Corrosion Management: & Perspectives in Marine Applications

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IMPACT Study Launched October 2014

The IMPACT study:

- Updates the global cost of corrosion
- Assesses corrosion management practices
- Corrosion management templates
- Financial tools
- Benchmarking
Most Critical Findings of IMPACT Study

- A change in how decisions are made is required
- Continue investment in technology for corrosion control
- Corrosion Management System Framework
- Justify corrosion control actions by business impact
Corrosion Control Programs

Do you have one? Which one?

- Asset Integrity Management System (AIMS)
- Integrity Management System
- Corrosion Control Program
- Corrosion Control System
- Corrosion Engineering
- Corrosion Management
Corrosion Engineering

“Combating corrosion through proper materials selection, environmental control, and design”

An Introduction to Asset Corrosion Management in the Oil & Gas Industry
by Dr. Ali Morshed
Corrosion Management

- A Synonym for Corrosion Engineering?
- Corrosion control through corrosion engineering?
- Definition: “The process of reviewing the existing Integrity Management measures, regular monitoring of their performances, and assessment of their effectiveness post-commissioning.”

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Corrosion Management

- Should include Corrosion Engineering and Corrosion control efforts comprised of policies, processes and procedures that address corrosion across the complete lifecycle of the asset, from design to decommissioning.

- A Corrosion Management Program must include an accepted philosophy within the organization and ingrained into the corporate culture.

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Corrosion Control Program

Corrosion Control Program Benefits
- Satisfy regulatory requirements
- Ensure safe operation of assets
- An effective Corrosion Control Program requires a relatively small investment compared to the potential return on that investment

Sustainability
Corrosion Management

• Asset Integrity Management
• Overarching and encompassing all aspects of corrosion control including the use of coatings
• Methods can be widely varied
• Corrosion Engineering vs. Corrosion Management
• NACE International IMPACT Study and IMPACT Plus Tool
• Sustainability
Current Industry Mindset?

Corrosion is a cost of doing business
Corrosion Management

...Identify Corrosion as a RISK

- ISM Safety Management Code doesn’t Identify Corrosion as a RISK
- Autonomous & Smart shipping may place a greater need on Corrosion Engineering and Management systems
Corrosion Management

...Identify Corrosion as a RISK

• Cybersecurity being identified as a RISK and work there may serve as a model in having Corrosion identified as a RISK as well
Corrosion Management

...Identify Corrosion as a RISK

• Smart Ports – Today’s ports experience a high reactivity model to Corrosion issues

• Need for Education
• Financial Modeling
Corrosion Management

- Program Elements¹
  - Identification of Corrosion Threats
  - Life-Cycle Cost Analysis
  - Corrosion Control Strategies
  - Corrosion Monitoring and Inspection
  - Program Performance Review and Management

- Corrosion Prevention Systems
  - Protective Coatings
  - Materials Selection
  - Cathodic Protection

¹- MATERIALS PERFORMANCE MAGAZINE
Essential Elements of a Successful Corrosion Management Program
And it’s Role in the Asset Integrity Management of a Corrosion Control Program
## Management System Domains

- **Policy**
- **Accountability**
- **Communication**
- **Stakeholder Integration**
- **Resources**
- **CM Practice Integration**
- **Performance Measures**
- **Organization**
- **Culture & Knowledge Mgmt**
- **Continuous Improvement**

<table>
<thead>
<tr>
<th>Domain</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>POL</strong></td>
<td>Policies, associated strategies, and objectives to address business needs (including regulatory, legal, environmental, and societal)</td>
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<tr>
<td><strong>STA</strong></td>
<td>Alignment to stakeholder needs, performance monitoring, and compliance</td>
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<tr>
<td><strong>ORG</strong></td>
<td>Structure, interaction model and internal/external engagement (vendors/suppliers)</td>
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<tr>
<td><strong>ACT</strong></td>
<td>Roles, responsibilities, and resource allocation</td>
</tr>
<tr>
<td><strong>RES</strong></td>
<td>Competencies, training and development, and formalization of job and work requirements</td>
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<tr>
<td><strong>CMK</strong></td>
<td>Knowledge capture and transfer, lessons learned, content management, sharing culture</td>
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<tr>
<td><strong>COM</strong></td>
<td>Awareness, knowledge management, and lessons learned</td>
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<tr>
<td><strong>CMIP</strong></td>
<td>Integration into work processes, alignment to quality and other disciplines, and incident tracking/resolution</td>
</tr>
<tr>
<td><strong>PER</strong></td>
<td>Quantifiable indication, such as Key Performance Indicators (KPIs) to assess and to measure how well an organization or individual is achieving desired goals</td>
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Process Classification Framework

PCF creates a common language by outlining all of the processes practiced, categorizing them, and aligning them according to a hierarchical numbering system.

- Tool to support benchmarking, manage content, and perform other important performance management activities
- Used to overcome challenges in organizational alignment, governance, and implementation
- Designed as a framework and global standard to be customized for use in any organization
- Represents major processes and sub-processes, not functions
The VALUE Proposition...

- Integrated platform for corrosion management professionals who desire to move their company to higher levels of performance
- A common language and structure needed to ensure communication throughout all levels of an organization
- Easy way for organizations to identify gaps in processes that could lead to the reduced lifecycle of assets
- The CMMM creates a roadmap of strategies, investments and best practices that lead to higher performance