

2002 Genesis Mission Status Updates: April, May, June

June 27, 2002

We continue to remain in low-speed solar wind. The concentrator rejection grid autorecovery patch was uploaded on Monday, which was over a week earlier than planned. At the same time, the rejection grid's maximum voltage was raised to 2060 V. The team estimates that approximately 1350 commands have been radiated to the spacecraft since launch. Genesis has been collecting solar wind particles for almost 7 months now.

June 20, 2002

We've had a lot of low speed solar wind over the last week; everything's normal.

A regularly scheduled test of the solar wind concentrator rejection grid was conducted on 6/17, and set a record high of 2100 Volts (up from 2080 Volts). The concentrator was returned to autonomous mode at the end of the test. While the results were encouraging, the science team did not deem the improvement large enough to alter the autonomous mode's operating configuration.

June 14, 2002

It's been a quiet week in space. The spacecraft continues to collect solar wind samples. Genesis has been collecting solar wind samples for 179 days and is scheduled to continue. The solar wind Genesis has observed has been in the low-speed regime. In two weeks, the Genesis spacecraft will be its farthest distance from the Sun this year.

June 6, 2002

The spacecraft continues to collect solar wind samples. Coronal mass ejections, fast solar wind/coronal holes, and slow solar wind regimes were all observed and the appropriate arrays were deployed to collect samples from each type of solar wind.

The navigation team issued the final reconstruction report on station keeping maneuver 2A, which was done on May 22. The total change achieved (0.7926 meters per second) was just 0.09 percent less than the change planned.

A 1-hour diagnostic test was performed this week on the Genesis ion monitor. Los Alamos National Laboratory, which supplied the monitor, will analyze the data.

May 30, 2002

The Day the Solar Wind Disappeared:

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Genesis continues to collect solar wind samples. The solar wind exhibited some unique behavior over the last week, including a "day when the solar wind disappeared."

The spacecraft detected extremely low densities (one particle in ten cubic centimeters or less than one particle in a cubic inch), extremely high wind speeds (approaching 1000 kilometers per second, or over 2,000,000 miles per hour), and multiple coronal mass ejections.

The onboard WIND algorithm was stumped by this rare behavior, so it positioned the collector arrays to a conservative configuration and set the concentrator high voltages to zero until conditions became more normal. More recently, WIND has detected a more normal coronal mass ejection regime and the arrays and concentrator have responded as intended.

We continue to have indications that last week's station-keeping maneuver was very accurate and maybe the best yet.

May 16, 2002

Genesis has now successfully completed the first of its five planned loops. Preparations are well underway for the next station-keeping maneuver (SKM), scheduled for May 22nd. The solar wind has been mostly low speed over the last week.

The flight software team has begun to work on a patch that will automatically reset the concentrator rejection grid voltage, rather than turn the concentrator off, if a latch-up occurs.

Telecom is nominal. We are currently downlinking data from the spacecraft at a rate of 47,400 bits per second and uplinking commands to the spacecraft at 2000 bits per second. Although there may be some variation in the signal, there will be no telecom configuration changes for the upcoming station-keeping maneuver.

May 9, 2002

It's been a quiet week; science collection continues as planned and all systems are operating well. The seventeenth background sequence went active on May 7th. The next stationkeeping maneuver (SKM-2A) should take place May 22nd and will be about 0.8 meters per second change, about 21 degrees off-sun.

It takes about 11 seconds for a signal to leave Earth, go to the spacecraft and come back.

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April 25, 2002

On Sunday, the second strongest solar storm since launch passed over the spacecraft: high-energy protons at a level several orders of magnitude higher than normal bombarded the spacecraft. Due to previous improvements in the onboard software, the spacecraft weathered this well.

During the solar storm, the star tracker lost track four times. The Attitude Control software handled the situation as intended so that overall spacecraft performance was unaffected and all daily maneuvers were completed as scheduled.

A Deep Space Network pass on Friday, April 19, revealed that a minor lapse in the solar wind concentrator occurred at 19:36 UTC on Wednesday, April 17, when the actual rejection grid voltage did not match the requested voltage. Either the solar environment or a random high-voltage arc in the rejection grid could have caused the fault.

After the science team analyzed it, the concentrator was turned back on and the rejection grid was tested. The concentrator performed exactly as it had earlier this month before the solar storm. Following the test, the concentrator was configured for a slightly lower rejection grid limit voltage and put back in autonomous mode.

April 18, 2002

For the Genesis spacecraft, solar particle collection continues as planned. The propulsion system is normal; a total of 13.14 kg of fuel has been used since the start of the mission.

The team has begun work on the next spacecraft background sequences containing flight software diagnostics, data management, clock correlation commands, daily precessions, ion and electron monitor calibrations, and collector array management surrounding the daily precessions. The sequence will cover 28 days and will be sent to the spacecraft on May 3.

On May 22, Genesis will conduct its fourth station-keeping maneuver, which ensures that the spacecraft maintains its orbit around the Lagrange point.

April 11, 2002

This past week, Genesis detected and low speed solar wind, high-speed solar wind/coronal hole, and a borderline coronal mass ejection.

A total of 13.13 kg of fuel has been used since the start of the mission, and 1.84 kg since the start of science.

Telecom continues to report good performance. The spacecraft, using the 26-meter Deep

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Space Network dish in Canberra, Australia, identified a ground station setting change that boosted performance.

April 4, 2002

The concentrator rejection grid patch was uploaded last Friday and is working normally. Just hours after the upload, the rejection grid properly went to 1880 volts when it detected some very high-speed solar wind, with speeds up to ~800 kilometers per second (2 million miles per hour.) On April 3, we performed another concentrator rejection grid test. Repeatable performance of the rejection grid was achieved up to 2080 volts, showing that the grid has "healed" by ~200 volts since January.

The navigation team completed its reconstruction of station keeping maneuver 1C and reports excellent performance.