NASAfacts

Lightning Protection for NASA's Next-Generation Spacecraft

LIGHTNING is a well-known danger, and a team of NASA and contractor personnel already is working to design and build a new lightning protection system that's larger than any the Kennedy Space Center has ever seen. The system's construction is expected to be completed in 2010 in time for NASA pioneers to begin exploring the moon, Mars and other destinations.

- NASA is beginning to transition Launch Pad 39B from a space shuttle facility into the launch site for the Constellation Program's Ares I crew launcher.
- The new system features large cables strung between three 594-foot-tall steel and fiberglass towers. Called a catenary wire system, it will dominate the launch area's skyline.
- The new system will provide better protection from lightning strikes and help avoid delays to the launch schedule by collecting more information on the strike for analysis by launch managers.
- Launch Pads 40 and 41, located south of Launch Complex 39, each have lightning protection systems similar to the new version. Each tower is topped with a fiberglass mast and a series of catenary wires and down conductors designed to divert lightning away from the rocket and service structure. This configuration helps keep the spacecraft hardware isolated from dangerous currents.
- While the space shuttle lightning protection system consists of a lightning mast on the top of each pad's service structure and two

An artist's rendition of a new lightning protection system that will be built at NASA's Kennedy Space Center Launch Pad 39B. The launch pad will be modified to support future launches of Ares and Orion spacecraft.

catenary wires, which shields the space shuttle and diverts strike currents down to the ground, the new system would significantly increase the shielding level and further separate the electrical current from vital launch hardware.

- An array of sensors, both on the ground and the mobile launcher, will help determine the vehicle's condition after a nearby lightning strike. This can prevent days of delays.
- Lightning detection has become simpler and faster as computer modeling has become more sophisticated.
- Decades' worth of local lightning data allow computer models to work faster and be more accurate than ever.
- Ivey's Construction Inc. is the contractor in charge of building the lightning protection system.

A heavy bank of storm clouds gather behind Space Shuttle Atlantis on Launch Pad 39B.

Construction began in November 2007 with the arrival of large cranes and concrete pilings.

- The system's foundation will include 216 concrete pilings extending up to 55 feet below ground. The massive steel towers will be partially assembled horizontally on the ground, then lifted into the vertical position by a 60-story-tall crane.

On Launch Pad 39B at NASA's Kennedy Space Center, the crane crawler lifts a piling off a truck. The piling will be pounded into the ground to help construct lightning towers for the Constellation Program and Ares/Orion launches. Pad B will be the site of the first Ares vehicle launch, including Ares I-X which is scheduled for April 2009.

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