Environmental Program Branch

Waste Management Proposal For Inorganic Zinc Paint Waste

December 2005

OUTLINE

- PROBLEM STATEMENT
- BACKGROUND
- NASA/USA WASTE MANAGEMENT PROPOSAL
- PROPOSED WASTE MANAGEMENT PROCESS (VISUALS)
- CONCLUSIONS

PROBLEM STATEMENT

- *Inorganic Zinc Paint*
  - Generation of Waste Stream
    - Caused by delays and work stoppages due to inclement weather conditions
    - Produces 80% of IO zinc waste volumes
- *Off-gassing*
    - Releases VOCs, hydrogen gas and CO_2 as by-products of mixture
    - Uncured materials cause bulging of waste drums when closed
    - Occurs in solid *AND* liquid waste streams (if residual solids are present)
    - Paint Manufacturer's guidance specifically address bulging and off-gassing associated with personnel safety concerns
- *Regulatory Requirements*
    - Under RCRA, waste containers are to be closed -- opened only to add or remove waste
    - Subpart CC and CAA rules for VOC emissions conflict with MSDS guidelines and accepted safety rules

BACKGROUND

- *CURING PROCESS*
  - Once mixed, off-gassing continues until fully cured
  - A 1-gallon IO zinc kit can take weeks or longer to cure in original container
  - Without a vent, drum bulging occurs within a few hours
  - 55-gallon drums (with vents) could take months to fully cure
    - ♦ Thick layers and smaller surface areas take much longer to cure
  - Larger surface areas (in thin layers) allow overnight curing
  - Containers must remain open to allow for complete curing

Inorganic Zinc Paint Plan

USA's K6-1896 (Construction Management) 90 day Hazardous Waste Site

CURRENT PRACTICES

- Solid materials collected as a hazardous waste in drums with relief valves installed
  - Zinc is very heavy, drums are filled half-full due to container weight limitations
- Liquid waste stream, after proper decantation, is collected & managed as a hazardous waste, with relief valves installed
  - Relief valves must be removed prior to shipping to KSC's TSDF
- JBOSC also installs pressure relief valves and gauges at the TSDF
  - While in storage, this requires TSDF personnel to monitor waste containers after 90-day limit

NASA/USA WASTE MANAGEMENT PROPOSAL

- Submittal of permit letter requesting a Title V Air Permit Insignificant List (activity # 6) language change, amending as follows:

  ➡ replace "Mixing/Coating Operations, including the emissions from the air drying of empty cans and excess two-part epoxy paints prior to their disposal"

  ➡ with "Mixing/Coating Operations, including the emissions from the air drying of empty cans and excess two-part ***convertible coatings*** prior to their disposal"

- ***This would allow the inclusion of inorganic zinc coatings***
- **Maximum VOCs from IO Zinc operations: 3.348 TPY**
  - –Refer to calculation sheet for additional data
- If approved, USA operations will segregate and cure paint at field worksites, or (occasionally) at the K6-1896 hazardous waste facility

NASA/USA WASTE MANAGEMENT PROPOSAL

- Liquids will be decanted to allow for the in-process segregation of liquids and solids
  - –Segregation of liquids and solids will generally be completed overnight, using loosely covered containers, in a controlled, weather protected area designated by USA
  - –Liquids will be separated (decanted) and managed as hazardous waste and removed to the K6-1896 hazardous waste site NLT COB daily
- If approved, ALL mixed unused inorganic zinc solids/slurry will be allowed to cure, as follows
  - –Placed in a loosely covered container, in a controlled, weather protected area designated by USA. Trays, with larger surface areas, are preferred over 5 gallon containers, as shown in the photos.
  - –Thin layers cure overnight, and will be removed the next business day, and managed in accordance with PWQ/TRP guidance

NASA/USA WASTE MANAGEMENT PROPOSAL

- Cured material will be placed in approved containers for off-site disposal, or as directed, in containers for recycling or landfill disposal

- USA environmental will immediately provide specific training and guidance to involved USA and subcontractor personnel

PROPOSED WASTE PROCESS

Covered, Lined Cure Pan

PROPOSED WASTE PROCESS

Pouring Waste IO Zinc Paint Into Lined Cure Pan

PROPOSED WASTE PROCESS

Solid, Partially Cured IO Zinc Added To Cure Pan…

PROPOSED WASTE PROCESS

…Must Still Be Broken Into Smaller Pieces To Finish Curing

PROPOSED WASTE PROCESS

Placing Cured IO Zinc In Container For Disposal

PROPOSED WASTE PROCESS

Preparing Cure Pan For Reuse and
A Container Of Cured IO Zinc Paint

CONCLUSIONS

- KSC/USA is one of largest users of IO zinc paint in Florida
- KSC and its contractors strive to minimize the generation of excess material through weather forecast monitoring, limiting pot sizes, and managing scheduled work times
  - Price/gallon of IO zinc paint: $28 to $32
- Currently, USA is continuing corrosion control operations in the ***safest*** manner possible
- NASA/USA request timely consideration and response, in light of the safety and environmental compliance issues involved
- Approval of this proposal will substantially reduce or eliminate the risks to personnel, and will protect life, property, and the environment

Inorganic Zinc Paint Plan