Performance-Based Environmental Management Systems - Moving Beyond Compliance

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Environmental Management System (EMS) Observations – Why the Cynicism?

- In 2003 over 66K total certifications had been issued in over 113 economies*
- Several studies have shown that the EMSs alone “can” drive performance
- Needs to energize and sophisticate within an organization
  - Add business value and alignment
  - Prioritize and anticipate “real” risks


A Challenge

- Why are Industrial Hygienists well suited to drive performance in to existing or new MS?
- Do you see opportunities in your organization to drive this performance today? If not what could be a strategy to begin?

Best Practice in Environmental Management

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Environmental Management System - Fundamentals

- Manage all critical environmental risks and opportunities in the spirit of continual improvement
- A management system should prioritize resources and drive decisions within the organization
- Management systems should focus changing the behavior of management and operators
Why Environmental Management?

- The source of pressure on organizations (Threats)
- Access to market
- Reduced costs from increased process efficiency
- Improve PR - Branding and market recognition
- Intangibles: attracting and retaining talent, better educated labor force, improved local community relations etc.

EMS – typical wider business benefits

- Reducing reputation and operating risk and getting ahead of legislative and regulatory change
- Access to market
- Intangibles: attracting and retaining talent, better educated labor force, improved local community relations etc.

However, currently...

- Many organizations see ISO14001 as a badge on the wall
- Quick and cheap approach often leads to costly and bureaucratic system
- Increasing concern that EMS not bringing about real performance improvement...

Number of ISO 14001 certificates across the globe

- October 2004
- Total: 74,004

Certification vs. Performance

- ISO 14001 certification in itself is a poor indicator of environmental performance
- Recent studies show that organizations can achieve registration with no noticeable improvement in performance...
  - University of Sussex, SPRU study of 430 sites concluded that "...sites with a certified environmental management system did not appear to perform better than those without."
  - UK Environmental Agency / Policy Studies Institute (PSI) study of 843 sites found "...no evidence exists that externally validated EMS leads to direct improvements in outcomes."
  - An ENDS survey found that one third of companies with ISO 14001 admitted that it did not deliver performance improvement
  - REMAS, Industrial Research Institutes in Sweden, AIHA Journal Dec 2003, University of North Carolina...
Certification vs. Performance (cont.)

- What do we learn from this:
- Obtaining ISO 14001 certification should not be the strategic focus of an organization implementing an EMS.
- The objective of an EMS is to improve environmental performance and manage environmental and associated risks.

How can we change?

- No one-size-fits all solution.
- EMS needs to be based on how the business works and is structured, not the structure of the ISO 14001 standard.
- Develop strategic objectives for the EMS – link to business goals.
- Establish design criteria for your EMS – is ISO14001 adequate?
- Engagement of management and employees – behavioral change is key.

Characteristics of a Performance-based EMS (1)

- Simple and flexible.
- Minimal documentation and bureaucracy.
- Seen as an integral part of the business.
- Transparency – of system and performance, internally and externally.
- Engages staff from across the organization.
- Delivers a mechanism for two way communication, internally and externally.
- Integration with other management systems.

Characteristics of a Performance-based EMS (2)

- Encourages innovative solutions.
- Driven by senior management.
- Enables effective prioritization of resources.
- Designates responsibility and accountability across the organization.
- Establishes environmental goals that are clearly linked to broader business objectives.
- Rewards behavior that deliver performance.

How do you implement an performance-focused EMS

- Organizational change required:
  - Embedding good environmental management practices into core operations.
  - Integrating EMS into decision-making processes.
- This may be achieved through:
  - The commitment and active endorsement of management at all levels.
  - Selecting the right consultant and registration body.
  - The engagement of those working for and on behalf of the organization.
  - Integration into existing roles and responsibilities, and systems and processes in the organization (not a separate activity).

Developing a Performance-based EMS

- The key elements…
Key Elements

- Convince Senior Management of the need
  - Clear Strategy, linked to Organizational Goals and Strategy
- Establish Structure and Responsibilities
  - Organize and train cross-functional team
  - Cross-organizational engagement (not just EHS Dept)
- 'Aspects Analysis'
  - Include wider business issues in evaluation of significance
- Objectives and targets and Action Plans
  - Drive performance improvement
  - Establish cross-organisational targets: buy-in / engagement key
- Legal Requirements
  - Interpret into clear compliance actions

Key Elements (cont.)

- Create efficient EMS infrastructure and tools
  - e.g., audit database, management system documentation
- Training and Communication
  - Key to engaging workforce and ensuring action
- Monitoring and Measurement
  - Set clear KPIs and monitor performance against targets
  - Link performance against KPIs to remuneration
- Auditing
  - Develop internal audit process to focus on performance - need trained auditors
  - Focus on Conformance, Education and Sharing of Best Practice
- Stakeholder Engagement
  - Understand needs and requirements
  - Involve in decisions and communicate

Case Study Examples

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Significance</th>
<th>Evaluation Criteria</th>
<th>Impact</th>
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Structure

Objectives and Targets

- To reduce the amount of waste we produce going to landfill
- To establish a baseline of waste production from construction sites
- To reduce the occurrence of air, water and land pollution incidents
- To establish a baseline of carbon dioxide emissions from permanent locations and trial measurement of carbon dioxide emissions from construction operations
- To improve environmental awareness of employees
- To ensure each construction site has a suitably trained environmental supervisor
Communication and Training

Environmental Training
Target: 90% Penetration in FY04

Key Performance Indicators

Operational Controls - Purchasing

Engaging the workforce and local community
Ashay Ajgaonkar
Case Study – Applied Materials
We Make the Systems Used to Produce Virtually Every New Microchip in the World

Applied Materials

Environmental Stakeholder Forum History

- Applied Materials sponsored 2 successful Environmental Stakeholder Forums at our Austin Facility in:
  - September 2004
  - February 2005
  - Next Forum: Spring 2006

- Engaging and value added process.

The Stakeholder Process

1. Purpose and Objectives
   - Purpose
     - Share Applied’s business operations with the community
     - Discuss environmental concerns of the community
   - Objectives
     - Utilize the Stakeholder Forum to provide an informal venue to discuss environmental issues.
     - Educate stakeholders on Applied’ efforts to manage environmental concerns and minimize the ecological footprint.
     - Develop a better understanding of the Communities’ environmental expectations, as a corporate citizen.
     - Forge relationships with community stakeholders to maintain open lines of communication.

2. Stakeholder Identification
   - Desired Stakeholders:
     - Local neighborhood community organizations;
     - City Council members
     - Environmental action organizations;
     - Local businesses;
     - Austin area media representatives;
     - Area school leadership; and
     - City of Austin leadership.
   - Goal: to ensure cross-section of community groups given opportunity to exchange ideas.

3. Stakeholder Coordination
   - A Group Effort:
     - Environmental, Health and Safety;
     - Community Affairs;
     - Product Business Groups;
     - Executive Management; and
     - Consultants
   - Aim to present the many faces of Applied Materials, illustrating engagement outside of the EHS Department.

4. Forum Agenda
   - Company Overview
   - Site Tour
   - Facilitated Feedback Sessions

5. Feedback / Post-Event Communication
Facilitated Feedback Session
- Feedback sessions allowed for small group discussions on the following pre-drafted questions.
  1. What are the most important environmental issues facing our region?
  2. Which environmental initiatives would you like us to expand or develop?
  3. How should we measure and communicate our environmental process?
  4. What is the most effective way for businesses and community members to collaborate on delivering environmental improvements for the region?
- Groups were then encouraged to voice aloud their comments/concerns.

Results / Benefits
- Approximately 22 community members present, representing 16 different local community groups
- The attendees stated that they had a better opinion of Applied’s business operations following the forum.
  - Stakeholder Quote: “seeing your environmental goals and status was excellent”
- Enhanced reputation amongst local community members
- Stakeholders provided recommendations and ideas for continual environmental improvement
- Community stakeholder needs and their perceptions of our business is now better understood.
- Provides justification for EHS and broader corporate responsibility program internally???

Feedback / Post Event Communication
- Actual Stakeholder Concerns:
  - Illegal dumping controls on Applied Material
  - Monitoring landfill stormwater releases
  - Transportation and air quality
  - Rainwater harvesting
  - Participation in Green Choice
- Many of these issues have been addressed or will be addressed via meeting minutes or at future stakeholder meetings.

Performance-based Auditing
Ashay Ajgaonkar
Case Study – Applied Materials

Objectives
- What is performance-based EMS Audit?
- Why did we choose this approach?
- How did we sell this approach to management?
- What were our results?
What is Performance-based EMS Auditing?

- A method of auditing that assesses management and employee behaviors in driving environmental outcomes rather than focusing on documentation.
- An approach which can be applied to different audit focus areas, (i.e., environmental, safety, quality)
  - This approach assesses what employees are actually doing to implement programs and minimize impacts, rather than what they are supposed to be doing in the site program documentation.
  - Used successfully, performance-based auditing drills down to understand why practices/actions are occurring.

Auditors should act as investors, not ISO 14001 regulators

Move away from ‘Gotcha’ mentality

Why did we choose this approach?

- Companies were showing negative correlation with environmental Non-Conformances (NCs) and EMS certified to ISO 14001
- Poor experience with ISO 9001 (QMS) efforts had scared the site into loads of unused documentation
- Wanted to justify Return-On-Investment (ROI) to senior management with performance benefits
- Wanted to add value to our environmental programs
- Benchmarking with other companies showed no “real” benefit with traditional ISO auditing efforts using the “check the box” approach for environmental compliance
- Wanted to develop a world-class EMS in line with our OSHA VPP safety program and certify to the National Leader / NEPT program.

How Did We Sell Approach to Management?

- When company has an existing documentation-based QMS, it is very challenging to go “against the grain” and choose a performance-based auditor.
- Culture of such companies is to produce lots of procedures and check off boxes to the standard to pass the audit.
- Management was initially opposed to using a non-QMS auditor, but agreed for the Pre-Audit.
  - Realizing the challenges, EHS worked closely with our auditor, ERMCVS, and conducted a Pre-Audit.
  - The Pre-Audit was successful in raising senior senior management’s attention in understanding environmental issues.

Results – Performance Improvement

- The site yielded $450K of cost savings in the first year of the EMS.
- The payback period on the project was 10 months.
- The cost savings are tangible benefits and do not include risk avoidance.
Our Results from This Approach

- By working closely with Austin Energy, Applied reduced energy consumption at the Austin site in CY2004 by 5.5% (approx. 5,289,042 KWh), compared to CY2003 energy use.
- By teaming with the City of Austin’s Water Conservation Program, Applied recycled 11 million gallons of water in FY 2004.
- Applied joined the Clean Air Force’s, Clean Air Partners Program, and made significant changes which resulted in a 12% reduction of harmful ozone emissions (volatile organic compounds and nitrous oxides), compared to 2003.
- Applied’s aggressive waste management programs have resulted in a landfill diversion rate of 83% in FY 2004 (a 40% decrease in tons sent to landfill).

EMS Performance Benefits

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<tr>
<th>Target</th>
<th>2004 Goal</th>
<th>2004 Actual</th>
<th>Cost Savings</th>
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<tbody>
<tr>
<td>Reduce solid waste sent to the landfill by 15% by end of 2004</td>
<td>8.76 tons per system (5% reduction from 2003 baseline)</td>
<td>0.88 tons per system (48% reduction)</td>
<td>$35,000</td>
</tr>
<tr>
<td>Reduce hazardous waste generated by 35% by the end of 2006</td>
<td>21 pounds per system (15% reduction from 2000 baseline)</td>
<td>18 pounds per system (27% reduction)</td>
<td>$10,000</td>
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<tr>
<td>Reduce annual energy usage by 5% by the end of 2006</td>
<td>96,218,002 KWh used (3% reduction from 2003 usage)</td>
<td>96,930,900 KWh used (5.5% Reduction)</td>
<td>$181,000</td>
</tr>
<tr>
<td>Recycle 7 million gallons of water in FY 2004</td>
<td>7.8 million gallons recycled</td>
<td>11.8 million gallons recycled</td>
<td>$85,000</td>
</tr>
<tr>
<td>Reduce air emissions by 10% by the end of 2006</td>
<td>50 commuter equivalents (13% reduction)</td>
<td>335 Commuter Credits (12% reduction)</td>
<td>NA</td>
</tr>
<tr>
<td>90% of intermediaries in environmental awareness by end of 2006</td>
<td>90% Trained</td>
<td>91% Trained</td>
<td>NA</td>
</tr>
<tr>
<td>Engage community through sponsored environmental forums</td>
<td>1 Person</td>
<td>1 Person</td>
<td>NA</td>
</tr>
<tr>
<td>Assess supplier environmental performance and compliance (portion of supplier auditors trained on EHS auditing)</td>
<td>50% Trained</td>
<td>68% Trained</td>
<td>NA</td>
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<tr>
<td>Maintain legal compliance</td>
<td>0 NOVs</td>
<td>0 NOVs</td>
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Other Benefits of EMS

- ISO 14001 registration
- Texas Commission on Environmental Quality – National Leader
  – Reduced inspection frequency
  – Faster permitting
  – Other negotiable incentives
- EPA – National Environmental Performance Track
- Improved stakeholder relationships

Closing Remarks

- Further questions should be directed to:
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- Additional information available: www.appliedmaterials.com

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