ASSET PROTECTION THROUGH MAINTENANCE PAINTING PROGRAMS

Ryan Webb
Manager – Engineered Programs
The Brock Group
Reasons for Painting

- **Corrosion Control**
  - Steel Loss & Safety
  - Product Quality
  - Production Down Time
- **Aesthetics**
  - Public Image
  - Customer Image
  - Housekeeping
  - Employee Morale
- **Preventative Maintenance**
  - Discretionary (Work Orders)
  - Planned (Program)
Painting Philosophies - Consequences

- Worst Items First – *Reactive, High Dollar*
- Most Visible Areas – *Ignores potential problems*
- Easiest Access – *Unskilled, Quality concerns*
- Paint by Piece – *Inefficient, Higher Cost*
- Block Painting – *Efficient work, Lowers cost*
- End of Coating Life – *Optimum Time, Cost Effective*
- Preventive Maintenance – *Lowest Cost*
Painting Philosophies – Reality

- Mixture of Different Philosophies
  - Visible Areas as only one ingredient
  - Majority Block Painting vs Painting by Piece
  - Evolution from
    - Worst Items to
    - Optimum Time to
    - Goal of Preventive Maintenance

- Knowing When and How Much to Paint
Painting Programs

Why Use One

- Corrosion Control
- Aesthetics
- Preventative Maintenance

**Goal:**
Maintain Condition levels in an Acceptable Manner based on:
- Owner Expectations of Conditions and Aesthetics
- Industry Standards
- Cost-Effective Painting Practices
Maintenance Painting Programs

Why use one? Corrosion Control

Corrosion Control at Accumulator

Heavy Corrosion on Vessel
Maintenance Painting Programs

Why use one? Aesthetics

Hi-Visibility Tanks near the Road

Improve lighting
Maintenance Painting Programs

Why use one?  
End Of Service Life

Extensive Chalking Showing Primer

Top Coat Erosion
Maintenance Painting Programs

Why use one? Preventive Maintenance

Exchangers & Piping

Spot Prime and Overcoat Piping
Maintenance Painting Programs

- **Concept**
  - Protect More Square Footage while Spending Less on Painting and Surface Preparation
  - Eliminate the Need for costly Steel Replacement

- **Philosophy**
  - Systematic Monitoring of conditions
  - Developing a Long Range Plan, but use a Short Term Schedule.
  - Schedule painting at the Optimum time for the most Cost-Effective painting effort.
  - Paint complete areas, called “Block Painting.”
Engineered Approach

- Determine the Objectives
- Organize the Assets
- Assess the Assets
- Quantify the Assets
- Estimate the Maintenance Cycles
- Select a Catch-Up Philosophy
- Develop a Schedule Selection Process
- Decide on Measurements
- Develop a (Re)Inspection Plan
Painting Programs

3 Phases

- **Objectives**
  - Questionnaire (what to include / exclude)
  - Tracking method (Divisions, Cost Centers)
  - Limitations (Dollars, Years)
  - Expectations (Condition, Aesthetics)

- **Survey**
  - Baseline Conditions
  - Quantities (Square Feet of Surfaces to Paint)

- **Implementation**
  - Working the plan
  - Recording the work
Painting Programs
Survey

- **Boundaries**
  - Dividing the plant into Painting Jobs
    - *Block* (Units or along Roads)
    - *Sub-Blocks* (Sub-divide into scopes, piperacks, process area, tanks, etc.)
    - *Sections* (sub-divide by rigging, process, environment, size, condition, etc.)
Plot Plans with Boundaries
Painting Programs
Survey

Assessment

*Five Criteria*

- Environment - type & severity of environment
- Visibility - where Image is Important
- Corrosion Pct - rated by Pct of Corrosion SSPC Vis 2
- Corrosion Type – Aggressiveness of Corrosion
- Priority - ranked by Cost Effectiveness
Condition Analysis - Corrosion

**Type of Rust:**

A  None or Minimal Rust
B  Surface Rust
C  Pinhole Rusting or Edge Corrosion
D  Undercutting or Mill Scale
E  Pitting or Rust Nodules
F  Perforations or Stratification

**Percent of Rust:**

- SSPC – VIS 2 Standard Method of Evaluating Degree of Rusting on Painted Steel Surfaces
Condition Analysis - Rust Types

A – No or Minimal Rust

Type B - Surface Rust

Type C – Edge Corrosion

Type D - Undercutting

Type E – Pitting/Rust Nodules

Type F - Perforations/Stratification
Assessment Report

Block: 01 Olefins 6
Subblock: E Refrigerant and Cold Fractionation
Section: 12 Process Area

Environmental Exposure: E - Exterior
Environmental Rating: 2 - Severe
Visibility: 6 - Low Traffic/Visibility

Corrosion Rating: 4.0 - 10% Rust
Priority: 4 - Substandard Coatings

Environmental Codes:
- CF - Cooling Twr Fallout
- SW - Sweating

Pitting and Coating Failure on Piping
Painting Programs

Survey

- **Budgeting**
  - Square Foot Quantities
  - Type and Difficulty of Work
  - Surface Preparation required
  - Paint System for the environment
  - Productivity
Painting Programs

Survey

- **Schedules**
  - Options in Scheduling
    - Meet Square Foot Target
    - Spending Limitation (Dollar Target)
    - Worst First (based on Corrosion level)
  - Priority List (based on Cost Effectiveness)
Painting Programs
Survey

- **Scheduling Procedure**
  - Computer Program generates a Schedule
  - It is Modified for Common Sense (Bundling)
  - Try for a Good Mix
    - Levels of Corrosion
    - Types of Work Scopes
    - Degrees of Difficulty
## Managing the Mix

**Target Sq. Ft.:** 250 k

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**Target $$ :** $800 k

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Domino Effect of Deferment

Surface Preparation = 50% to 70% of Painting Costs

Deferment: Increases the Percent of Surface to Prepare

By Deferring Painting work, you are pushing back all succeeding work scheduled now or in the future, so in subsequent years, conditions are worse and costs are higher.
Painting Programs

Implementation

- **History**
  - Recording what was painted, when, by whom, with what, for what cost and hours

- **Updating Program**
  - After Completion of Painting Job
  - Follow Up (12-18 months after painting)
  - Based on Audit Cycle (Environments and Visibility)
Painting Programs
Implementation

- **Scheduling**
  - Short Term Schedule: 3 - 5 Years
  - Review Schedule every year when preparing for the next year’s Budget
  - As current year’s painting is complete, add another year to the back end
Painting Programs

Implementation

- **Measurements**
  - Determine important Measurements (Cost, Productivity, Safety, Schedule adherence, etc.)
  - Track and Report Trends

- **Re-Engineering the Program**
  - Review the Status every 3-5 years
  - Review the Objectives
  - Update the Processes as needed
Projected Improvements

Good – Acceptable Condition

Year 0

Year 5

Acceptable - Migrated
Good - Acceptable
Poor
Poor - Painted
Bad
Bad - Painted

Poor - Bad Condition
Painting Program Benefits

- **Corrosion Control**
  - Through Identification And Monitoring
  - Reduced Steel Loss
  - Eliminating Blasting

- **Better Long Range Planning**
  - Multi-Year Plan
  - Flexible Schedule

- **Increased Cost Effectiveness**
  - Program Painting vs. Work Orders
  - Scheduling at Optimum Time

- **Results:**
  - Improved Condition Of Plant
  - Lower Cost Of Painting
  - Paint More SF For Painting Dollars
  - Improve Appearance Of Plant
How to Make it a Long Term Success

- Plant-Wide Commitment
- Using Data Base for Decisions
- Maintaining Reliability of Records
- Allowing Program and Process to Mature
ASSET PROTECTION THROUGH MAINTENANCE PAINTING PROGRAMS

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