



# Space-Age Coating Protects Structural Concrete

*A NASA Technology to Protect your Investment and your Bottom Line*

by Kara L. Gray, Robert C. Byrd National Technology Transfer Center

London Bridge may be falling down, but a new NASA technology may prevent similar deterioration in a variety of reinforced concrete applications. Engineers, Louis MacDowell and Joseph Curran at NASA's Kennedy Space Center (KSC) have developed a space-age coating that protects the reinforcing steel (rebar) used in concrete.

This technology, called the galvanic liquid applied coating system (GLACS), shows tremendous potential for commercial application, and is available for licensing or partnership through NASA's Commercial Technology Program. A number of potential applications have already been identified including highways, bridges, piers and docks, cooling towers, parking garages and concrete roofs.

According to Orlando Melendez, technology commercialization manager at KSC, GLACS was originally developed to inhibit the deterioration of structures such as KSC's Vehicle Assembly Building (VAB).

"The Vehicle Assembly Building, where the orbiter and solid rocket boosters are put together, is one of the largest buildings in the world - and its roof is made of reinforced concrete," Melendez said. "The environment here at Kennedy is very corrosive with the saltwater spray from the ocean and the exhaust from the rockets and Space Shuttle. This corrosion was taking its toll on the Vehicle Assembly Building and similar structures at Kennedy Space Center."

Similar in concept to the treatments used to protect wooden structures, GLACS is a liquid coating applied to the outer surface of reinforced concrete



*Some of these elevated concrete slabs at KSC's Materials Science Beach Corrosion Test Site have been coated with GLACS to measure the coating's effectiveness in harsh environments.*

to protect the imbedded rebar. Over time and without protection, the rebar that is used to reinforce structural concrete will corrode, causing the concrete structure to fail. GLACS prevents this deterioration through the sacrificial cathodic protection action of the coating.

GLACS is both inexpensive and effective with the normal routine maintenance expected in these structures. The coating is applied to concrete after it has set, and could even be applied to existing structures to inhibit further erosion of the structural rebar.

"The advantage of this technology is that many standard methods can be used in the application," said Joe Robles, Dynacs technology marketing specialist at KSC. "It (GLACS) can be sprayed on, rolled on or painted on with a brush. Not much time or highly skilled labor is required to apply or maintain the coating."

MacDowell and Curran have conducted extensive testing at KSC's Materials Science Beach Corrosion Test Site. GLACS has proven very successful in these small-scale tests.

"Some final testing on very large commercial and industrial structures is still ongoing, and we're pursuing verification studies with a third-party research institute," Robles said.

While KSC pursues the final testing phases of this technology, Robles and Melendez say they are actively searching for partners to license this technology for commercial application.

"We don't know of any other technology like this,"

Melendez says. "The commercial potential for something that might preserve facilities and structures holds incredible value."

NASA has partnered with all types and sizes of businesses, leveraging the combined resources of both to produce win-win results. These partnerships can take on a variety of forms with varying levels of formality, from licensing to collaborative research projects.

If you are interested in obtaining more information about this technology, or some of the other areas in which NASA is looking to develop partnerships, please call the Robert C. Byrd National Technology Transfer Center (NTTC) at **1-800-678-NTTC (6882)** or visit [www.nasatechnology.com](http://www.nasatechnology.com). NTTC, located on the campus of Wheeling Jesuit University, is working closely with NASA to facilitate strategic partnering opportunities between NASA and U.S. industry.



*This is the fifth in a series of articles highlighting advanced materials technology partnering opportunities with NASA. Watch for follow-up articles in future issues of SAMPE Journal.*