



# **NASA TEERM Project**

**Corn Based Blast Media**

Technology Evaluation for Environmental Risk Mitigation  
Principal Center

Program Manager : **Chuck Griffin**



# What is NASA TEERM?

- The Technology Evaluation for Environmental Risk Mitigation Principal Center (TEERM)
- Identifies and validates sustainable pollution prevention technologies through joint activities
- Reduces risk while minimizing duplication and associated costs.
- Commonly involves two or more NASA stakeholders
- Collaborative approach benefits project members in multiple ways:
  - Resources are shared
  - Increases technical confidence
  - Improves the overall technical quality
  - Accelerates implementation



# TEERM Partners

## NASA:

- Shuttle Environmental Assurance (SEA) Initiative
- Constellation Program
- KSC Corrosion Laboratory
- Regulatory Risk Analysis and Communication (RRAC) Principal Center
  - Benefits through identification of future risks to mission.
- Recycling and Affirmative Procurement (RAP Principal Center
- DOD (JG-PP, AF Space Command)
- International (C3P, ESA)



# NASA Refurbishment Activities

- Coatings removal is a necessary part of the maintenance, repair, and overhaul activities at many NASA centers and contractor support sites.
- Sensitive substrates, such as composites and thin aluminum alloys require special handling such as the use of chemical stripping , pneumatic hand sanding, or softer blast media.
- Type V, acrylic based PMB is commonly used to de-coat, strip, or de-paint the delicate substrates of the Solid Rocket Boosters (SRBs) currently used in support of the Shuttle and slated to be used in support of CxP.
- Strict quality control.



# Plastic Media Blasting (PMB)

## Advantages:

- Used primarily for de-coating processes which include delicate/sensitive materials (alloys, composites, etc)

## Disadvantages:

- Derived from petroleum.
- Combustible!
- Visual inspection concerns
- Utilizes impact energy alone to remove coatings
- Consistent quality?



# Corn Hybrid Polymer blast media (CHP)

## Advantages:

- A “manufactured”, “extruded “ product – quality control
- Compatibility with all commercially available plastic media blast systems
- Moisture resistance
- Longer product life
- UV fluorescence aids inspection
- Effective on composite materials and most metallic surfaces, meets MIL-P-85891
- Improved environmental and worker safety, non combustible

## Disadvantages:

- Not readily known



# Project Goals

- Qualify and Validate corn hybrid polymer with interested stakeholders.
- Implementation at NASA Centers and at NASA Contractor facilities



# Partner Description

## Current Potential Stakeholders:

- NASA
- KSC, MSFC
- C3P
- USA
- ATK Thiokol
- ADM
- Midvale Technologies





# CHP Benefits Summary

- CHP eliminates risks associated with environmental, safety, and health concerns regarding the use of sanding and chemical coating removal.
- Reduces costs by lasting longer and requiring less frequent blast booth filter change outs.
- Potential for process elimination regarding the current post-blast chemical wipe-down procedures (source 2008 Battelle assessment)



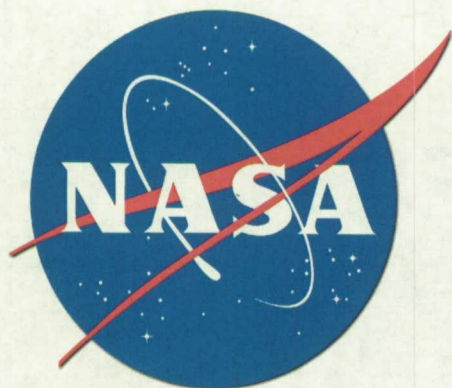
# CHP Benefits Summary Cont.

Meets Section 9002 of the Food, Conservation, and Energy Act of 2008, otherwise known as the 2008 Farm Bill (Public Law 110-234) (source: USDA BioPreferred Prog)

- Leverage DoD studies thus reducing duplication of effort and costs.
- Potential for improved visual inspection process, resulting in minimized risk to mission
- Process affords a high degree of control when needed.



# Questions?



National Aeronautics and Space Administration

**Technology Evaluation for Environmental  
Risk Mitigation Principal Center**





# **BACK UP SLIDES**



# References

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# Solid Rocket Booster (SRB) refurbishment

The boosters (with aft skirts still attached), frustums, and parachutes are recovered by two SRB retrieval ships: the *Liberty Star* and *Freedom Star*.





# KSC Corrosion Control Facility

The frustrum, aft and forward skirts, and the ETA ring is processed using PMB at the CCF at Ransom Road.





# KSC Corrosion Control Facility

SRB Aft Skirt after media blasting at the CCF.



Image from ITB Inc.

May 12, 2009





# Nozzles and SRB Case Segments

The nozzles and the spent SRB case segments are shipped via rail to ATK Thiokol.





# ATK Thiokol, Clearfield Utah

Refurbishment of the SRB motor segments is performed at ATK's Utah location.





# A Need Within NASA

There is a need within NASA to:

- care for our environment, while meeting exacting standards
- meet Federal requirements
- find potentials for process improvements and cost benefits
- implement processes which do not require new training or extensive equipment changes.

**REPORT DOCUMENTATION PAGE**

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