

SP-1 Update

Environmental Technologies Panel

**Addressing the SP-3 Panel
Surface Preparation and Coating**

October 1, 2008

Johnstown, PA

Environmental Technologies Panel Steering Committee

- Donna Elks – EB - Chair
- Mike Chee - NASSCO
- Vince Dickinson - BIW
- Shaun Halvax – BAE Systems SDSR
- David Kopack – NAVSEA
- Frank Thorn – NG Newport News
- Alan Spratt – Vigor Industrial

- Personnel from academia and consulting firms will be asked to participate in meetings to provide input

2009 ETP Whitepaper Submittals

- **Energy and Cost Savings from Replacement of Incandescent Lamps with CFLs in Temporary Lighting**
- **MAEE Capture Efficiency Enhancement**
- **Complying with New USEPA NPDES Vessel General Permit Regulations and Storm Water Management in Shipyards**
- **Field Demonstration of Nanovapor Vessel Degassing Technology**
- **Environmental Life Cycle Analysis for Shipyard Painting and Stripping Operations Costs**
- **Developing Emissions Factors for Electrodes Commonly Used within the Shipbuilding Industry for use in Regulatory Reporting Procedures**
- **Robust Universal Environmental Enclosure System**

2009 ETP Whitepaper Submittals

- **Formaldehyde Testing in a Shipyard**
- **Shipyard Pollutant Source Controls and Facility Baseline Pollutant Testing Protocol Development and Verification**
- **Vessel General NPDES Permit Applicability to Shipyard Vessels and Operations Workshop**
- **Understanding Aquatic Toxicity for Shipyard Environmental Managers Manual and Workshop**
- **Drydock NPDES Compliance: Understanding and Addressing the Impacts of the Vessel General Permit**
- **Aquatic Toxicity and NPDES Toolkit**
- **A Greenhouse Gas Inventory Toolset for the Shipbuilding and Ship Repair Industry**

2009 ETP Whitepaper Selection

- **Vessel General NPDES Permit Applicability to Shipyard Vessels and Operations Workshop**

(BAE Systems – Norfolk Ship Repair and CH2M-Hill)

(Project Cost: \$ 28,000 + \$ 16,085 Cost Share - BAE)

(40% Weighting Factor)

- **Developing Emissions Factors for Electrodes Commonly Used within the Shipbuilding Industry for use in Regulatory Reporting Procedures**

(Concurrent Technologies Corporation)

(Project Cost: \$ 92,100)

(60% Weighting Factor)

Whitepaper projects will be presented before the ECB on November 6th to determine if they will be funded.

NPDES Vessel General Permit Whitepaper

Proposer Identification: BAE Systems Ship Repair Norfolk and CH2M- HILL.

Concept Description: Perform an analysis of the applicability of the Vessel General NPDES Permit (“VGP”) to shipbuilding and ship repair facilities, both public and private, in the US. Using this analysis, prepare the following:

- Plain English guide to shipyard implementation of the regulatory requirements.
- Develop all required checklist, forms and reports necessary for a shipyard to implement the requirements and demonstrate compliance.
- Develop VGP workshop materials including manuals and presentations that can be used by shipyards, ship repair organizations and regulatory agencies to provide compliance guidance on the VGP.
- Present workshop for ship builders, ship repairers, and associated waterfront businesses in the Port of Hampton Roads, in conjunction with BAE Systems Ship Repair Norfolk.

Emissions Factors for Common Shipyard Electrodes for Regulatory Reporting

Proposer Identification: Prime contractor: Concurrent Technologies Corporation (CTC); Team Members: Penn State (ARL) and Softek Systems, Inc.; Participating Shipyards: BAE Systems NSR, Bath Iron Works (BIW), and others TBD.

Concept Description: This project seeks to identify electrodes that are commonly used for welding in all types of shipbuilding activities (repair, new construction, submarine, surface vessel, etc.) and prioritize them based on a) their overall use, b) lack of current high quality emission factors and c) potential for emitting Hexavalent Chromium and Manganese, the primary constituents driving shipyard offsite public health risks.

- Identify welding electrodes that are commonly used within the industry and determine those that currently lack high quality emission factors.
- Review the identified electrodes to determine their potential to emit Hexavalent Chromium and/or Manganese - the primary constituents driving shipyard offsite public health risks.
- Develop high quality emission factors for the selected electrodes that will be accepted by the U.S. EPA for use in regulatory calculating and reporting.

NSRP Comments to EPA Concerning the NPDES Vessel General Permit

On July 31, 2008 comments seeking clarification of issues associated with the new EPA NPDES Vessel General Permit (VGP) were submitted on behalf of NSRP.

Those comments were draft and submitted by John Wittenborn (Kelly-Drye & Warren) with the assistance of BAE-SDSR, Atlantic Marine, NASSCO, and others.

The comments sought clarification on 3 major areas that EPA did not clearly address in the original draft rule. The NSRP comments sought to influence EPA's interpretation and resolution of the unclear issues involving specific discharges. NSRP's position on those discharges was as follows:

Incidental Discharges from Vessels Under Construction should be Regulated by the VGP when the Vessel becomes Waterborne

Incidental Discharges from Vessels Undergoing Maintenance or Repair in Dry Dock should be Regulated by the Vessels' VGP

Incidental Discharges from Floating Dry Docks should be Regulated by the VGP

Evaluation of Welding Electrodes to Determine the Mass Fraction and Decay Rate of Hexavalent Chromium

On Sept. 18, 2008 the afore-referenced report was submitted to EPA. The report was a result of a RA project recently concluded by CTC and Team.

The NSRP ETP has worked with EPA for a number of years on the Shipbuilding and Ship Repair Residual Risk rule.

As part of the US EPA's Residual Risk Assessment for the Shipbuilding and Ship Repair source category the EPA has focused on emissions from welding operations.

In the interest of developing relevant data the NSRP has funded a project to develop welding data from actual shipbuilding welding processes.

The processes and the test methodology utilized are consistent with those used and accepted by EPA.

The primary focus of this report is on the ratio of hexavalent chromium (CrVI) to total chromium (Cr) and the decay rate for the conversion of CrVI to the more stable CrIII. In addition, analysis was conducted for iron (Fe), copper (Cu), nickel (Ni), vanadium (V), lead (Pb) and manganese (Mn) for use in emission factor development.

Current On-going ETP Panel Projects

In 2007 the ETP received funding through the ECB for one panel project that is entitled “Oil Handling Activities Best Management Practices (BMP) Guidebook for Shipyards. The project is scheduled to be completed and presented at the next ETP meeting in Feb. 2009. O’Brein & Gere Engineers is the project lead.

- **This project is for assisting with the preparation of a Shipyard Oil-Handling BMP Guidebook pursuant to the USEPA’s amendments to the Oil Pollution Prevention & Response rule and the USCG’s Oil & Hazardous Material regulations. Therefore, the primary regulatory focus is on:**
- **33 CFR 155 – Oil or Hazardous Material Pollution Prevention Regulations for Vessels**
- **33 CFR 156 – Oil and Hazardous Material Transfer Operations**
- **40 CFR 112.8 – SPCC Plan requirements for onshore facilities**

CURRENT COMMON ISSUES

for the

Environmental Technologies Panel

and

Surface Preparation and Coating Panel

EPA's Residual Risk Analysis

**How it will Affect Surface Preparation Operations
and Environmental Management**

Residual Risk Process

- In 2002 EPA began evaluating Residual Risk after promulgation of the original NESHAP for Shipbuilding and Ship Repair
 - Required under the Clean Air Act Section 112(f)
 - EPA evaluates the risk remaining (“residual risk”) after the application of controls mandated by original rulemaking
 - To be conducted within 8 years of rule promulgation
- Original NESHAP regulates emissions from painting operations only
- Residual Risk began looking at additional sources:
 - Blasting
 - Welding
 - Solvent usage and coatings

Residual Risk Process

- EPA began with a screening process to gauge if potential risk existed
- Data used by EPA consisted of 1998 NEI data which was:
 - Not up to date
 - Not complete for all facilities
 - Not consistent for every facility due to variances in State requirements for reporting
- EPA used consumption information for weld rod usage, blast grit usage and coatings usage, where available
- Applied EPA emission factors (AP-42) to calculate emissions
 - Assumed 33% of the total chromium was hexavalent chromium
 - Overestimating emissions of hexavalent chromium which is the risk driver for cancer

Residual Risk Process

- Additional assumptions made for release rates and locations of releases (building heights and locations)
 - blanket worst-case assumption that all emissions were from one stack at fence line
- All data entered into a standard modeling tool with meteorological and census data (Human Exposure Model (HEM))
- The model results predict the potential cancer and non-cancer impacts on the community

Residual Risk Screening Results

- Based on the screening analysis,
 - 7 shipyards triggered the cancer threshold of greater than one per million chance of an increased incident of cancer
 - 5 shipyards screened above the non-cancer threshold demonstrating a Hazard Index of 1.0 or greater
- Driving the risk was determined to be:
 - Cancer → Hexavalent chromium (Cr(VI))
 - Non-Cancer → Manganese and Nickel (Mn and Ni)
- The emissions are generated from:
 - Welding
 - Blasting

Residual Risk Surveys

- In 2003 EPA sent surveys to 13 shipyards covering various work scopes and geographic regions to gather specific information on:
 - actual usage,
 - Emission factors
 - location of usage,
 - release information and
 - facility information (including maps with latitude and longitude identifying emission locations)

Residual Risk Surveys

- The 13 yards surveyed were:
 - Jeffboat, LLC
 - NASSCO
 - Bath Iron Works
 - Newport News Shipyard
 - Northrop Grumman – Ingalls
 - Northrop Grumman – Avondale
 - Northrop Grumman - Gulfport
 - Atlantic Marine
 - Alabama Shipyard
 - Gunderson
 - NORSHIPCO
 - San Francisco Dry Dock
 - Norfolk Naval

Residual Risk Survey Results

- The surveys revealed that data provided by shipyards varied greatly and there was no consistent means of estimating emissions
- As a result, in 2004 EPA developed their own emission factors to apply to all shipyards which were presented to industry
- The emission factors were developed from:
 - Factors provided by shipyards
 - References in EPA's AP-42 Emission Factors Document
 - Two NSRP reports
 - California Air Resources Board (CARB) Report
 - EPA procedure for developing factors when no testing was available

Residual Risk Team

- The SP-1 Panel developed a team with White Paper funding to represent the industry realizing the possible future regulation of welding and blasting
- Team members included shipyard and trade representatives, legal counsel and a risk assessment expert
- Shipyard Reps
 - Vince Dickinson – BIW (Co-Lead)
 - Mike Chee – NASSCO (Co-Lead)
 - Wayne Holt – Atlantic Marine
 - Frank Thorn – NGNN
 - Shaun Halvax – BAE-San Diego
 - Mike Host - NNSY

Residual Risk Team (cont'd.)

- Trade Reps
 - Frank Losey / Stacy Ballow – ACA
 - Dan Youhas / Ian Bennett – SCA
- Risk Expert
 - Valorie Thompson – Scientific Research Associated
- Legal Expert
 - John Wittenborn – Collier Scott Shannon
- Concurrent Technologies
 - Georgette Nelson
 - Chuck Tomljanovic
 - Joe Jackens
 - Tiffany Belz

Residual Risk Team Mission

- The team focused on:
 - Reviewing and commenting on EPA emission factors
 - Ensuring EPA was using the best available data for the sites being modeled
 - Coordinating the collection and submission of additional welding and blasting data to EPA
 - Overall, reviewing EPA methodology to ensure the most reasonable approach

Team Results

- Over the duration of this project, team members held 6 meetings and over 20 conference calls with EPA
- Various team members conducted over 40 direct contacts with EPA personnel
- In the end, the team was able to impact the outcome of this rulemaking

Residual Risk: Welding

- For emission factors EPA used 95% UCL
 - Tends to skew data when there is limited number of data points
- Used maximum single data point for lead and applied to all electrodes, regardless of electrode contained lead
- Some factors set by EPA were higher than the actual metal content of the electrode
- Shipyards again provided a significant amount of data

Residual Risk: Welding

- As the second whitepaper project wound down, CTC received RA funding
- CTC Project developed new emission factors for high use rods based on actual testing
 - BIW
 - Atlantic Marine
- Identified and demonstrated control technologies
- All protocols reviewed by EPA prior to testing for comment and acceptance

Residual Risk: Blasting

- The EPA proposed emission factors for blasting were based on Total Particulate Matter Emission Factors from an NSRP study by Dr. Kura at UNO.
- These factors were then compared against limited data on metal content in abrasives from 2 reports:
 - KTA report
 - NIOSH Study
- EPA was extrapolating hexavalent chromium emission factors based on a single coal slag sample
- Based on this sample EPA assumed that 21% of all chromium (Cr) was Cr(VI) for all abrasive types!

Residual Risk: Blasting

- Based on this data and the assumption of percent hexavalent chromium, a yard using 1,000 tons of coal slag would emit:
 - 89,339 pounds of chromium, and
 - 30,375 pounds of hexavalent chromium
- Something was not adding up!

Residual Risk: Blasting

- The team reviewed and commented on several studies the EPA was using to develop blasting emission factors
- The group provided to EPA blast grit data from:
 - MSDS data
 - abrasive specific laboratory results
 - Usage data
- Data submitted for all blast media used by the industry:
 - Coal slag
 - Garnet
 - Steel shot
 - Aluminum oxide
 - Copper slag

Residual Risk: Blasting

- EPA has been reluctant to accept the industry data but rather relied on the two initial reports by KTA and NIOSH
- There have been some indications from EPA that they need to consider the data provided by the shipyards, but . . .
- “The Jury is still out”

Where Are We Now

- EPA published the *Advanced Notice of Proposed Rulemaking (ANPRM)* on March 29, 2007
 - 60 day comment period asking for public comments on modeling assumptions including data and emission factors
 - Comment period was extended for an additional 90 days
- The team submitted comments on behalf of the industry and made those comments available to the shipyards for their use
- Comments focused on:
 - Shipyard flexibility for compliance
 - Site-specific data
 - Modeling assumptions, including emission factors
 - Ways out – how a facility may be exempt if the demonstrated risk is below threshold, similar to other rules

Where Are We Now

- Specific comments were made on:
 - Making chromium assumptions based on a single data point;
 - Using Industry supplied data in developing emission factors

Where Are We Now

- Once final rule is developed sources may be forced to look at alternatives:
 - Blast media
 - Capture and treatment of emissions
 - Alternative technology research
 - Work practices
- Expected to be published in the Federal Register in the Spring of 2009
- Indications are that EPA is conducting an internal review of the data used both for blasting and welding risk assessments
- Again the public will have the opportunity for comment

Where Are We Now

- Will blasting be addressed in this rule-making?
 - Conversations with EPA focused on the fact that emissions from welding and blasting are a concern
 - It is unclear if these emissions will be included in the Residual Risk rule.
 - It appears that these emissions will be addressed whether in this rulemaking or a later in new rule

Questions?