



iMAST

Institute for Manufacturing and Sustainment Technologies

2013 Defense Manufacturing Achievement Award

Since 1995, the National Center for Advanced Technologies (NCAT), acting as the agent for the associations and societies involved in the Multi-Association Industry Affordability Task Force, has sought to recognize individuals, as well as small working groups/teams in the defense manufacturing community who make outstanding contributions which further the manufacturing science and technology effort within the United States. Through the industry's Defense Manufacturing Excellence Award, these associations and professional societies acknowledge and recognize the contributions of those scientists, designers, engineers, and managers involved in defense-related manufacturing who have sought to conduct research into ways and means to increase the production, affordability, and/or technical superiority of the nation's defense industrial base effort. During December 2013, at the annual Defense Manufacturing Conference, iMAST was honored as part of a team recognized for the project: *Restoration of Aerospace Parts by Cold Spray*.

Within the Army and Navy aerospace world, conventional repair processes for flight-critical components made from aluminum, titanium or magnesium alloys has always been a challenge. This project addressed several flight-critical aerospace components made



iMAST project leader, Dr. Timothy Eden (center) briefs Rear Admiral Matthew Klunder USN, Chief of Naval Research, on the Cold Spray project award, as it specifically applies to F/A-18 AMAD effort as iMAST Director, Tim Bair (left), looks on.

from of aluminum, titanium or magnesium alloys. Previous efforts to effect repairs using conventional repair processes have been unsuccessful. As a result, costly components are often removed from service and scrapped. This is a very expensive reality that costs the

Department of Defense (and ultimately the U.S. taxpayer) millions of dollars replacing those parts. Many of these parts have long lead times. In some cases, there are no replacement parts in inventory. Working in concert, the Navy (Office of Navy Research, NAVAIR, FRC East and FRC Southwest) and the Army (Army Research Laboratory, AMRDEC) along with OEMs (Sikorsky and Moog) developed processes for aerospace application that included: test protocols, validation and acceptance requirements, process procedures, and inspection requirements. As a result of these efforts the Cold Spray process has been implemented within Army, Navy and commercial aerospace facilities. Specific aerospace components being repair with the process include F/A-18 airframe mounted accessory drive (AMAD) gearbox, as well as the UH-60 magnesium gear box sump. Additional candidate components are currently being evaluated. Team members include: Navy—**Timothy Eden**, iMAST ARL, Penn State*; **Greg Woods**, ONR; **Frederick Lancaster**, NAVAIR; **Luc Doan** and **Conrad Macy**, FRC-SW; **Robert Kestler**, FRC-East; Army—**Victor Champagne***, Army Research Laboratory; **Michael Kane** and **Fernando Merritt**, AMRDEC; OEMs: **William Harris**, Sikorsky and **Bob Bierk**, Moog Inc.]

* Co-project leader