



NDCEE

National Defense Center for Energy and Environment

Example Transfers of Corn-Hybrid Polymer (CHP) Blasting Technology

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Presentation Outline

- **NDCEE Mission**
- **NDCEE Technology Transfer Approach**
- **CHP Technology Overview ***
- **CHP Demo and Transfer History**
- **Example Transfers**
- **Conclusion**

* - for additional details, see JSEM presentation: B Yallay, "Corn Hybrid Polymer Media for Coatings Removal from Delicate Substrates"

National Defense Center for Energy and Environment (NDCEE)

■ Mission

- Serve as a national resource for researching, developing and validating environmental, safety and occupational health (ESOH) technologies and processes
- Advance technology transfer aimed at reducing total ownership costs in support of national defense

The NDCEE was established to support DoD installations, ranges, weapons systems, and the warfighter in achieving performance advantages, enhanced efficiency, costs savings, and regulatory compliance.

NDCEE Technology Transfer

■ Technology Transfer Definition:

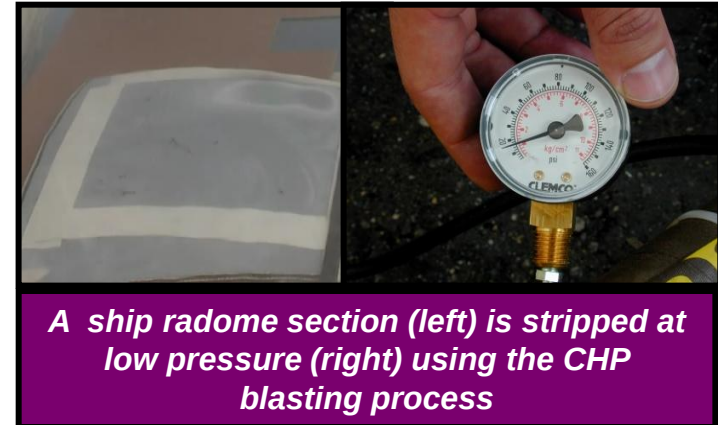
- *The activities necessary to field validated, cost-effective operational ESOH technologies for DoD installations and weapon systems*
 - Focus on actual fielding of technologies for operational use
 - Activities can occur over long period of time – multiple years and tasks

■ Two Basic Types of Transfer Efforts:

- “Initial” transfer : Transfer at the first demonstration / validation site
- “Lateral” transfer : Transfer at other relevant sites throughout DoD after successful initial demonstration / validation

Corn-Hybrid Polymer (CHP) Blasting Technology Overview

- **Description:** Low pressure blasting system for coating removal from delicate substrates using corn-hybrid polymer blast media
- **ESOH Need:**
 - Environmentally acceptable coatings removal
 - Improved human health by replacing manual sanding
- **Advantages:**
 - No substrate damage, resulting in the elimination of unnecessary rework
 - Blast medium is organic, nontoxic, biodegradable, classified as nonhazardous and generates minimal waste
 - Meets MIL SPEC (MIL-P-85891) for Type VII plastic media
 - Considered a “drop-in” replacement for many plastic media stripping systems (May eliminate the use of chemical strippers)
 - Preliminary ECAM cost savings range: \$20,000 - \$1.5 million, for various components and facilities (results available upon request)



Corn-Hybrid Polymer (CHP) Blasting

Suggested Transfer Approaches

■ Potential Transfer Sites:

- Sites with high labor cost for media blasting, manual sanding or chemical stripping
- Interested sites: Navy (4), Army (3), Air Force (1), Marine Corps (1), NASA

■ Transfer Barriers:

- Facility requires correctly sized, operational blast containment booths
- For drop-in replacement, Military Service must accept CHP as meeting MIL SPEC for Type VII media

■ Lateral Transfer Approaches:

- Installation level - address case-by-case interest:
 - Address media containment issues
 - Conduct site specific demonstrations as required
- Command level - seek broad Command-wide acceptance:
 - Identify Program Office POCs for approval support on selected weapon systems
 - Conduct Command-wide, high visibility demonstration / validation (dem/val) as needed
 - Seek funding support for dem/val from a variety of sources

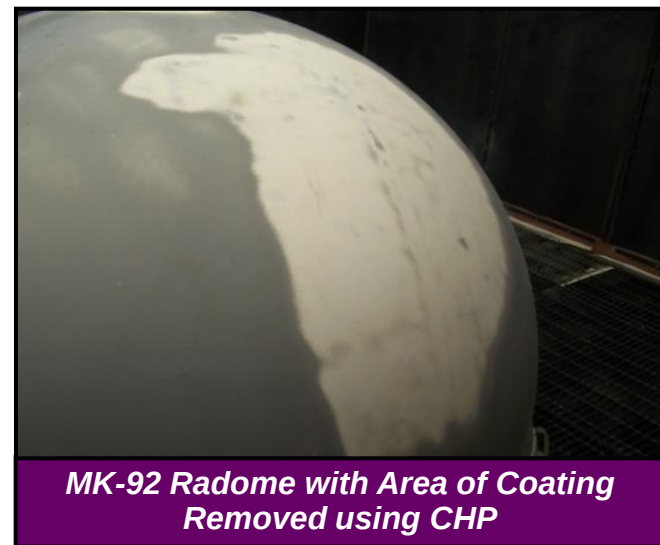
CHP Demo and Transfer History

DoD Site	Example Blasting Applications	Proof of concept	Dem / val	Transfer
Warner Robins ALC	C-130 radome, F-15 speed brake, other components	2005	2006	2008
NS Mayport *	Ship radome, antenna, Seahawk chopper	2006	2007	2008
NSB Kings Bay *	Periscope, sonar composites	2006	N/A	2006
Ft. Rucker (Contractor site)	H-60 parts, HMMWV hoods	2006	N/A	Open option
Ft. Bragg (Simmons AAF)	Aircraft composite and Al components	2006	N/A	Open option
NADEP Jacksonville *	Aircraft composite and Al components	2005	2006	2007
Corpus Christi Army Depot	H-60 blades, rotors, stabilators and other components	2008	2008	2008 (TBD)

* - To be described in more detail

Successful Transfer Example – NS Mayport

- **Testing effort:** Both proof of concept and acceptance dem / val tests
- **Applications:** Composite components and full airframe - UH-60 Seahawk
- **Status:** Appeared to be successful transfer, but site role as a Southeast Maintenance Center is changing – privatization now expected
- **Key Transfer Outcomes:**
 - Provided initial chance to evaluate CHP on-site
 - Labor savings: 55.5 hours/ large part (e.g. hand sanding a ship radome)
 - Led to idea for a potential “regional implementation” concept, using either Service staff (civilian or military) or a Service Contractor



Successful Transfer Example – NSB Kings Bay

- **Testing Effort:** Only proof-of-concept tests
- **Applications:** Periscope ferrings, composite sonar window, other composites
- **Status:**
 - Rapid conversion from plastic to CHP, drop in replacement
 - Workforce: Navy staff (civilian)
- **Key Transfer Outcomes:**
 - First submarine application
 - No dem / val required – immediate transfer



Successful Transfer Example – Fleet Readiness Center SE (NADEP Jacksonville)

- **Testing:** Both proof-of-concept and acceptance dem / val tests
- **Applications:** P3 composite radomes, other A/C composite components
- **Status:**
 - Operational for radomes and other parts
 - Workforce: Navy staff (civilian)
- **Key Transfer Outcomes:**
 - Modified existing blast booth to accommodate CHP media
 - Considering expansion to other aircraft parts



Conclusion

- **CHP illustrates both successful vertical and lateral transfer practices** – *aided by core NDCEE CHP team actions over nearly 3 years*
- **Technology Transfer requires leadership, the right conditions and a persistent commitment to action**
 - A committed end-user with a valid ESOH need
 - A mature, appropriate, usable technology solution
 - Attention to unique hurdles to be overcome in each situation
 - Appropriate and sometimes leveraged funding or information
 - A Service transfer champion (at appropriate level, e.g. depot, Command, Headquarters)
- **Further potential exists for more widespread use of CHP throughout DoD**
- **Technology Transfer is a Contact Sport**

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