



# News Release



Naval Air Systems Command  
Program Executive Office  
Air ASW, Assault and  
Special Mission Programs

Contact: John Milliman  
Phone: (301) 995-7410  
e-mail: john.milliman@navy.mil

## Marines Echo Praise for TiN

By Stephanie Vendrasco  
PEO (A) Public Affairs Support

On Canada's Prince Edward Island, employees of MDS-PRAD Technologies Corporation continue to make monumental differences for CH-53E and CH-46E operators around the world, one blade at a time.

At this very moment somewhere in the harsh and unforgiving desert of Iraq or the Horn of Africa a CH-53E helicopter with a General Electric T64 Turbine Engine or a CH-46E with a General Electric T58 Turbine Engine, coated with "TiN," is delivering a heavy but critical load of supplies, taking troops from one hot spot to another, or maybe, as unfortunate as it is, performing a casualty evacuation.

TiN, an erosion resistant multi-layer coating comprised of Titanium Nitride and other elements is applied to compressor blades within gas turbine engines.

"This technology more than doubled the reliability of the T64 engines operating in our deployed CH-53E helicopters," said Stoney MacAdams Assistant Program Manager for the Heavy Lift Helicopter Program Office. "This has become the standard for measuring the success of technology transition in terms of relevancy, coordination and timing. The tremendous effort of the Government-Industry team made this happen when the warfighter needed it the most."

Originally developed by Russians to prevent turbine blade erosion on their Mi-24 and Mi-28 Hind attack helicopters, this erosion coating is comprised of layers with both hard and elastic properties.

With coated turbine engine blades, sand and dust particles that are ingested bounce off the blades without penetrating the surface. The blades do not erode and engine performance and reliability remains intact.

"GE's T58 and T64 engines with TiN coating have 2-3 times the mission rates in the harshest environments around the globe," said

Marc Joslow, Director of T58 and T64 Programs for General Electric Aviation.

Helicopters with gas turbine engines that operate in harsh environments are at risk for extreme blade erosion. Desert operations expose engines to erosive material such as sand and dust, especially during take off and landing, leading to reduced engine performance and timely and expensive repairs.

During Operation Desert Storm, the Navy and Marine Corps recognized blade erosion as a major problem, especially on the CH-53E fleet which was adversely affected by lower engine performance.

"The reliability of General Electric's T64 engine in the CH-53E was significantly degraded because ingested sand had eroded compressor airfoils," said MacAdams. "The excessive erosion had reduced the time on wing of the T64 from roughly 450 hours to 100 hours."

Needing a solution following Desert Storm, the Department of the Navy evaluated several erosion-resistant engine airfoil coatings. In 1997 the Foreign Comparative Test Program successfully evaluated the Titanium Nitride Erosion Resistant Coating Process.

After completion of the development process under the T64 Component Improvement Program, the first T64 TiN configuration change was approved in June 2003 and the first T64 TiN engine was installed in a CH-53E in April 2004.

"This is the greatest thing that is happening in our program – this is huge for us," said Col. Paul Croisetiére, Program Manager Heavy Lift Helicopters. "We are much safer while operating with this technology and we need this technology on the rest of our fleet aircraft."

Facing similar circumstances, the CH-46E community also recently embraced TiN technology and is already seeing the return on their investment as well.

"In the field they are counting on us to get Marines into and out of tough places," said Lt. Colonel Harry Hewson, Program Manager for the H-46 Helicopter and T58 Engine. "For a CH-46E on a casualty evacuation mission, there are two numbers that really matter – 60 and 1. The first '60' minutes after someone has received a traumatic injury is called the golden hour where the probability of survival increases dramatically if given proper medical attention. And '1' refers to the one wounded Marine who will not be left behind by CH-46E crews in high risk situations. TiN provides the engine reliability to make that happen."

As of May 2006, GE Aviation and MDS-PRAD have delivered 366 engine sets for installation at Naval Aviation Depot Cherry Point and the H-53 Marine Aviation Logistics Squadrons.

More than 250 T64 engines have been assembled with TiN compressor airfoils with a total accumulation of over 48,000 engine flight hours of which approximately 180 TiN-coated T64-416/416A engines being used in Marine Corps CH-53E heavy lift helicopters.

Currently, 35 TiN coated T64 engines are operating in support of OIF, including the highest time TiN engines which are exceeding 1100 engine flight hours time on wing.

To date, 52 TiN coated T58 engines are in service with the CH-46E fleet as part of the T58 Engine Reliability Improvement Program. 8 are installed in aircraft deployed to Iraq in support of OIF, and every forward-deployed spare T58 engine features TiN coating.

The CH-53E will be replaced by the CH-53K providing the Marine Corps with a fully shipboard-compatible, that will provide capabilities for Ship-To-Objective Maneuver of 13.5 tons, two up-armored HMMWVs, at to a range of 110 nautical miles.

While the CH-46E is being replaced by the MV-22 as the Marine Corps' Medium Lift aircraft, they will continue to be deployed in support of the Global War on Terrorism with Marine Expeditionary Units and as stand-alone squadrons until approximately 2015.

-end-

Photo: Special guests of MDS-PRAD receive a TiN coated blade replica.

Left to Right are: Michael Dougherty, NAVAIR International Programs Director, The Honourable Pat Binns, Premier, Province of Prince Edward Island, Col. Paul Croisetiere, Program Manager, Heavy Lift Helicopters, Hans Odoerfer, CEO, MDS-PRAD Technologies Corporation, Lt. General Michael A. Hough (Ret.) Lt. Col. Harry J. Hewson, Program Manager, H-46 Helicopter and T58 Engine, John Sandford, Chairman, MDS-PRAD Technologies Corporation, Marc Joslow, Director, T58 and T64 Programs, GE Aviation



[Click here for High Resolution Photo](#)