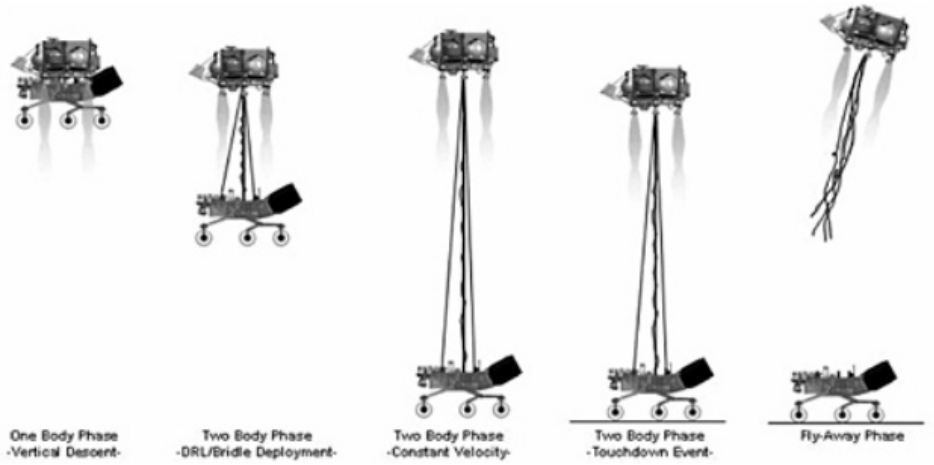
MSC Software's Adams plays Key Role in Curiosity's Descent & Landing on Mars

SANTA ANA, CA--(Business Wire – August 17th, 2012) – MSC Software Corporation today announced that its Adams multibody dynamics software played a crucial role in enabling the extraordinary descent and landing of the Curiosity Rover onto Mars on Sunday evening (August 5th). A team of engineers at the NASA Jet Propulsion Laboratory (JPL) performed a series of critical computer simulations of the sky crane maneuver sequences. In graceful fashion, the JPL team successfully and precisely placed the rover onto the Red Planet, in what many are calling an "immense technical achievement."

The computer simulations that JPL performed in Adams were essential to the mission. For instance, during the rover separation, they had to prevent the flight hardware from clashing or coming into contact with each other during the "two body phase" of the Descent Rate Limiter (DLR)/bridle deployment. Using Adams, the engineers were able to model and simulate this event, which was critical for them.



The dynamic event studies performed by the JPL team were unlike most performed for products functioning here on Earth. The team knew they needed to rely on computer simulations to study the extreme loading conditions that Curiosity potentially would face during the final descent, separation, and landing stages. Many conditions could not physically be tested anywhere on our own planet. The engineers dealt with complexities involving Martian gravity, atmosphere, surface slope, and landing velocities that could not be duplicated exactly here on Earth, and relied on the simulations to gain the insight they needed to feel confident in the execution of the mission. The series of Adams simulations took place in parallel with design – but it was insight from the simulations that helped guide the design to maturity, and to prevent any failures resulting from potentially harsh loading conditions during the mission.

MSC Software

In addition to the separation event, Adams simulations were used to study a complete series of events beginning with power descent to touchdown. The craft carrying the rover was traveling at a speed of 13,000 mph and had to decelerate to a speed at which the sky crane maneuver could lower the rover safely down onto the Mars surface. The team of engineers at JPL created several Adams sub-models including a high-fidelity detailed model of the rover itself. This effort was many times more difficult than that for previous rovers, and included development of a mobility deployment model, a model for the rover separation, and a model for touchdown.

“The employees at MSC are extremely proud of what the JPL team has accomplished,” said Dominic Gallello, CEO & President at MSC Software. “We congratulate the NASA team, and are delighted that our software supported such an extraordinary feat. It is always inspiring to acknowledge the ways in which our customers gain value from simulations, and at times even rely exclusively on the technology to execute sophisticated missions like Curiosity. It is an event we will always remember.”

About MSC Software

MSC Software is one of the ten original software companies and the worldwide leader in multidiscipline simulation. As a trusted partner, MSC Software helps companies improve quality, save time, and reduce costs associated with design and test of manufactured products. Academic institutions, researchers, and students employ MSC’s technology to expand individual knowledge as well as expand the horizon of simulation. MSC Software employs 1,100 professionals in 20 countries. For additional information about MSC Software’s products and services, please visit: www.mscsoftware.com

Press Contact:

Leslie Bodnar
leslie.bodnar@mscsoftware.com

MSC Software