

Siemens VDO Automotive

Newport News, Va



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EMS Overview



Alan Bennett, EH&S Team Leader



Outline

- Introduction to Siemens VDO Automotive and its culture
- State of The Business
- Overview of Environmental Programs Before E3
- Why We Chose to Implement an EMS
- EMS Primer – Key Components
- Results / Benefits
- EMS Options
- Summary

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Meet Siemens VDO Automotive Corporation

Designs, develops, manufactures, and markets fuel system components to major automobile companies around the world.



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Meet Siemens VDO Automotive Corporation



Electronic fuel injectors are an enabling technology to improve fuel economy and reduce pollution from mobile sources worldwide.



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Meet Siemens VDO Automotive Corporation

Our Newport News facility manufactures over 75,000 Deka[®] fuel injectors per day for sale to major auto makers in North America, Europe, and Asia. To date, over 220 million Deka[®] injectors are used worldwide.



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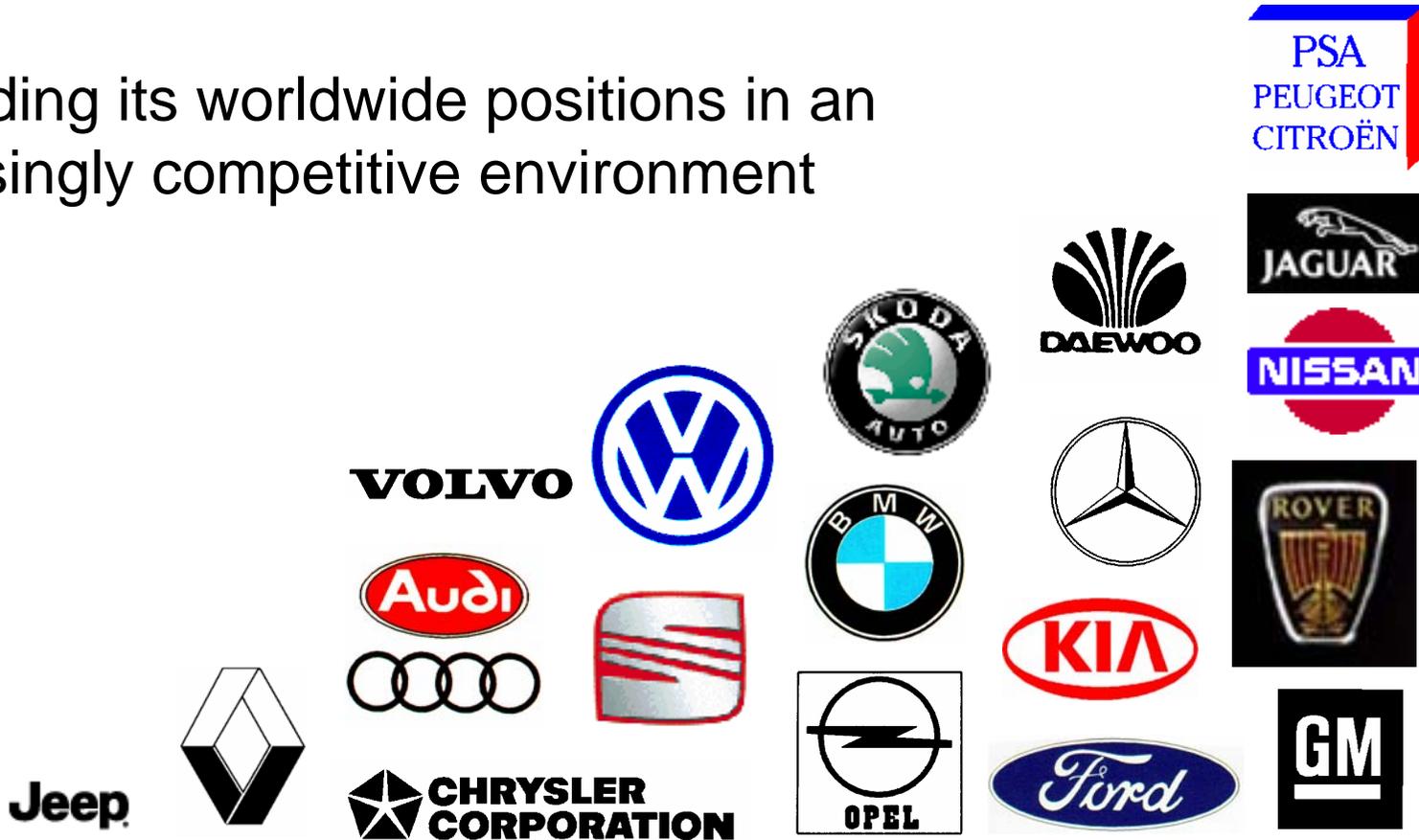


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Meet Siemens VDO Automotive Corporation

Expanding its worldwide positions in an increasingly competitive environment



Meet Siemens VDO Automotive Corporation

*“Management by compliance
is like quality by inspection”*

(Author Unknown)

We cannot “inspect in” quality.

- 75,000 injectors made daily
- Customer return rates = less than 5 ppm

We cannot achieve environmental excellence by focusing solely on compliance and “command and control” approaches.



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Corporate Culture

From Siemens VDO's Mission Statement:

"We are committed to conserving the environment and treating natural resources with care and respect. This applies as much to our production processes as to our products. The assessment of the environmental effects of our products begins as early as the development stage." This is evidenced by:

ISO 14001 certification (January 2001)

Exemplary Environmental Enterprise (Virginia Environmental Excellence Program, March 2001)



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Corporate Culture

Environmental Policy

It is our policy to manufacture quality products that meet or exceed customer expectations while minimizing impacts to the environment. We will not knowingly permit any person, or the environment, to be harmed by our actions or our products.

Accordingly, we will ensure regulatory compliance and seek continual improvements in the use of natural resources and prevention of pollution.

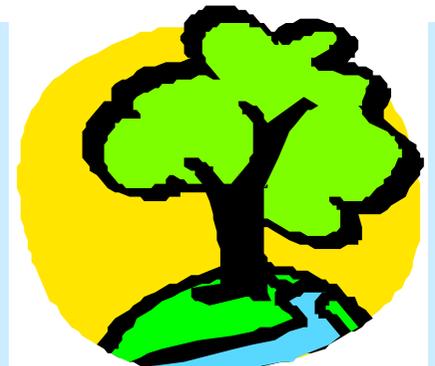
Endorsed by the entire management team



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State of the Business

- Number 1 in injector market share in Europe
- Number 2 worldwide
- SV: # 1 in worldwide injector market share by 2005
- 1988: Dekal 1996: Dekal IV 2003: Dekal VII
- But...
 - Customers expect quality and performance
 - We compete on price, viewed as a commodity
 - DCX cuts our prices 6 % annually
 - We must cut our product costs by half every 5 years to compete
- Zero tolerance for inefficiency
- Less than 12 month payback required for projects



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Environmental Programs Before E3

- Roles and responsibilities established through a routine that's ingrained in the culture (note: this routine may need to be broken later for an E3-based EMS).
- A compliance history had been established
- Reliance on a few competent individuals for EH&S, and, setting goals and objectives
- Recycling programs are very mature
- EH&S has niche in product and process change review, but not consistent and typically late in the game
- Sustainability is starting to receive emphasis

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Environmental Programs Before E3

- Shop floor personnel have *at least* a cursory knowledge of the EH&S rules that govern their work
- The company knows how to generate good will with the public and regulatory community
- Management has voiced support of environmental issues [to the EH&S team, at least]
- Most “low hanging fruit” in P2 have been picked
- Diminishing return on investment in P2
- Even prior to E3, SV had achieved some remarkable successes by designing environmentally-compatible products and processes (this will prove to be the core of our future EMS)

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Environmentally Compatible Product & Process Design

Question: *Why is it Important?*

Answer:

- Approx. 70% of production costs and up to 95% of EH&S costs are determined in the design phase
- Process inputs, such as raw materials, energy requirements, lubricants and solvents, are determined
- Process outputs (desirable & undesirable) are determined
- Pre-EMS, only injectors received attention
- Product Development and Launch Procedure is a 5-Phase process, with EH&S sign-off at each stage
- 2003: all products are now included in the PD&L

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Environmentally Compatible Product & Process Design

Before



Deka® I

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After



Deka®

IV & VII

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Environmentally Compatible Product & Process Design



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1988 - Present:

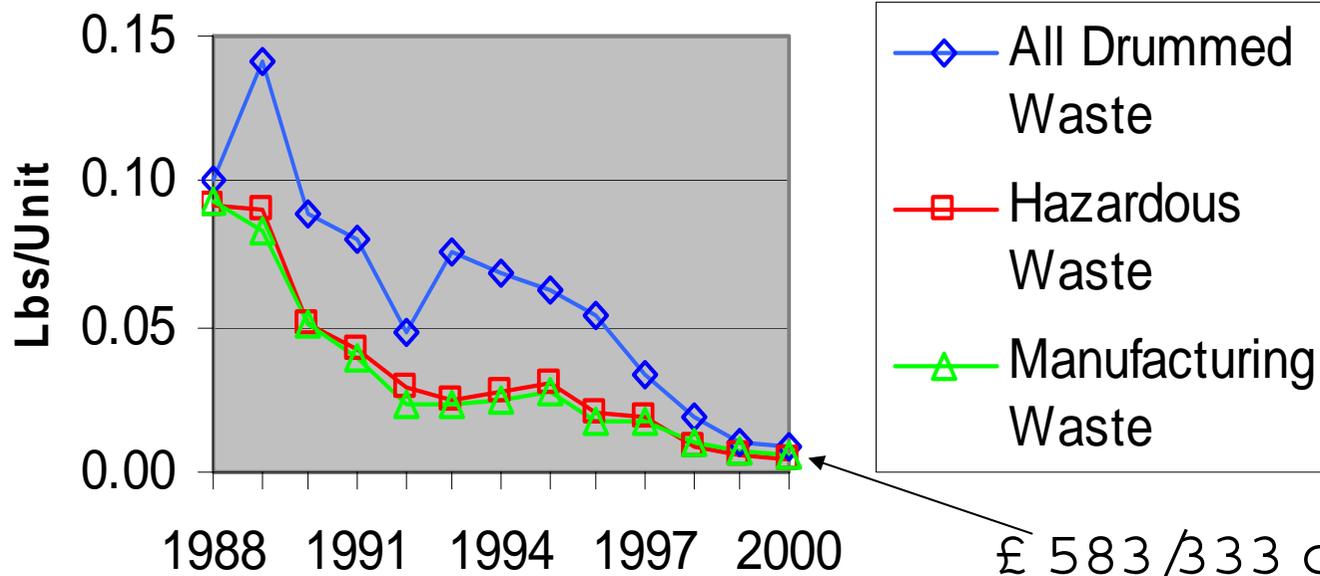
While production volume increased more than 1100%:

- Disposal of manufacturing-related hazardous waste per product produced decreased 92%.
- Disposal of all manufacturing-related waste per product produced decreased 90%.
- Total VOC emissions per product produced decreased 75%.
- Trends: reveal successes & opportunities



Environmentally Compatible Product & Process Design

**Lbs Generated/Unit Sold
(Manufacturing-related Waste)**



£ 583 / 333 ¢ v

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Recycling Results: Good or Bad?

<u>2002 Results:</u>	<u>Pounds</u>
Metal Chips	1,652,020
Metal Scrap	388,740
Cardboard	41,950
Brass	42,097
Safety Kleen	28,743
Nylon Plastic	64,115
Paper (all grades)	9,620
Aluminum Cans	2,980
Miscellaneous Wood	250,600
Pallets Recovered & Reused	75,820
Wooden Bar Stock Boxes	56,840
	<u>2,613,525</u>

Cost Avoidance: Approx. \$125,000

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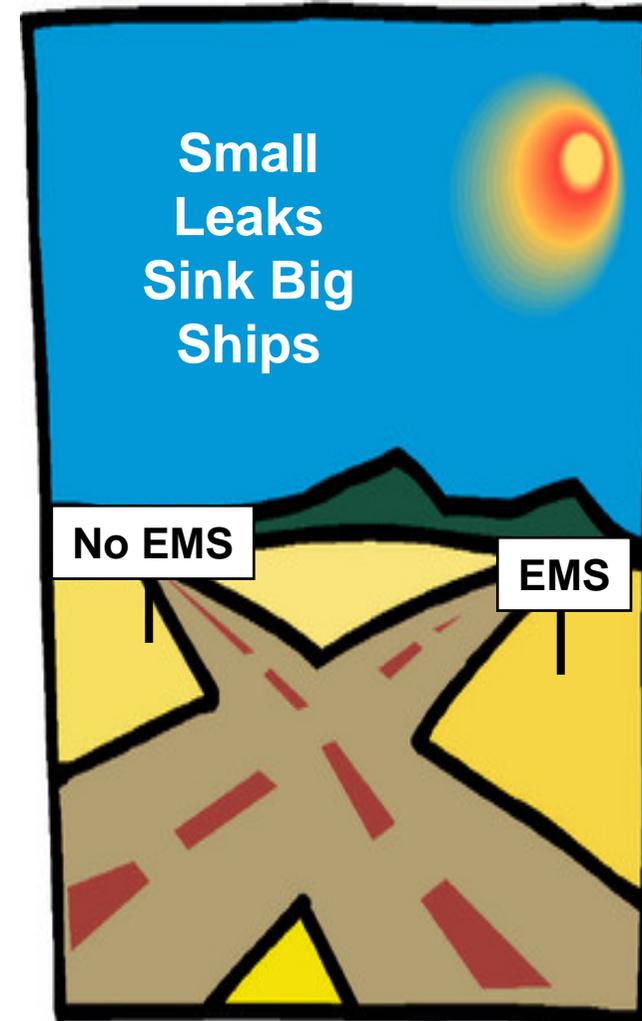


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At The Crossroads

- Diminishing returns on investment
- But, clearly there are opportunities, based on remaining volumes of waste
 - 250,000 lbs per year (NHW + HW)
 - 2.5 million pounds recycled
- Where are the remaining opportunities that satisfy our rigorous economic hurdles?
 - Payback of <12 months
 - No additional headcount
 - EVA of > 10%
- Decision made to implement an ISO14001-based EMS



Why Implement an EMS ?

- You have plenty of resources in EHS, right?
- Who acts as the enforcer of discipline?
- How many repeat non-conformances do you have?
- Are you in compliance with your training matrix? (does not mean "do you have a training matrix?")
- Who does management look at to find out if the plant is in compliance or if a problem has been fixed?
- Who sets the goals for environmental management?
- Do you understand the *total cost* of EH&S
- Is EH&S a cultural value, or a priority?
- A new culture that includes EH&S, and where EH&S is part of the routine and not considered a "priority"



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EMS Primer – Key Components (Per E3)

- Environmental Policy statement
- Identification of **impacts to the environment**
- Objectives, targets and procedures for addressing them
- **Pollution prevention program**, including its achievements, objectives and goals
- Identification of **legal requirements** and changes
- Documented **roles, responsibilities and authorities**
- Procedures for **reporting and record keeping**
- Procedures for ensuring that employees have the necessary **training**

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EMS Primer – Key Components (Per the E3)

- **Emergency response procedures** for responding to, reporting, mitigating and reviewing incidents
- Management of EMS **corrective actions**
- **Voluntary self assessments** (external or internal auditing system)
- Procedures to **communicate (external and internal)**
- **And....**
- A **record of significant compliance** with environmental laws and environmental requirements

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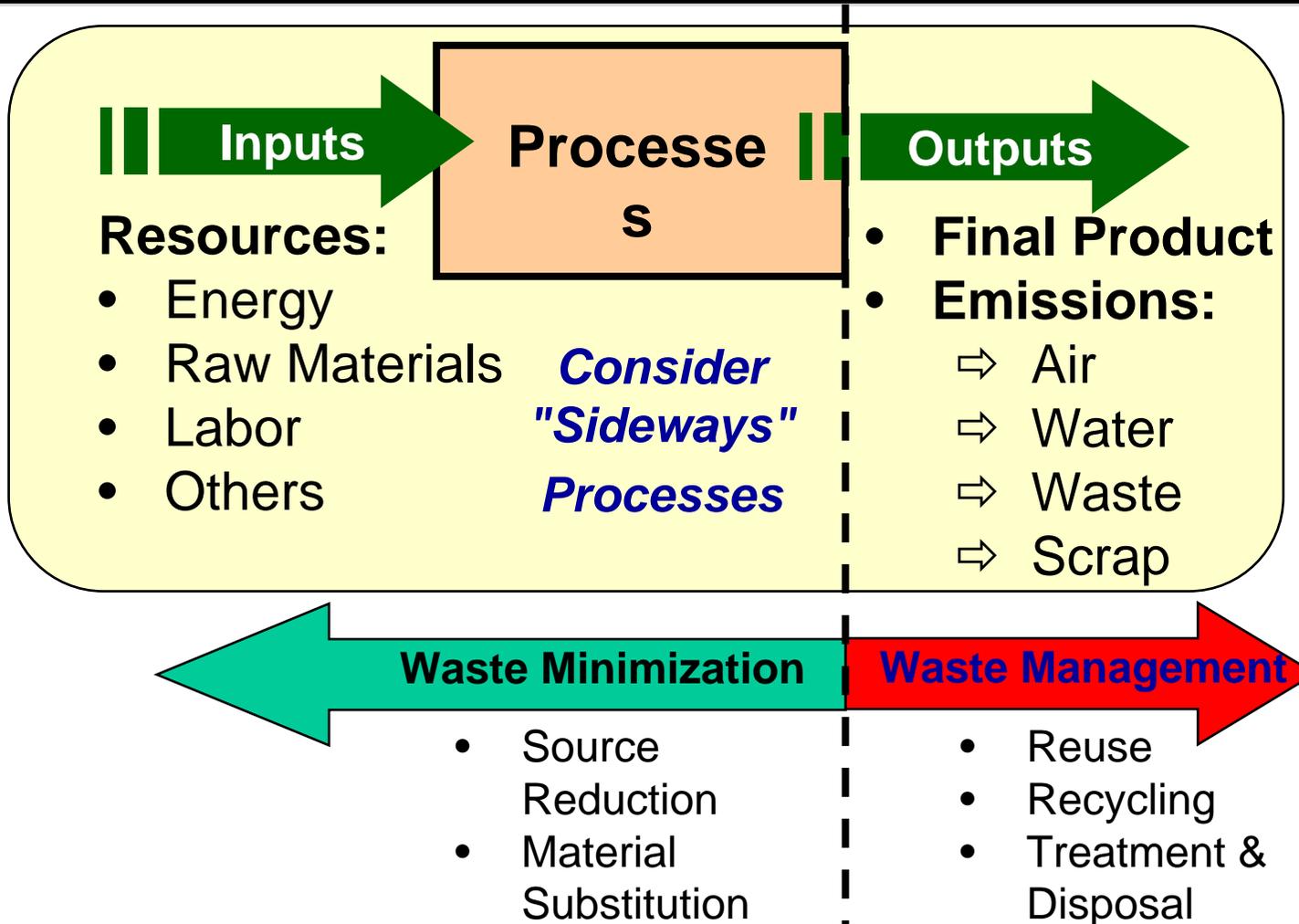
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P2 and Self Assessments (*ISO – E3 mentality*)



Q: Where can you relieve your regulatory burden and operating cost?

A: Usually, it's only possible on the left side: material substitution and product and process design changes

EHS Culture: Did you forget your Pants?

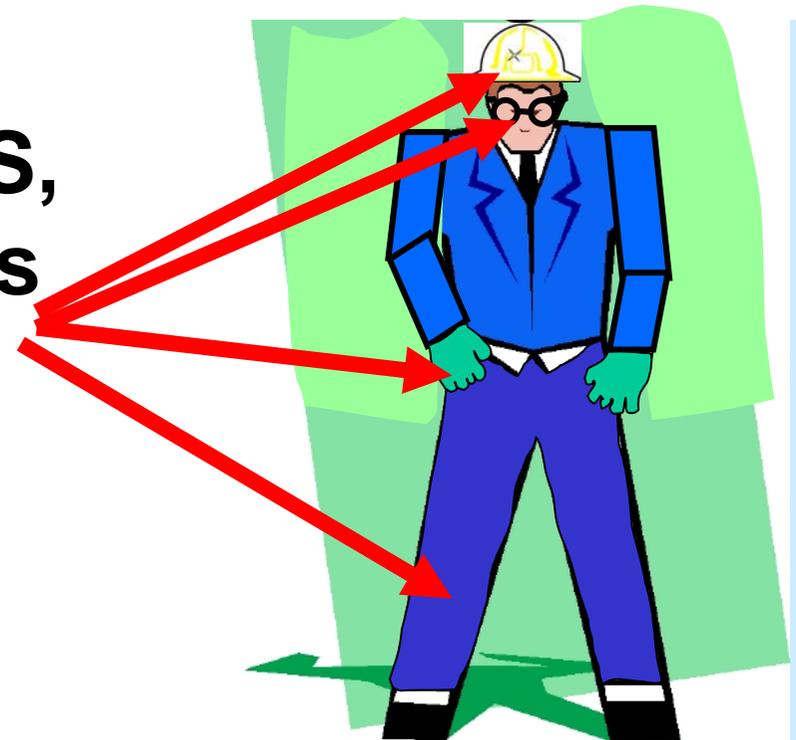
- **What gets sacrificed when priorities change?**
- **Priority:** *n.* a) a right to precedence over others
- Priorities are subject to daily demands. What short-cuts do you take when you are in a hurry?
 - *How you do dispose of your waste?*
 - *Do you take the time to put on your PPE?*
- EH&S must be part of our culture, not a "priority"
- **Culture:** *n.* a) the set of shared attitudes, values, goals, and practices that characterizes a company
- **EH&S MUST become part of our "Daily Routine" and lives**
 - ⇒ ***Like putting on our pants in the morning.***



EHS Culture: Did you forget your Pants?



**A Culture Where EH&S,
Like Pants, Is Always
"Routine"**





E3 Results

- Implemented several EMS objectives:
 - Baled plastic overmold scrap onsite instead of grinding offsite: \$35,000 in year 1, \$10k thereafter
 - Redirected landfill waste stream to NASA steam plant, saved approx. \$7,500 in year 1
 - Eliminated disposable clean room lab coats, saved approx. \$25k in year 1
 - Implemented pallet reuse program, saved approx. \$25k in year 1
 - Implementing a reusable absorbent pad project, should save \$12k minimum
 - Elimination of calibration fluid for regulator lines calibration, \$20k to implement:
 - Cost Savings FY03: \$49,450
 - Cost Savings FY04: \$89,782
 - Cost Savings FY05: \$104,681

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E3 Results (Continued)

- Complete integration into formal product development and launch process for all products
- Enhanced partnership with VDEQ, and some regulatory relief
- Production Team goal development
- Active employee-based EHS teams, run by hourly personnel
- Production Team self-audits
- EHS objectives into Management performance dialogues
- It's about relationships, not rules and regulations
- Desire, not duty to obey
- Working on cultural change and new measuring tools

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Monthly Operating Results Meetings

Old School Metrics?



MONTHLY OPERATING RESULTS

Newport News and Pisa



MARCH 2002 * NPN * NPN MOR

** Results for February 2002 **

Status not yet reported
 Goal met
 YTD Avg Goal Met but Not Last Month
 Goal not met
 No goal

CUSTOMER SATISFACTION

- 1 Customer Quality Audit Results
- 2 Third Party Quality Audits
- 3 Internal Quality Audits
- 4 Customer Satisfaction (by Qtr)
- 5 Visitor Evaluation (by Qtr)

DELIVERY PERFORMANCE

- 6 Premium Freight to Customers
- 7 Premium Freight from Suppliers
- 8 Supplier Delivery Performance
- 9 On Time Delivery to Customers
- 10A Cust Samp Deliv Perf-Rail
- 10B Cust Samp Deliv Perf-Reg
- 10C Cust Samp Deliv Perf-Inj D1
- 10D Cust Samp Deliv Perf-Inj D4
- 10E Cust Samp Deliv Perf-Inj D7

DELIVERED QUALITY

- 11A Factory Field PPM (Deka I)
- 11B Factory Field PPM (Deka IV)
- 11C Factory Field PPM (HPDI)
- 11D Factory Field PPM (Reid)

ENVIRONMENT, HEALTH & SAFETY

- 13A Housekeeping (by Qtr)
- 13B Lost Time Injuries
- 13C OSHA Recordables

EMS Metrics

- 14A EH&S Findings
- 14B Air Emissions
- 14C Energy Conservation
- 14D Waste Minimization

INVENTORY

- 15 Active Inventory

PRODUCTIVITY

- 16A-1 Components-Grind Side
- 16A-2 Components-Screw Machine
- 16B Fuel Rails
- 16C Regulators
- 16D HPDI
- 16E Injectors

SUPPLIER QUALITY

- 17 Supplier Resp. Rejection
- 18 *reserved for future use*
- 19 Reduced Insp. Status
- 20 Supplier Ratings
- 21 Overall Supplier PPM

IN-HOUSE QUALITY

- 22 CPK/PPK (by Qtr)
- 23 Cost of Quality

Scrap \$\$

- 24B Fuel Rails
- 24C Regulators
- 24D HPDI
- 24E-1 Injectors - Deka I
- 24E-2 =Injectors - Deka IV

Scrap \$\$ - Components

- 24A-1 Tot Scrap %-Grind
- 24A-1A Tot Scrap %-Screw
- 24A-2 Tot Burd Scrap \$-Gr



Measures of Continuous Improvement: A new way of looking at things

Lagging Indicators

Incidents

- Accident, Injury, and Incident Rates
- Emissions Rates
- NOV's
- Spills

Leading Indicators

Work Practices

- Observations
- Lessons Learned
- Feedback Loops
- Behavior-based Safety

Operating Conditions

- Inspections / Audits
- Risk Assessments
- Hazard Prevention & Control
- Job Safety Analysis

Business Systems

- Rules / Procedures
- Training & Awareness
- Disciplinary Systems
- Incident Investigation / Closure Rates
- Mgmt Objectives

Culture & Attitudes

- Perception Surveys

You cannot improve a system by measuring its failures

Effective Systems to Communicate



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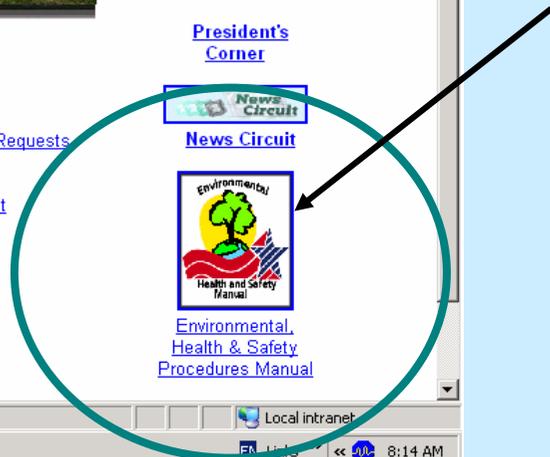
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Hyperlink to EH&S Procedures

"How do you know what to do?"



Focus on Preventive Action

- Goal: avoid “quick-fixes”
- Otherwise, you will have similar findings year-in and year-out
- For every corrective action, you should have a preventive action
- Ensure that auditing tools assist in “preventive action” mentality not just corrective actions



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ENVIRONMENTAL OBJECTIVES AND TARGETS
Calendar Year 2003



Location: Newport News, Virginia

Objective	Responsible Person(s)	Action Plans	Target Completion Date	Complete
Objective: Convert Pressure Regulator lines to compressed air Target: 10/31/04	K. Francis	Conduct pilot on Flex2 line	10/31/04	Complete
		Evaluate results		Complete
		Develop plan to expand program		Complete
		Obtain customer approvals		In progress
		Retrofit remaining lines		In progress
Objective: Reduce absorbent pad consumption Target: 1) Evaluate by August 31, 2003 2) Establish reduction goal and timeline	R. Arnette / A. Bennett	Conduct evaluation of usage	12/31/03	Complete
		Educate personnel regarding cost, use and disposal issues		Complete
		Implement improvements		In progress
		Monitor consumption trends		In progress
Objective: Energy Conservation Target: Implement initiatives by 12/31/03	B. Hall / Bob Lehman	Establish list of air leaks by Clean Room	12/31/03	Complete
		Develop plan to address		Complete
		Determine which machines can be shutdown when not in use.		In progress
		Develop procedures to accomplish shutdown and start-up		In progress
Objective: Improve First Pass Yield on L850 Line (assembly and test) and Manual Lines (test only) Target: L850: 96.9% Manual Lines: 98.9%	J. Phillips / S. Quigley	Root Cause Investigation	12/31/03	In progress
		Analyze Data		In progress
		Implement Conclusions		In progress
Objective: Proceduralize how we manage chemical stores inventories Target: 12/31/03	A. Bennett	Documents existing tasks	2/28/04	In progress
		Make improvements		In progress
		Implement recommendations		In progress

Funding has been allocated to assist with the completion of the Objectives and Targets.

For further information about the Objectives and Targets Program, or to discuss new ideas, please contact Alan Bennett at x6724

EMS Options

- Implement ISO 14001
 - Self Certify (least credible option)
 - 3rd party registration (most credible)
 - 3rd party ISO 14001 registration can be expensive
 - SV pays \$5,000 – 7,500 per year
 - Depends on size of facility and # of shifts
 - Headcount
- In the automotive industry, ISO 14001 is now mandatory
- Exemplary Environmental Enterprise (E3)
 - Modeled after ISO 14001
 - No 3rd party costs
 - Credibility of 3rd party review and registration

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Relative Benefits (External)

- ISO 14001
 - You get to do business in the Automotive industry
 - Shareholder and customer goodwill
 - Dow Jones Green Index, etc.
- Exemplary Environmental Enterprise (E3)
 - Much publicity via VDEQ
 - Potential regulatory relief:
 - Warnings vice NOV
 - Fewer unannounced inspections
 - Favorable interpretations

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