensing and acquired

13-filter images of a target dubbed Wilmington, as well as mosaics of the surrounding terrain, with the panoramic camera.

Sol 759: It edged closer to a rock nicknamed James 'Cool Papa" Bell.

Sol 760: It acquired images of its work area with the navigation and panoramic cameras. The rover also conducted atmospheric observations.

Sol 761: It used the microscopic imager to acquire images of a rock target called Stars, then brushed the target with the rock abrasion tool and examined it again with the microscopic imager. Spirit then began checking the mineral composition of the Stars target with the Mössbauer spectrometer.

Sol 762: The rover continued the Mössbauer study of Stars. Following an overhead pass of the Odyssey orbiter, Spirit began an analysis of Stars with the alpha particle X-ray spectrometer. Scientists planned to have the rover continue collecting scientific data over the weekend from another target, nicknamed Crawfords.

Also, as of sol 762 (Feb. 23), Spirit's total odometer reading was 6,589.83 meters, or 4.09 miles.

Opportunity sol-by-sol summaries:

Sol 735 (Feb. 17): Opportunity conducted diagnostic activities on its robotic arm, making small movements of the shoulder joint with rotor resistance set at 75 ohms. If the arm were to fault out during any of the motions, the rover would clear the fault and re-set the resistance, first to 80 ohms, and then to 85 ohms. However, the arm completed all motions successfully with rotor resistance set at 75 ohms.

Sol 736: The rover team attempted for a second time to send instructions

via X-band frequencies for a drive to a target called Zane Grey, but a Deep Space Network transmitter was down. The team did receive data from Opportunity over the same communications link.

Sol 737: Rover planners sent instructions to Opportunity for the second two days of the original three-day plan. Opportunity made atmospheric observations and measurements of the intensity of astronomical objects.

Sol 738: The rover continued to make remote atmospheric observations and photometric measurements.

Sol 739: It completed planned photometric measurements.

Sol 740: It began the planned drive to Zane Grey, stowing and unstowing its robotic arm with rotor resistance set at 80 ohms on the shoulder joint that controls compass direction. The rover halted after moving 21 centimeters (8 inches), when the right middle wheel reached the maximum current allowed. Motor currents on the other wheels remained nominal. Rover planners reduced the current limits after leaving Purgatory Dune to help prevent another imbedding event.

Sol 741: It drove 34.5 meters (113 feet) closer to the Payson outcrop after rover drivers set the current limits back to nominal values. Motor currents at the start of the drive were a bit higher than normal but dropped closer to normal values as the drive progressed.

Sol 742: Science team members planned to have Opportunity drive about 40 meters (130 feet) closer to Payson and acquire images from a distance of 20 meters (65 feet) over the weekend.

As of sol 742 (Feb. 24), Opportunity's total odometer reading was 6553.93 meters, or 4.07 miles.

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