Field Evaluation Report III

16 January 2003

Date of Trip: 2-6 December 02

Location: Brunswick NAS, ME
Cape Canaveral AFS, FL
Patrick AFB, FL

Key Personnel Contacted:

Location	Name/Organization	Commercial Phone No.
Cape Canaveral AFS	Kurt Kessel NASA AP2 (ITB, Inc)	(321) 867-8480
Patrick AFB	Frank Falcone, CMSgt 920 MXS/LGMG	(321) 494-4705
Brunswick NAS	Kent Klein, CW04 AIMD/SE	(207) 921-2138
	Russell Jobe, ASC AIMD/SE	(207) 921-2138

Team Members:

HQ AFMC/LGMP-EV, Wright-Patterson AFB, OH
Susan Misra, Program Manager, (937) 257-3498

SAIC, Shalimar, FL
James Dean, (850) 609-3457

Purpose of Trip:

Visit all test locations and document gloss and color measurement readings and inspect test articles for coating failure and corrosion.

Findings:

Note: Pre-existing corrosion will not be considered in this evaluation. Rust formed in the hinge and/or seam areas (e.g. missed in hidden areas; opened piano hinge and faraday effect of the powder coating) during the initial coating application. Corroded areas will be monitored for the duration of this project. All pre-existing corroded areas (surface rust) appear to be the same as reported during our previous visit in June 02.

The USS Abraham Lincoln is deployed and not available, ASC Jeffrey Hageman, jhagem@lincoln.navy.mil, photographed the test panel assigned to their ship and forwarded them to SAIC for inclusion in the report.

Most gloss measurements were lower than what was reported in the first initial visit. Some measurements were above initial readings on the green-coated panels. Almost all of the readings on the white-coated panel at Brunswick NAS were lower than the readings from six months ago. (Attached are the color measurements for the test panels at NAS Brunswick and the USS Abraham Lincoln)

Cape Canaveral AFS, FL

Aircraft Generator, Registration # 80X1005, #140

The overall appearance of the coatings on the fender well looks sound except as noted below. The finder was cleaned with a wet rag and wiped dry to remove any dust and dirt. Coatings 3, (Deft three part coating), 4, (Aqua Poxy 912 with Deft Zero VOC topcoat), and 5, (baseline coating), all had spots of corrosion. First indications were a tool may have been dropped onto the fender, but could not confirm. The spot in coating 3, (Deft three part coating), had some minor undercutting taking place, but was not severe. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show significant fading. The upper edge of coating 5 has begun to rust the entire length of the panel. Additionally, the right hand top corner is blistering with visible rust approx 3"x ¼" in length. Coating 2 aft edge has been damaged and has begun to rust; probable cause of the coating damage may have been from hit another object. Pre-existing corrosion located in a seam weld area has not progressed beyond the surface rust previously reported. Wash schedules and materials are the same as reported on our initial visit.

Aircraft Generator, Registration # 87X1372, #150

The overall appearance of the coatings on the fender well looks sound except as noted below. The finder was cleaned with a wet rag and wiped dry to remove any dust and dirt. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show significant fading. The upper edge of coating 5 has begun to rust the entire length of the panel. Pre-existing corrosion located in a seam weld area has not progressed beyond the surface rust previously reported. Wash schedules and materials are the same as reported on our initial visit. No major corrosion founded during this visit.

Aircraft Generator, Registration # 83X1003, #137

The overall appearance of the coatings on the fender well looks sound except as noted below. The finder was cleaned with a wet rag and wiped dry to remove any dust and dirt. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show

significant fading. The upper edge of coating 5 has begun to rust the entire length of the panel. Pre-existing corrosion located in a seam weld area has not progressed beyond the surface rust previously reported. Wash schedules and materials are the same as reported on our initial visit. Minor corrosion reported on the edge of the wheel well opening, coating 3 (Deft three part coating) reported in our last visit has not progressed beyond surface rust.

Patrick AFB, FL

NF-2 Light Cart, Registration # R-96

The overall coating is sound and the appearance of the door panel looks good with some minor corrosion in coating # 3, (Deft three part coating). The door being opened and not being properly latched caused the corrosion and chipped paint occurred when the door hit the gas cap. The minor corrosion has not progressed beyond what was reported in our June 02 FER. Pre-existing corrosion located in the hinge and latch area has not progressed beyond the surface rust previously reported. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show significant fading. This unit was coated with "Corrosion X" Corrosion Preventative Compound corrosion preventive compound (CPC), which is used by maintenance personnel to help reduce corrosion on assigned equipment. The "Corrosion X" CPC was removed using a General Purpose Detergent, 7930-00-926-5280, Fed Spec P-D-1747C, Class 1. The 920 MXS maintenance personnel provided this product.

NF-2 Light Cart, Registration # R-97

The overall appearance of the door panel looks good with no major corrosion and some minor coating damage in coating #3, (Deft three part coating). The door being opened and not being properly latched caused the corrosion and chipped paint occurred when the door hit the gas cap. Pre-existing corrosion located in the hinge and latch area has not progressed beyond the surface rust previously reported. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show significant fading. This unit was coated with "Corrosion X" CPC, which is used by maintenance personnel to help reduce corrosion on assigned equipment. The corrosion "X" was removed using a General Purpose Detergent, 7930-00-926-5280, Fed Spec P-D-1747C, Class 1. The 920 MXS maintenance personnel provided this product.

NF-2 Light Cart, Registration # R-98

The overall appearance of the door panel looks good with minor rust found inside the door bottom lip caused by a piece of tape which was not removed when the initial coating application took place. None of the pre-existing corrosion previously reported has progressed beyond surface rust. Coatings 3 and 4 that have the Zero VOC topcoat are beginning to show significant fading. This unit was coated with "Corrosion X" CPC,

which is used by maintenance personnel to help reduce corrosion on assigned equipment. The "Corrosion X" CPC was removed using a General Purpose Detergent, 7930-00-926-5280, Fed Spec P-D-1747C, Class 1. The 920 MXS maintenance personnel provided this product.

Brunswick NAS, ME

De-Icing Truck Boom Cover Plate, Truck Registration # T-46

The overall appearance of the panel looks good. The panel had numerous scuffmarks and scratches in coating numbers 1, (DuPont powders), 2, (Morton powder with Zinc Rich primer), and 5, (base line coating). These discrepancies have not deteriorated beyond what was reported during our last visit. Pre-existing corrosion located in a seam weld area has not progressed beyond the surface rust previously reported.

Towing Tractor Hood, Registration # LTC-084

The overall appearance of the hood looks good. No major corrosion was noted during this visit. Prior to taking gloss and color measurement readings a road film needed to be removed. The hood was cleaned using a cleaner, Oasis 136, 7930-01-398-0955, manufactured by ECOLAB and rinsed with water. It was a mild detergent use by the Navy maintenance personnel. As previously reported coating 5, (baseline coating), had a small chip that went to the substrate; probable cause maybe a dropped tool. No corrosion was seen on the substrate. Coatings 1, (DuPont powders), and 2, (Morton powder with Zinc Rich primer), were worn and scratched on the leading edge corners; probable cause was standing on end prior to installation. None of these discrepancies show any creepage or under cutting of the coatings.

Metallized Support Equipment (Patrick AFB, FL)

We were asked to document the progress of support equipment, which were sprayed with Zinc/Aluminum 85/15 Metal Wire Arc Spray (MWAS). In 1999 the 920th MXS/LGMG, Aerospace Ground Equipment personnel sandblasted four pieces of support equipment due to severe corrosion. Each piece had to be blasted to a two mil anchor profile for the MWAS to adhere to the substrate. Once applied, the zinc/aluminum material would protect the steel substrate from corroding. The following is a brief summary of what we observed:

Aircraft Generator –86,

The generator had a dark gray appearance from the zinc/aluminum coating going active to protect the surface. No topcoat was applied to the unit to reduce the haz/mat materials used in paint operations. Several areas on the generator had bubbles the size of a half dollar. This is an indication of improper surface preparation. All areas, which had

been severely corroded, blasted, and treated with the zinc/aluminum coating had no presents of corrosion. Although some corrosion was present the zinc/aluminum was leaching out to prevent further migration of the corrosion. (Documented by photos).

F-2 Trailer

The trailer was severely corroded and was sandblasted on the top only as it was due for turn-in to DRMO. The top had the MWAS coating applied and was performing well with no corrosion. The underside was still severely corroded (documented by photos).

B-1 Maintenance Stand

The maintenance stand had minor corrosion in several areas where the MWAS coating did not adhere to the substrate. Grease and oil residue were over a good portion of the stand; a pressure washer is used to remove these contaminates. No topcoat is applied to the stand. (Documented by photos).

MC-2A Air Compressor

This unit was sandblasted, coated with MWAS, and topcoated with Mil-PRF-85285, polyurethane. There were some small areas which the MWAS began to fail but no major corrosion was detected. The topcoat was beginning to show visible signs of fading. (Documented by photos).

Note: All of our points of contract were very helpful during our visit. Special thanks to Ms Susan Misra for the help she provided during the inspections at each location and to CWO4 Klien and Chief Jobe who will not be available for our next visit in June as they are retiring from active duty.

Attached below are the color summaries for the white Navy panels at NAS Brunswick and on board the USS Abraham Lincoln.

Colorimetric Summary											
Test Coating	CIE LAB	Baseline Reading	6 Month Reading	Baseline Difference	6 Month ΔE	12 Month Reading	Baseline Difference	12 Month ΔE	18 Month Reading	Baseline Difference	18 Month ΔE
1	L*	95.380	99.263	-3.883		98.897	-3.517		#DIV/0!	#DIV/0!	
	a*	-1.557	-0.277	-1.280	4.089	-0.433	-1.123	3.810	#DIV/0!	#DIV/0!	#DIV/0!
	b*	1.910	1.907	0.003		2.850	-0.940		#DIV/0!	#DIV/0!	
2	L*	94.967	100.307	-5.340		100.793	-5.827		#DIV/0!	#DIV/0!	
	a*	-1.623	-0.093	-1.530	5.790	-0.320	-1.303	6.311	#DIV/0!	#DIV/0!	#DIV/0!
	b*	1.337	2.970	-1.633		3.380	-2.043		#DIV/0!	#DIV/0!	
3	L*	95.457	99.600	-4.143		98.787	-3.330		#DIV/0!	#DIV/0!	
	a*	-0.953	0.457	-1.410	4.774	0.590	-1.543	4.523	#DIV/0!	#DIV/0!	#DIV/0!
	b*	1.053	2.960	-1.907		3.697	-2.643		#DIV/0!	#DIV/0!	
4	L*	95.787	99.710	-3.923		98.063	-2.277		#DIV/0!	#DIV/0!	
	a*	-0.930	0.403	-1.333	4.438	0.543	-1.473	3.684	#DIV/0!	#DIV/0!	#DIV/0!
	b*	1.190	2.780	-1.590		3.683	-2.493		#DIV/0!	#DIV/0!	
5	L*	93.520	97.287	-3.767		98.807	-5.287		#DIV/0!	#DIV/0!	
	a*	-0.773	0.453	-1.227	4.009	0.120	-0.893	5.410	#DIV/0!	#DIV/0!	#DIV/0!
	b*	0.070	0.683	-0.613		0.790	-0.720		#DIV/0!	#DIV/0!	

6 month and 12 month Color Measurements on Panel Control # J-99-OC-014-11, NAS Brunswick, ME

6 Month Evaluation							
Test Coating	Reading #	L*a*b* Readings					
		L*	L* Avg	a*	**a* Avg**	**b***	**b* Avg**
1	1	94.280	93.747	-1.650	-1.637	2.46	2.893
	2	93.710		-1.700		3.01	
	3	93.250		-1.560		3.21	
2	4	92.730	93.483	-1.630	-1.553	2.51	3.293
	5	92.890		-1.580		3.31	
	6	94.830		-1.450		4.06	
3	7	93.600	93.410	-0.640	-0.713	4.48	5.383
	8	93.350		-0.770		5.75	
	9	93.280		-0.730		5.92	
4	10	93.340	93.407	-0.830	-0.833	4.17	5.19
	11	93.040		-0.800		6.2	
	12	93.840		-0.870		5.2	
5	13	93.860	92.273	-0.990	-0.907	1.24	1.73
	14	93.350		-1.010		1.45	
	15	89.610		-0.720		2.5	

6 month Color Measurement on Panel Control # J-99-OC-014-01, USS Abraham Lincoln